



21° CONGRESSO
dell'Associazione Antropologica Italiana

***Towards a Next-Generation Anthropology:
challenges & synergies***

**Bologna and Ravenna
September 3-5, 2015**

CONFERENCE HOSTS

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XXI Congress of the Italian Anthropological Association

Towards a Next-Generation Anthropology: challenges & synergies

Bologna and Ravenna, September 3-5, 2015

The Department of Biological Geological & Environmental Sciences and the Department of Cultural Heritage of the University of Bologna are pleased to host the XXI Congress of the Italian Anthropological Association that will be held in Bologna and Ravenna (Italy) from September 3 to September 5, 2015.

The Congress plans to represent an important opportunity for non-professional and professional Anthropologists, and especially for PhD students, post-docs, young researchers and lecturers, to present their studies. All participants are invited to exchange ideas and expertise with each other and with distinguished senior researchers on most of the topics, the state of the art and the future in the field of Evolutionary Anthropology.

As the Organizing & Scientific Committee, we are very grateful to the many people involved in the organization of the Congress and to our invited speakers for their kindly agreeing to participate to this event.

Giorgio Gruppioni & Donata Luiselli (Organizers)

The Italian Anthropological Association board (Scientific Committee)

Practical information about the Congress

The Congress is organized into four Symposia and two Round Tables that will be distributed in two venues in the Bologna and Ravenna University Areas, which are within the old town centers of these cities.

In particular, the Symposium I (*New Frontiers in Evolutionary Anthropology*) is co-hosted with the Italian Society for Evolutionary Biology (SIBE) and represents also the last symposium of the VI SIBE Congress being aimed at displaying case studies representative of innovative approaches for the study of human evolution.

In the first two days (September 3-4, 2015), Oral Presentations will be held at the *Complesso Aule Belmeloro, Room A* (14, Belmeloro, Bologna), while Lunch and Poster Sessions will be organized at the *Department of Biological Geological & Environmental Sciences, 1 floor* (3, Selmi, Bologna).

During the afternoon of September 4, the Congress will move to Ravenna where it is scheduled the Conference Dinner at the *Ca' de Vèn* restaurant (24, Corrado Ricci, Ravenna, www.cadeven.it) and where Oral Presentations and the Congress Concluding Remarks will be held at the *Department of Cultural Heritage, Conference Room* (1, degli Ariani, Ravenna).

In addition to 31 Oral Presentations, also 27 Flash Talks selected among the received posters will be scheduled.

You will find the updated Congress Programme at the <http://www.bioanthropologybologna.eu/programme/sa999a4d0> web page.

Moreover, you will find all information for Poster Hanging, Delivery of the Slides for your talk, Certificate of Participation, Wi-fi Connection and Coffee Breaks at the Registration Desk.

CONFERENCE PROGRAMME

SEPTEMBER 3 (Complesso Belmeloro, Room A - 14, Belmeloro, Bologna)	
08:15	Registration & Poster hanging
09:00	Welcome
09:30	Symposium I: Keynote Lecture HOW WE SETTLED THE WORLD AND DEVELOPED OUR CULTURE Eske Willerslev
10:30	EARLY MODERN HUMAN DISPERSAL FROM AFRICA: GENOMIC EVIDENCE FOR MULTIPLE WAVES OF MIGRATION Tassi F., Ghiretto S., Mezzavilla M., Torres Vilaça S., De Santi L., Barbujani G.
10:45	IDENTIFICATION OF MISSING CHILDREN: A QUANTITATIVE APPROACH TO THE ANALYSIS OF FACIAL MORPHOLOGY Gibelli D., Compassi V., Caplovà Z., Giancola S., Sala R., Cattaneo C.
11:00	DISCOVERING PAST GUT MICROBIOMES THROUGH NGS ANALYSIS: THE MUMMIES OF ROCCAPELAGO (MO) Cilli E., De Filippo C., Albanese D., Lugli F., Sordo M., Viola M.F., Traversari M., Catalano G., Serventi P., De Fanti S., Quagliariello A., Labate D., Cipriani A., Luiselli D., Gruppioni G.
11:15	Discussion
11:30	Coffee break
11:45	DNA METHYLATION VARIABILITY ALONG THE ITALIAN PENINSULA: AN EVOLUTIONARY PERSPECTIVE REVEALS IMPLICATIONS FOR HUMAN HEALTH AND DISEASES Giuliani C., Pirazzini C., Bacalini M.G., Sazzini M., Mari D., Passarino G., Franceschi C., Garagnani P., Luiselli D.
12:00	THE SIGNIFICANCE OF MICROFOSSILS RECOVERED FROM DENTAL CALCULUS FOR ANTHROPOLOGICAL ANALYSIS Fiorin E., Malgosa A.
12:15	TESTING FOR THE INFLUENCE OF LIFESTYLE ON GENETIC DIVERSITY THROUGH TIME Leonardi M., Ghiretto S., Tassi F., Manica A., Barbujani G.
12:30	Discussion
12:45	Flash talks: Session I
13:15	Free Lunch & Poster Session

15:15	<p>SKANLAB: A NEW, EFFECTIVE AND LOW COST 3D PROCEDURE FOR THE ESTIMATION OF UPPER-LIMB VOLUME</p> <p>Mereu E., Buffa R., Lussu P., Martella P., Succa V., Marini E.</p>
15:30	<p>IN SITU STRONTIUM ISOTOPE ANALYSIS ON BIOGENIC APATITE: THE USE OF LA-MC-ICPMS IN ANTHROPOLOGICAL RESEARCH</p> <p>Lugli F., Cipriani A., Reghizzi M., Brunelli D., Benazzi S.</p>
15:45	<p>FACES AND IDENTITIES: IS IT POSSIBLE TO MEASURE THE RELIABILITY OF 3D CRANIOFACIAL APPROXIMATIONS?</p> <p>Miccichè R., Di Lorenzo D., Carotenuto G., Lo Bianco S., Valenti P., Sineo L.</p>
16:00	Discussion
16:15	Flash talks: Session II
17:15	Coffee break
17:30	<p>Round Table I</p> <p>LA COSIDDETTA “QUESTIONE DELLA RAZZA” FRA SCIENZA E PREGIUDIZIO: UNA QUESTIONE ATTUALE?</p> <p>Moderatore: Capasso L.</p> <p>Interveranno: Panaino A., Barbujani G., Destro Bisol G., Nicolucci A.</p>
19:00	Conference Cocktail

SEPTEMBER 4
(Complesso Belmeloro, Room A - 14, Belmeloro, Bologna)

09:00	<p>Symposium II: Keynote Lecture</p> <p>ITALIAN DIETS THROUGH TIME: AN OVERVIEW OF RESEARCH METHODS AND THEMES Marcello A. Mannino</p>
10:00	<p>ANCIENT BIOMOLECULES: A NEW APPROACH TO STUDY BIOLOGICAL AND CULTURAL HERITAGE OF THE CENTRAL-SOUTHERN ITALIAN POPULATIONS THROUGH 30K YEARS</p> <p>Martínez-Labarga C., Cianfanelli A., De Angelis F., Lelli R., Scorrano G., Brilli M., Giustini F., Anzidei A.P., Angle M., Aurino P., Biondi G., Carboni G., Catalano P., De Santis A., Martini F., Negroni N., Pacciani E., Radina F., Rubini M., Silvestrini M., Rolfo M.F., Volante N., Zaio P., Sarti L., Rickards O.</p>
10:15	<p>LOCAL ANCESTRY ANALYSIS REVEALS THE “HUNTER-GATHERER” STRUCTURE OF SOUTHERN AFRICA</p> <p>Montinaro F., Gonzalez-Santos M., Busby G., Oosthuizen O., Oosthuizen E., Anagnostou P., Destro-Bisol G., Pascali V., Capelli C.</p>
10:30	<p>THE MIGRATION PERIOD IN EUROPE: GENETIC ANALYSIS ON LOMBARDS SAMPLES</p> <p>Vai S., Ghirotto S., Lari M.1, Rizzi E., Krause J., Posth C., Veeramah K., Geary P., Barbujani G., Caramelli D.</p>
10:45	Discussion
11:00	Coffee break
11:15	<p>THE EMERGING COMPLEXITY OF GENOMIC ARCHITECTURE IN HUMAN POPULATION ISOLATES</p> <p>Anagnostou P., Dominici V., Battaglia C., Pagani L., Vilar M.G., Wells R.S., Pettener D., Luiselli D., Boattini A., Francalacci P., Calò C.M., Destro Bisol G., Tofanelli S., The Genographic Consortium</p>
11:30	<p>BMI, LIFESTYLES AND SELF-RATED HEALTH IN TEENAGERS OF THE EMILIA-ROMAGNA REGION</p> <p>Gueresi P., Cavrini G.</p>
11:45	Discussion
12:00	Flash talks: Session III
12:45	Buffet Lunch & Poster Session

14:15	TOWARDS A DEEPER DISSECTION OF THE ITALIAN GENOMIC LANDSCAPE Sazzini M. , Gnechi Ruscone G.A., Giuliani C., Sarno S., Boattini A., Gentilini D., Fiorito G.D., Di Blasio A.M., Matullo G., Salvarani C., Franceschi C., Garagnani P., Pettener D., Luiselli D.
14:30	DENTI, TARTARO E ANTICHI TESSUTI. UN CASO DI ANALISI INTEGRATA PER L'INDIVIDUAZIONE DI ATTIVITÀ LAVORATIVE NELL'ANTICA COMUNITÀ DI GRICIGNANO D'AVERSA (CAMPANIA, 2500-1750 BC) Sperduti A. , Frayer D., Rossi P.F., Guida G., Giuliani M.R., Vaccaro S., Bondioli L.
14:45	WEIGHT STATUS IN WOMEN OF NORTH AFRICAN ORIGIN LIVING IN ITALY Toselli S. , Rinaldo N., Caccialupi M.G., Gualdi-Russo E.
15:00	Discussion
15:15	PERFORMANCE IN COMPETITIVE RUNNERS: ANTHROPOMETRIC, GENETIC AND PSYCHOLOGICAL FACTORS Zaccagni L. , Barbieri D., Missoni S., Šarić T., Šarac J., Babic V., Baric R., Rakovac M., Bernardi F., Lunghi B., Gualdi-Russo E.
15:30	GENDER BIAS IN SARDINIAN POPULATIONS REVEALED BY THE ANALYSIS OF UNIPARENTAL MARKERS Bachis V. , Corrias L., Culigioni C., Robledo R., Mameli A., Sanna E., Vona G., Calò C.M.
15:45	ANTHROPOMETRIC AND BIOMECHANICAL CONTRIBUTION IN BASKETBALL PLAYERS SELECTION Micheletti Cremasco M. , Pizzigalli L., Benis R., La Torre A.
16:00	Discussion
16:15	AAI members meeting
17:45	Bus transfer to Ravenna
20:30	Conference Dinner

SEPTEMBER 5 (Dept. of Cultural Heritage, Conference Room - 1, degli Ariani, Ravenna)	
09:15	Symposium III: Keynote Lecture WHEN SIMULATION MEETS MORPHOMETRICS: FORM AND FUNCTION IN THE HOMININ FOSSIL RECORD Paul O'Higgins
10:15	NEW DATA FROM ISERNIA LA PINETA (MOLISE): THE OLDEST HUMAN FOSSIL SPECIMEN IN ITALY Peretto C. , Arnaud J., Moggi Cecchi J., Manzi G., Nomade S., Pereira A., Falguères C., Bahain J.J., Grimaud-Hervé D., Berto C., Sala B., Lembo G., Muttillio B., Gallotti R., Thun Hohenstein U., Vaccaro C., Coltorti M., Arzarello M.
10:30	EXPLORING MORPHOLOGICAL DIFFERENCE IN HOMINOID TALI BASED ON GEOMETRIC MORPHOMETRIC METHODS Minghetti C. , Parr W., Ryan T., Carlson K., Turley K., Wroe S., Gruppioni G., Shaw C., Saers J., Su A., Fiorenza L., Frost S., Benazzi S.
10:45	Discussion
11:00	Coffee break
11:15	EARLIEST EVIDENCE OF PROTO-DENTAL TREATMENT IN THE LATE UPPER PALEOLITHIC Oxilia G. , Oxilia G., Peresani M., Romandini M., Matteucci C., Debono Spiteri C., Henry A.G., Schulz D., Archer W., Crezzini J., Boschini F., Boscato P., Jaouen K., Dogandzic T., Broglio A., Moggi Cecchi J., Fiorenza L., Hublin J.J., Kullmer O., Benazzi S.
11:30	LA STIMA DELL'ETÀ MEDIANTE LO STUDIO DELL'APPOSIZIONE DELLA DENTINA SECONDARIA: DIECI ANNI DI AGESTIMATION PROJECT Cameriere R. , Ferrante L., Bertoldi F., Bestetti F.
11:45	Discussion
12:00	Symposium IV: Keynote Lecture MOLECULAR PALEOPATHOLOGY: THE CHALLENGE OF THE PLAGUE Barbara Bramanti
13:00	Lunch
14:30	THEORETICAL ASPECTS OF PHYSICAL-CHEMICAL PARAMETERS FOR THE CORRECT CONSERVATION OF MUMMIES ON DISPLAY IN MUSEUMS Samadelli M. , Roselli G., Fernicola V.C., Moroder L., Zink A.R.

14:45	<p>WHOLE MTDNA SEQUENCING IN ALPINE POPULATIONS AND THE GENETIC HISTORY OF THE NEOLITHIC TYROLEAN ICEMAN</p> <p>Coia V., Cipollini G., Anagnostou P., Maixner F., Battaglia C., Brisighelli F., Carballa A.G., Destro Bisol G., Salas A., Zink A.R.</p>
15:00	<p>I RESTI UMANI DEL COMPLESSO FUNERARIO DI NEFERHOTEP (XVIII-XIX DINASTIA, VALLE DEI NOBILI, LUXOR, EGITTO)</p> <p>D'Anastasio R., Viciano J., Cilli J., Sciubba M., Capasso L.</p>
15:15	Discussion
15:30	<p>VARIABILITY IN ISOTOPIC VALUES RELATED TO POOR HEALTH STATUS IN ARCHAEOLOGICAL POPULATIONS</p> <p>Scorrano G., Amicucci G., Battistini A., Caldarini C., Cesana D., De Angelis F., Di Giannantonio S., Gaspari L., Ilardi M.B., Mosticone R., Pantano W., Pescucci L., Zavaroni F., Brilli M., Catalano P., Rickards O.</p>
15:45	<p>ANTHROPOLOGICAL ANALYSIS OF CREMATED REMAINS FROM THE LATE BRONZE AGE CEMETERY OF SLATINA, CROATIA</p> <p>Premužić Z., Šikanjić P.R., Dizdar D. L.</p>
16:00	<p>FROM UPPER PALEOLITHIC TO ENEOLITHIC: MITOCHONDRIAL GENOME ANALYSIS OF ANCIENT HUMAN SAMPLES FROM CENTRAL-SOUTHERN ITALY</p> <p>Gigli E., Posth C., Scorrano G., Lelli R., Martini F., Pacciani E., Aurino P., Ronchitelli A., Krause J., Martinez-Labarga C., Rickards O., Caramelli D., Lari M.</p>
16:15	Discussion
16:30	<p>Round Table II</p> <p>CIBO E SCELTE ALIMENTARI FRA PASSATO E PRESENTE: IMPLICAZIONI BIOLOGICHE, BIOETICHE E SANITARIE</p> <p>Moderatore: Chiarelli B.</p> <p>Interverranno: Mannino M., Capatti A., Morini G., Gualdi E.</p>
18:00	Poster Awards & Concluding Remarks

FLASH TALKS

SEPTEMBER 3

(Complesso Belmeloro, Room A - 14, Belmeloro, Bologna)

I Session (h. 12:45)

A FORENSIC APPROACH TO THE ANALYSIS OF SHARP FORCE TRAUMA ON AN
ARCHAEOLOGICAL CRANIUM: POTENTIALS AND PITFALLS

Sguazza E., *Mazzarelli D., Gibelli D., Rizzi A., Mazzucchi A., Cattaneo C.*

A RITUAL DEPOSITION IN THE PREHISTORIC SITE OF GROTTA DELLA MONACA
(CALABRIA, ITALIA)

Arena F., *Larocca F., Gualdi-Russo E.*

FIRST GENETIC STUDY OF VILLANOVIANS: PRELIMINARY OUTCOMES FROM THE SKELETAL
REMAINS OF TRILOGIA NAVILE NECROPOLIS (BO), VII C. B.C.

Graffi G., *Cilli E., Fiorillo F., Maestri C., Zambruno S., De Fanti S., Belcastro M.G.,
Luiselli D., Gruppioni G.*

A GLOBAL STUDY OF SEX DIMORPHISM VARIABILITY IN MODERN HUMANS' CRANIA

Pozzi A., *Belcastro M.G.*

PALMAR DERMATOGLYPHICS OF CORSICANS AND COMPARISON WITH
THOSE OF SARDINIANS

Floris G., *Calò C.M.*

RADIOLOGICAL TOOTH/PULP RATIO IN CANINES AND INDIVIDUAL AGE ESTIMATION IN A
SAMPLE OF ADULT NEOLITHIC SKELETONS FROM ITALY

Fabbri P.F., *Viva S., Ferrante L., Lonoce N., Tiberi I., Cameriere R.*

EAR BONES IN NON HUMAN PRIMATES: A MORPHOMETRIC CONTRIBUTION TO TAXONOMY

Siori M.S., *Lastella S., Micheletti Cremasco M.*

THE EARLY BRONZE AGE NECROPOLIS OF SORBARA DI ASOLA (MN)

Dori I., *Baioni M., Moggi Cecchi J.*

II Session (h. 16:15)

FALSI MITI E NUOVE SCOPERTE. COME L'ANTROPOLOGIA HA CONTRIBUITO A CAMBIARE LA
VISIONE TRADIZIONALE DELLE POPOLAZIONI DELL'ETÀ DEL BRONZO

Cavazzuti C.

IS THE EVALUATION OF MILLENNIAL CHANGES IN STATURE RELIABLE? A STUDY IN SOUTHERN
EUROPE AND ANATOLIA FROM THE NEOLITHIC TO THE MIDDLE AGES

Martella P., Milia N., Lai L., Fonzo O., Sanna E.

L'ESPOSIZIONE DELLE MUMMIE AL MUSEO UNIVERSITARIO DI CHIETI:
UNA SCELTA CONSAPEVOLE

Del Cimmuto M., Fazio A., Di Fabrizio A., Sciubba M., Paolucci A., Monza F.

LONG TRANSHUMANCE BETWEEN HIGHLAND AND LOWLAND SARDINIANS: A SURNAME
DISTRIBUTION ANALYSIS

Orrù A., Girotti M., Sanna E., De Iasio S.

STIMA DELLA DATA DELLA MORTE ATTRAVERSO IL RIMODELLAMENTO ALVEOLARE:
A CASE REPORT

Cilli J., Viciano J., D'Anastasio R., D'Ovidio C., Capasso L.

THE PALEOPATHOLOGICAL COLLECTION OF CAGLIARI UNIVERSITY:
CASE STUDIES AND FUTURE PROPOSAL

Sarigu M., Floris R., Floris G.U., Pusceddu V.

GLI INUMATI DI ETÀ MEDIEVALE DI MODENA-NOVI SAD: ANALISI PALEOBIOLOGICA,
PALEODEMOGRAFICA, PALEOPATOLOGICA E PALEONUTRIZIONALE NEL QUADRO DEL
POPOLAMENTO DELL'EMILIA-ROMAGNA

Bertoldi F., Bartoli F., Bacci A., Penzo D., Librenti M., Sisalli C.

EGYPTIAN MUMMIES IN THE COLLECTIONS OF THE MUSEUM OF ANTHROPOLOGY AND
ETHNOGRAPHY AT THE UNIVERSITY OF TURIN: RESEARCH AND CONSERVATION

Boano R., Martina M.C., Gandini G., Rabino Massa E.

L'AGGREGAZIONE SOCIALE COME RIFLESSO DELLE PRATICHE FUNERARIE DELL'ARABIA DEL II-I
MILLENNIO A.C.: ANALISI TAFONOMICA E ANTROPOLOGICA DELLE GRANDI TOMBE
COLLETTIVE DI DABA (PENISOLA DI MUSANDAM, OMAN)

Nava A., Fattore L., Mancinelli D., Genchi F., Coppa A.

SEPTEMBER 4

(Complesso Belmeloro, Room A - 14, Belmeloro, Bologna)

III Session (h. 12:00)

EXPLORING DIETARY VARIABILITY IN PREHISTORIC CENTRAL TALY:
A MULTI STABLE ISOTOPE APPROACH

Varalli A., Moggi Cecchi J., Moroni A., Goude G.

AT THE EAST OF THE ANDES: GENETIC PROFILE OF AMAZONIAN PEOPLE FROM PERU'

**Di Corcia T., Maggiulli O., Sanchez Mellado C., Davila T.J., Ferri G., De Fanti S.,
Luiselli D., Rickards O.**

LACK OR UNCERTAINTY OF BIRTH DATA AND CONSEQUENCES ON MALNUTRITION
ESTIMATES IN SUB-SAHARAN AFRICA

Comandini O., Cabras S., Latini V., Lussu P., Martella P., Marini E.

FEEDING THE CITY: ISOTOPE VARIATION IN IMPERIAL PERIOD COMMUNITIES IN ROME
(1ST-3RD CENTURIES AD)

**De Angelis F., Battistini A., Caldarini C., Di Giannantonio S., Mosticone R., Pantano W.,
Pescucci L., Scorrano G., Zavaroni F., Brilli M., Rickards O., Catalano P.**

FROM THE TYRRHENIAN TO THE ADRIATIC SEA.

DISENTANGLING GENETIC STRATA IN CENTRAL ITALY

**Boattini A., Pagani L., Francalacci P., Sarno S., Guichard E., De Fanti S., Quagliariello A., Taglioli
L., Varesi L., Paoli G., Destro-Bisol G., Calò C., Luiselli D., Pettener D., Wells S., Vilar M.G.,
Tofanelli S., Genographic Consortium**

DEMOGRAPHICAL EVOLUTION AND MITOCHONDRIAL LINEAGE EXTINCTION

D'Amore G., Frederic P., Di Bacco M.

ORIGIN OF THE AMYLOIDOGENIC TTR*VAL30MET MUTATION IN THE ITALIAN POPULATION

**Iorio A., De Angelis F., Di Girolamo M., Luigetti M., Pradotto L., Mauro A., Manfellotto D.,
Polimanti R., Fuciarelli M.**

INTERSTITIAL TELOMERIC SEQUENCES DISTRIBUTION IN EIGHT NEOTROPICAL PRIMATES
(PLATYRRHINAE) BY (TTAGGG)_N PROBE MAPPING

Dumas F., Sineo L.

DIETARY RECONSTRUCTION OF AN EARLY-MIDDLE BRONZE AGE POPULATION FROM
NORTHERN ITALY (BALLABIO, LECCO): A MULTIDISCIPLINARY APPROACH

Masotti S., Goude G., Gualdi-Russo E., Moggi Cecchi J., Varalli A.

Abstracts



Keynote Lectures



HOW WE SETTLED THE WORLD AND DEVELOPED OUR CULTURE

Eske Willerslev

Centre for GeoGenetics, National History Museum of Denmark, University of Copenhagen

One of the most fundamental problems in the history of mankind is to understand the processes that created the genetic/cultural diversity among humans today. Despite more than a century of research in archaeology and anthropology, major questions remain unanswered or heavily debated. The reason is our inability to link human populations and their cultures across time. Attempts to close this gap were made through genetic studies. However, studies of living peoples infer the past from present diversity/distributions, both of which have been shaped by a history of colonisation, admixture and globalisation. aDNA studies provide direct information about past human diversity. Until recently, however, the field suffered from problems of contamination and scope, restricted to mtDNA, a poor marker for testing complex demographic scenarios. This changed in 2010, when my research group published the first ancient human genome. The results dismissed the commonly held belief that it is not possible to obtain reliable nuclear DNA sequences from modern remains due to contamination. We also showed the power of ancient genomics by revealing a hitherto unknown migration from Siberia into the Americas, independent of those that gave rise to today's indigenous peoples in the New World, information not retrievable from modern data. Since then, we have used ancient genomics to settle some of the most important controversies regarding the origins/dispersals of our species, and the cultural changes that followed. We have shown that the ancestors of Aboriginal Australians were the first human population to settle the World beyond Africa, 30-40kyr before European and Asian ancestors settled in Eurasia. Since then, we have also shown that the distribution of ancestral Europeans and Asians was very different in the past, and that the genetic geography of humans today is very shallow, in most cases less than 4kyr old. One of the main outcomes of these studies is the realisation of the previously unknown amazing complexity of human evolutionary history, e.g. Native Americans, thought to descend from a group of East Asians who crossed the Bering Strait 13-10kya, trace ca. 1/3 of their genome to a population that also gave rise to present-day Europeans, but not to East Asians. Another is that the relationship between cultural and genetic change reflects multidimensional processes that create a web of outcomes at different geographic scales: a migration may disperse genes and ideas, but the ideas may travel further, creating a much wider pattern of cultural change than reflected in the genetic make-up of people, important shifts in cultural parameters can occur in the absence of demographic change. Thus, ancient genomics allows testing the nature of cultural change in the past, one of the most longstanding problems in Archaeology. We have also used aDNA to explore the extent to which early modern man affected the environment. We have shown that, although early man impacted his surroundings through hunting, the mass extinctions of big mammals at the end of the Ice Age, a topic of extensive debate for more than a century, was mainly driven by climate/vegetation changes rather than human overkill, thereby challenging the idea of an early rise of the Anthropocene.

**ITALIAN DIETS THROUGH TIME:
AN OVERVIEW OF RESEARCH METHODS AND THEMES**

Marcello A. Mannino

Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig

The study of what people ate in antiquity is a key area of archaeological and anthropological research, because it provides us with unique perspectives on how humans adapted to past environments and on how culture influenced our subsistence. Information on human diet is available in many forms, which can essentially be divided into two broad categories: data on past meals represented by the remains of food refuse and data on the foodstuffs actually consumed by people through analyses on human tissues.

The potential and limitations of all these tools for palaeodietary reconstruction will be reviewed here, although more attention will be paid to biomolecular methods. Their use for archaeology started forty years ago, but despite this their application on Italian human skeletal remains has been relatively limited.

The aims of this talk are to outline the contribution of biomolecular analyses to our knowledge of Italian diets through time and to suggest future research trajectories to adequately exploit the rapidly-expanding range of isotopic approaches at our disposal.

**WHEN SIMULATION MEETS MORPHOMETRICS:
FORM AND FUNCTION IN THE HOMININ FOSSIL RECORD**

Paul O'Higgins

Centre for Anatomical and Human Sciences, Department of Archaeology and Hull York
Medical School, The University of York, UK

Virtual methods for the study of skeletal form and function have impacted greatly on studies of human evolution. A key advance was the development of methods for the analysis of variation in size and shape based on landmarks, geometric morphometrics (GM). These methods have resulted in many publications concerned with understanding how fossils differ from each other and from ourselves and in assessing how these differences covary with e.g. phylogeny, social structure, behaviour and environmental factors. The methods of GM are well suited to describing patterns of morphological evolution, but can only relate these to function in a second analytical step that either 1) searches for interesting associations between morphology and functional variables or 2) uses knowledge of functional anatomy to infer how well a particular morphology might or might not fit a particular function. Beyond landmarks, modern imaging technologies allow us to construct virtual representations of fossil material. These have formed the basis of studies of size and shape variation using GM, but they also offer the prospect of enabling virtual simulation of function, to directly assess skeletal performance in carrying out specific tasks. This simulation approach can potentially support the process of relating morphological to functional differences.

In this presentation, the application of GM and finite elements analysis (FEA) to interpretation of fossil functional morphology will be reviewed. FEA allows us to virtually simulate skeletal loading and predict how the skeleton behaves in response. It has been applied in hominins and more widely in living primates to infer such things as dietary and locomotor adaptations. Most recently, the changes in size and shape (deformations) of virtual models of skeletal elements subjected to FEA have been compared using the methods of GM. This combination of GM and FEA facilitates enquiry into the key issue of how to build finite element models whose behaviour reflects reality. Thus, while FEA has potential in studies of form and function, how effectively does it predict skeletal behaviour? Given what we know of the advantages and limitations of FEA, what kinds of analyses are feasible and what kinds of analyses are not?

The answers to these questions are critical in planning future FEA studies of skeletal material in a comparative context and in thinking about how we can refine explorations of how form and function are intertwined in our own fossil record.

MOLECULAR PALEOPATHOLOGY: THE CHALLENGE OF THE PLAGUE

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Molecular paleopathology has often demonstrated to be effective in solving controversies about the retrospective diagnosis of several pathologies in skeletal remains, in particular concerning infectious diseases. One example of this is the identification of the etiological agents of the plagues that in historical times killed large proportions of the European population, the first pandemic (6th-7th centuries), started with the Justinian plague, and the second one (14th-18th centuries), started with the Black Death.

In the last few years, new investigations on putative plague victims of the past by means of ancient DNA (aDNA) analyses have confirmed that *Yersinia pestis*, the causative agent of the third and current plague pandemic, was the culprit of the past pestilences as well. These works have enabled a deeper insight into the genetics, the genomics and the phylogeny of the ancient plague pathogens and allowed inferences about their variability, provenience and place of evolution in comparison to modern strains.

Nevertheless, incongruences still persist regarding the modalities of transmission that do not fit perfectly with the modern reports, the past routes of dissemination through the continents, the implication of wild and anthrochorous fauna and the interplay between climatic conditions and plague dynamics. An ERC-Advanced Grant (MedPlag. The medieval plagues: ecology, transmission modalities and routes of the infections) will now try to answer these open questions about the historical pestilences with interdisciplinary studies involving molecular analyses, archaeology, climatology, ecology, and history.

Oral Presentations



THE EMERGING COMPLEXITY OF GENOMIC ARCHITECTURE IN HUMAN POPULATION ISOLATES

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Keywords: *Population Genetics, Isolated Population, GenoChip 2.0, Demographic History*

Each population isolate has a unique demographic history in terms of initial size, time since foundation and growth rate. These factors can shape their genetic makeup both at the individual and population level. However, is it possible to identify patterns relating genomic diversity and demographic history? To answer this question we analyzed approximately 90,000 autosomal ancestry informative markers (AIMs) as part of the Genochip (National Geographic Society, Washington, DC & Family Tree DNA, Houston, Texas, USA) in eight Italian populations, all subject to geographic and/or cultural isolation factors. Four were from Sardinia (old and large isolates) and as many from the eastern Alps (young and small isolates). The same panel of AIMs was analyzed in literature data relative to both open and isolated European groups, for a total of 24 populations. Alpine isolates (German-speaking linguistic islands of Sappada, Sauris and Timau) showed stronger signals of genetic isolation [i.e. frequency and size of Runs of Homozygosity, LD decay and intra-group distributions of Identity by State (IBS)] than older and larger groups (Sardinians, Basques and Orcadians). Rather unexpectedly, the ADMIXTURE and PCA analyses, as well as the comparison of intra-group IBS distributions, highlighted a noticeable genetic heterogeneity within Sappada, Sauris and Timau, likely due to relatively recent admixture events. This pattern, undetected in any other population sample, is at odds with the conventional view of a substantial genetic homogeneity within population isolates. Significance and implications of our results are discussed in relation to both micro-evolutionary aspects and bio-medical applications.

**A REASSESSMENT OF THE MIDDLE PALEOLITHIC HUMAN REMAINS
FROM RIPARO TAGLIENTE, ITALY**

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Keywords: *Neandertal, Deciduous Teeth, Micro-Computed Tomography*

Paleoanthropological researches are often biased by sample size, which limits our understanding about human species variability. The discovery of new fossil remains has an important place in the perception of taxon variability but the assessment and reassessment of human fossil remains discovered decades ago and often unknown to the scientific community represent a further opportunity to address this issue.

In the present study, we use microCT data to provide a detailed description of Tagliente 3 (upper right second deciduous molar) and Tagliente 4 (lower left deciduous canine), two deciduous teeth from the Mousterian level of Riparo Tagliente (Stallavena di Grezzana, Verona) attributed to *Homo neanderthalensis*.

In terms of morphology (i.e., potentially large hypocone and complex topography of the enamel-dentine junction) and size, Tagliente 3 presents typical Neandertal derived features. Although deciduous canines do not provide substantial morphologically diagnostic information, Tagliente 4 has a bucco-lingual diameter that falls in the upper range of the Neandertal variability, and outside the modern human range of variation.

Since deciduous teeth have been less investigated than the permanent ones, this contribution reveals the importance of reassessing human remains and brings new data to increase our knowledge on the variability of the Neandertal deciduous dentition.

GENDER BIAS IN SARDINIAN POPULATIONS REVEALED BY THE ANALYSIS OF UNIPARENTAL MARKERS

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Keyword: *Sardinians, mtDNA HVRI, Y-STRs, Gene Flow*

Sardinian population has been frequently analyzed because of its genetic peculiarity and its internal heterogeneity due to the presence of several genetic isolates. Recent researches, on the basis of uniparental markers, suggested a larger male than female mobility, in some Sardinia villages, confirming data on matrilocal behavior. This hypothesis seems in contrast with the pastoral economy typical of Sardinia.

In this study we want to verify the differences between female and male migration/isolation pattern hypothesis analysing data from different villages.

Fst analysis showed a greater number of significant comparisons for mtDNA than for Y-STRs (13 vs 10), and the percentage of variance among populations, carried out with AMOVA, was higher for Y-STRs than for mtDNA.

The network, performed by the haplotypic data, showed a wide net when Y-STRs were analyzed, not permitting to group the Sardinian populations into clusters, while the mtDNA analysis showed a typical star-like network. Interesting observation were obtained from PCA analysis. In fact, it showed a different position for the isolate of Desulo and the North Sardinia: the isolation of Desulo was highlighted by mtDNA analysis, while through Y-STRs analysis it clustered with Northern Sardinian population in a separate quadrant with respect to the other Sardinian populations. These results seem to support, at least for some villages, a matrilocal behavior.

In conclusion, this paper demonstrated how the analysis of uniparental markers can highlighted the different matrimonial pattern even within a microarea such as Sardinia.

**LA STIMA DELL'ETÀ MEDIANTE LO STUDIO DELL'APPOSIZIONE DELLA DENTINA SECONDARIA:
DIECI ANNI DI AGESTIMATION PROJECT**

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Keywords: *Stima dell'Età, Dentina Secondaria, Radiografia, Canini*

L'apporto della dentina secondaria è un processo continuo, che risulta condizionato solo dalla presenza di carie o usure importanti.

Il metodo presentato permette la stima dell'età nel soggetto adulto, attraverso un approccio radiografico: l'età viene calcolata in base al rapporto tra l'area della cavità pulpare e l'area della superficie totale del dente.

Mentre da un lato l'utilizzo delle radiografie permette una facile acquisizione, ed anche un facile scambio del materiale, dall'altro, la semplicità del metodo permette un rapido apprendimento e una buona riproducibilità, caratterizzata da un basso errore intra ed extra-osservatore.

Il metodo sviluppato si basa sull'analisi dei canini che sono sicuramente i denti meno interessati dai processi di usura dentaria, e sono tra gli ultimi denti ad essere persi, inoltre, essendo denti monoradicali permettono una definizione più semplice sia della superficie totale del dente che della cavità pulpare.

Sono state sviluppate tre formule: sul canino inferiore, sul canino superiore e su entrambi i canini.

Le prime indagini ai fini della definizione del metodo furono svolte nel 2004 quando si analizzarono 100 OPG di pazienti italiani, aventi un'età compresa tra i 20 e i 72 anni.

Successivamente il metodo è stato testato sia su campioni storici di età nota (analisi dei resti scheletrici di Eleonora Gonzaga e di 9 mummie aragonesi), sia su campioni facenti parte di importanti collezioni osteologiche (analisi di 200 *periapicals x-ray* di individui della collezione osteologica di Sassari).

Come dimostrato negli ultimi anni, il metodo ha dato risultati estremamente positivi sia in ambito forense che in ambito storico-archeologico, potendo essere applicato sia su soggetti viventi che su resti scheletrici. In particolare, l'applicazione del metodo a materiale di provenienza archeologica risulta interessante poiché permette di sopperire al problema della scarsa rappresentazione dei resti scheletrici, condizione che incide fortemente sugli studi antropologici di questo settore.

**DISCOVERING PAST GUT MICROBIOMES THROUGH NGS ANALYSIS:
THE MUMMIES OF ROCCAPELAGO (MO)**

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Keywords: *Ancient DNA, Gut Microbiota, 16S rDNA, NGS, Stable Isotopes*

The gut microbiota plays a primary role in metabolism and immune response of host organisms. It is influenced by lifestyle, diet and environment but little is known about its ancestral state and evolution, especially in relation to past human dietary shifts, the impact of industrialization and the introduction of antibiotics. In the reconstruction of the ancestral state of gut microbiota, recent pioneering studies have focused on contemporary rural populations or ancient coprolites. This paper presents the first screening of microbiota by NGS technology from ancient human gut tissues. We collected samples from ten Roccapelago mummies (16th-18th c. AD) from different anatomical tissues (gut, skin, muscle). In addition, samples of soil and clothes were analyzed to detect environmental contamination. Paleodiet reconstruction by stable isotopes analysis ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) was performed on femurs and teeth. Moreover, information about diet, lifestyle and health were recovered from parish registers and historical documents.

DNA was extracted with a silica-based protocol and amplicons of 16S rRNA gene (V3 region) were sequenced on 454/Roche obtaining an average of 10.059 reads per sample. The bioinformatic analysis using the MICCA pipeline reveals a consistent diversification between tissues (gut vs muscle vs skin), with an enrichment of Actinobacteria in gut samples (18%) in respect to muscle and skin samples, despite Clostridiales are represented in all tissues analyzed. Interestingly, halophilic Gram-positive bacteria from Staphylococcaceae (6%) are found in gut samples. Investigation of a potential physiological basis of this association may lead to new insights into the reconstruction of past gut microbiomes.

**WHOLE MTDNA SEQUENCING IN ALPINE POPULATIONS AND
THE GENETIC HISTORY OF THE NEOLITHIC TYROLEAN ICEMAN**

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Keywords: *Ötzi, Easter Italian Alps, Haplogroup K1, Mitogenomes*

The Tyrolean Iceman is an extraordinarily well-preserved mummy of a male individual who lived in the south of the Alpine ridge ~5200 years BP, during the Copper Age. Although several studies have investigated the genetic profile of this important remain, the relation of the Iceman's maternal lineage with present-day mitochondrial variation remains elusive. Study of Iceman mtDNA complete sequence carried out so far show that he belongs to a new branch of the mtDNA haplogroup K1 (K1f) not found in extant populations. This study analyzes the complete mitogenomes of 42 haplogroup K bearing samples from populations from Eastern Alps and compares the mummy's sequence with a large dataset of worldwide K1 sequences. Our results allow us to refine the K1 phylogeny and favor the hypothesis of an extinction of K1f in the course of the demographic events occurred in the last 5000 YBP rather the lack of detection due to inadequate sampling. Finally, we propose a scenario that can explain the apparent contrast between the phylogeographic features of maternal and paternal lineages of the Tyrolean Iceman within the context of the dynamics in Europe since 8000 YBP.

I RESTI UMANI DEL COMPLESSO FUNERARIO DI NEFERHOTEP (XVIII-XIX DINASTIA, VALLE DEI NOBILI, LUXOR, EGITTO)

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Keywords: *Antropologia, Tafonomia, Mummiologia, Paleopatologia*

La "Valle dei Nobili" è un'area sepolcrale collocata tra la Valle dei Re e la Valle delle Regine, insieme alle quali costituisce la Necropoli Tebana, ed ospita le tombe di antiche famiglie aristocratiche.

Nel complesso, oltre alla tomba di Neferhotep (TT 49, XVIII Dinastia), sono presenti le tombe: TT187, TT347, TT348, TT362, TT363.

Le TT347 e TT348 di epoca ramesside, e la tomba TT363 (XIX Dinastia) sono ancora chiuse.

Le tombe TT187, TT362 e TT49, hanno restituito numerosi resti umani in differente stato di conservazione.

La condizione del complesso funerario, totalmente sconvolto dalla frequentazione sia recente che passata dei vari ambienti, ha reso necessario l'impiego dei metodi antropologici e paleopatologici generalmente utilizzati in contesti che non permettono l'identificazione dei singoli individui e dei livelli stratigrafici.

I resti rinvenuti nella tomba TT187 (scavo non ancora ultimato) presentano segni evidenti di combustione ed altre alterazioni tafonomiche che testimoniano la frequentazione dei locali negli ultimi decenni.

Alquanto differente appare il contesto della tomba TT362 contenente resti umani e animali mummificati, disarticolati e senza alterazioni correlabili all'esposizione ad alte temperature. I resti sono ascrivibili a 47 individui: 32 adulti (16 maschi, 8 femmine e 8 indeterminati), 6 individui giovanili e 9 infanti.

La tomba TT49 conservava i resti attribuibili ad un unico individuo, rinvenuti all'interno della camera funeraria.

I dati antropologici e tafonomici preliminari indicano la frequentazione delle tombe all'interno del complesso funerario di Neferhotep da parte delle popolazioni locali, pur conservando segni del loro antico utilizzo durante il periodo tolemaico, greco-romano e copto.

THE SIGNIFICANCE OF MICROFOSSILS RECOVERED FROM DENTAL CALCULUS FOR ANTHROPOLOGICAL ANALYSIS

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Keywords: *Palaeodiet, Archaeobotany, Bioarchaeology, Starch analysis*

Trace amounts of food and environmental micro-debris such as starch grains, phytoliths and fibers are preserved, together with organic components such as lipids and proteins, within dental calculus. The recovery and identification of these elements appear fundamental for the reconstruction of the palaeodiet, lifestyle and paleoenvironment of ancient populations. This is a relatively new line of investigation. Therefore, it needs specific efforts in order to define new protocols of analysis: in particular, chemical procedures to wash and dissolve the samples in order to recover the greatest variety of microfossils, or the improvement of atlas of images for the identification of plants' micro remains and other biological materials. Our work followed two steps. Step one focused on the study of several ancient cereals, since they are the plant organ with the highest starch content (about 70%) and one of the major sources of carbohydrates of the human diet. Therefore, we analysed different dental calculi sampled from skeletal remains recovered at the Necropolis of Can Reiners (7th century AD), in *Pollentia* (Palma of Mallorca, Spain), the most important Roman city in the Balearic Islands. This research shows that, within the sampled dental calculi, there are discrete concentrations of starch grains, fibers and other botanical remains, such as spores and pollen grains. This is the first insight into the study of diet through calculus analysis in this population. The identification of these elements allows us to better understand the diet and other human behaviors of the late roman community of Can Reiners.

**IDENTIFICATION OF MISSING CHILDREN:
A QUANTITATIVE APPROACH TO THE ANALYSIS OF FACIAL MORPHOLOGY**

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Keywords: *Personal Identification, Face, Missing Children, Matlab®*

The problem concerning missing children is a very sensitive issue from a social point of view, often embraced with different fields of criminality, since the organ trafficking to minor prostitution and illegal adoption. Since in June 2014 29763 persons were still missing, among whom more than one half were minors¹: the relevant social impact of this phenomenon is therefore clear, which brings about several limits to identification both from a technical and scientific point of view. Two main problems affect the identification of missing children: the limited chances of recognizing a growing face by comparison with photos taken sometimes years before, and the need for quantifying the judgment of positive identification.

This study aims at developing and testing a method of comparison between images of minors, based on stable facial markers (in detail, nevi were used). The project took into consideration 143 photos of the same face performed at different ages by 41 subjects. A sample of 110 images from 16 individuals with facial nevi were selected, and then analysed by software MATLAB® R2014b. Ten facial landmarks were used in order to predict variables concerning the orientation of face and growth. Distance between the nevus and the predicted area was calculated and quantified by a score between 0 (highest distance between the position of nevus and the predicted area) and 1 (highest concordance between the two areas). In total 68 comparisons were performed (27 between photos of the same subject at different ages, 22 between photos of the same subject at the same age and 19 between photos of different subjects at different ages).

Results show that comparison of photos of the same subject provide score was equal or higher than 0.2, whereas in cases of different persons the score was always equal or lower than 0.3.

The study shows an attempt at quantifying the judgment concerning identification based on photos of minors in growth, applicable to every stable individualizing marker of face: further studies are needed in order to test the method and reduce the errors.

¹ Ministero dell'Interno, Commissario Straordinario per le Persone Scomparse, Relazione 2014

FROM UPPER PALEOLITHIC TO ENEOLITHIC: MITOCHONDRIAL GENOME ANALYSIS OF ANCIENT HUMAN SAMPLES FROM CENTRAL-SOUTHERN ITALY

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Keywords: *Ancient DNA, Next Generation Sequencing, Mitochondrial Genome, Cultural Transitions*

The genetic background of the Italian Paleolithic and the extent of population replacement during the Neolithic is a crucial issue in the human populations of our peninsula evolutionary history. Genetic analysis of ancient DNA can reveal past events that are difficult to discern through study only present-day individuals. Taking advantage of Next Generation Sequencing (NGS) technologies and *ad hoc* bioinformatics pipelines, genomic data as well as supporting evidence for data authenticity can now be obtained from ancient human samples. In the framework of a wider project (PRIN 2010-2011 Biological and cultural heritage of the central-southern Italian population trough 30 thousand years.) we attempted to analyzed the complete mitochondrial DNA of a set of ancient human individuals retrieved from seven archaeological sites located in Central-Southern Italy from Upper Paleolithic to Eneolithic. We found that endogenous DNA can be recovered from the samples. Besides that, our preliminary results show that modern human contamination represents the most difficult issue to overcome when dealing with previously handled museum specimens.

DNA METHYLATION VARIABILITY ALONG THE ITALIAN PENINSULA: AN EVOLUTIONARY PERSPECTIVE REVEALS IMPLICATIONS FOR HUMAN HEALTH AND DISEASES

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Keywords: *Italian Variability, DNA Methylation, Environment, Pathogens, Human Adaptation*

DNA methylation is a molecular mechanism useful for the description of human variability among different populations. This mechanism constitutes an important reservoir of variability useful for adaptation in response to new stimuli and recent studies have demonstrated that selective pressures are able to shape not only the genetic code, but also DNA methylation profiles. Here we depicted the natural variation that occurs in DNA methylation considering individuals who born and lived in different areas of Italy (*i.e.* North, Centre and South). The Italian population is indeed very diverse in terms of culture, traditions, history and genetic background and constitutes a suitable model to investigate mechanisms of adaptation mediated by epigenetic variations. A whole-genome DNA methylation analysis identified an enrichment of differentially methylated regions (DMRs) located in genes involved in nitrogen compound metabolic process and transport. Reactive nitrogen is object of research for environmental issues. Moreover, considering genes that included a DMR, we observed an enrichment of genes involved in response to pathogens, indicating that pathogens diversity across the Italian peninsula constitutes a selective pressure able to shape epigenetic profiles.

In conclusion, our results indicate that DNA methylation changes could represent both a consequence of the genetic architecture, but also a more complex mechanism of adaptation of organisms.

BMI, LIFESTYLES AND SELF-RATED HEALTH IN TEENAGERS OF THE EMILIA-ROMAGNA REGION

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Keywords: *Anthropometry, Obesity, Overweight, Nutritional Surveillance, EQ-5D-Y Questionnaire*

The prevalence of overweight and obesity among children and adolescents has increased in the last decades due to a high calorie diet and over-sedentary lifestyle. This situation has public health implications because it promotes the onset of major chronic diseases.

The present study analyzes the variability of BMI in a sample of 17-year olds from schools of the Emilia-Romagna region. The aims of the study are to investigate the main risk indicators for excess weight at this age and to evaluate the effect of excess weight on self-rated health.

Cross-sectional anthropometric, personal and lifestyle data of 2,398 17-year-old teenagers (1300 males and 1098 females) were collected as part of the So.N.I.A. project, a nutritional surveillance study in the Emilia-Romagna region. Self-rated health was assessed using the Visual Analogue Scale (VAS) of the EQ-5D-Y questionnaire. The association between BMI categories and covariates was studied using a multinomial logistic regression model. The impact of covariates on the distribution of VAS was studied using a quantile regression, which makes it possible to assess the simultaneous effect of the variables considered at each percentile of the conditional distribution.

The results of the study indicate that the main risk factors for excess weight in this sample are eating habits, low physical activity, low education level of father, smoking habits. However, gender differences emerged in the association between BMI categories and covariates.

Overweight and obesity were strongly associated with the self-rated health scores. Girls reported a worse perception of their health than boys.

TESTING FOR THE INFLUENCE OF LIFESTYLE ON GENETIC DIVERSITY THROUGH TIME

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Keywords: *Effective Population Size, Lifestyle, Neolithic Transition*

Cultural factors, such as marriage rules, social stratification, and cultural transmission of fitness, have the potential to influence the pattern of genetic diversity in human populations. Neolithisation, i.e. the transition from a foraging to a food producing lifestyle, entailed many changes in such factors (e.g. sedentarisation, bigger population size, etc.), but its influence on genetic diversity has until now been tested only in restricted geographic areas (e.g. Central Africa).

Here we take advantage of the large amounts of whole-genome SNP data that have become available in recent years to investigate the effect of Neolithisation throughout the Old World. Specifically, we collated data for over 40 populations across Africa and Eurasia, and used the patterns of Linkage Disequilibrium (LD) to reconstruct the effective population size (N_e) through time.

We found that, within each region considered, starting from the Neolithic transition foraging populations have significantly lower N_e than neighbouring food-producers. Using estimates of net primary productivity reconstructed from palaeoclimatic models, we confirmed that such differences are due to the Neolithisation process, rather than simple changes in the availability of environmental resources.

**IN SITU STRONTIUM ISOTOPE ANALYSIS ON BIOGENIC APATITE:
THE USE OF LASER ABLATION AND MULTI COLLECTOR INDUUCTIVELY COUPLED PLASMA
MASS SPECTROMETER (LA–MC–ICPMS) IN ANTHROPOLOGICAL RESEARCH**

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Keywords: *Strontium Isotope, Biogenic Apatite, Laser Ablation, Plasma Mass Spectrometry*

The use of LA–MC–ICPMS in anthropological research is an innovative approach for measuring strontium isotopic ratios of human enamel. This technique, due to its micro-destructivity, allows to exam $^{87}\text{Sr}/^{86}\text{Sr}$ on precious human remains, without the drawbacks of the dissolution method. Despite this advantage, the laser ablation technique (LA) is not without flaws, principally related to unavoidable analytical interferences. For these reasons, data obtained with the laser are usually less precise and accurate than data obtained with the classical dissolution method. In particular, problematic interferences are represented by ^{86}Kr formed in the gas, by double-charged REE (Rare Earth Element), by ^{87}Rb , and by other polyatomic isobaric interferences (i.e. $^{44}\text{Ca}^{40}\text{Ar}$, $^{40}\text{Ca}^{44}\text{Ca}$, $^{40}\text{Ca}^{13}\text{p}^{16}\text{O}$). In this work, we measured the Sr isotopic ratio of a shark tooth with both dissolution and LA method, to test the precision of the LA method. A shark tooth is a bio-apatite formed in a marine environment, thus its $^{87}\text{Sr}/^{86}\text{Sr}$ ratio reflects the modern marine ratio of ~ 0.7092 . Our preliminary laser analyses show that we are able to reproduce the isotopic ratio of our shark tooth obtained by Sr chromatographic separation and HR–MC–ICPMS with a precision to the fourth decimal place and that this ratio reflects the modern sea water value. If confirmed by further studies, our preliminary results suggest that the LA technique is a reliable method to explore hominin movement and migrations.

THE LOWER LIMB OF THE DINALEDI HOMININ SAMPLE

The presentation has been withdrawing since the press release on this study was postponed to September 10, 2015

ANCIENT BIOMOLECULES: A NEW APPROACH TO STUDY BIOLOGICAL AND CULTURAL HERITAGE OF THE CENTRAL-SOUTHERN ITALIAN POPULATIONS THROUGH 30K YEARS

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Keywords: *Ancient Biomolecules, Palaeodiet, Stable Isotopes, Eneolithic, Central and Southern Italy*

The research project goals to point out, through a multidisciplinary approach, genetic, nutritional and mobility patterns of the inhabitants of the central-southern Italy, connected to changes in life styles and economic systems, using the new inference power of biomolecular analyses connected with bioarchaeological records. The aim was reached through a large collection of specimens ranging from the Upper Palaeolithic to the present, with an emphasis on the Copper Age, a period in which socio-economic and cultural changes in subsistence strategies occurred with a differentiation and improving of food productivity. As a first task, we report the stable isotope palaeodietary study from several central and southern Italian areas. Stable isotope analyses of carbon and nitrogen were carried out on collagen extracted from almost 400 human bone remains as well as a range of fauna to reconstruct the environmental conditions and individual dietary histories. Moreover, the collagen yields were also used as a prognostic indicator of bone preservation for the selection of samples to be analysed for ancient DNA through standard ancient mitochondrial DNA (amtDNA) sequencing and Next Generation Sequencing (NGS) of nuclear (both autosomal and Y-chromosome) DNA of a sub-set of the human remains collected from the archaeological sites.

SKANLAB: A NEW, EFFECTIVE AND LOW COST THREE-DIMENSIONAL PROCEDURE FOR THE ESTIMATION OF UPPER-LIMB VOLUME

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Keywords: *Accuracy and Reliability, Upper Limb Volume, Three-Dimensional Technique, Lymphoedema*

The measurement of limb *volume* is widely employed for diagnosing and monitoring various clinical conditions. Therefore, it is fundamental to achieve accurate and reliable estimates and the procedure should be quick and non-invasive.

The aim of this paper was to validate SkanLab, a new procedure characterized by high spatial resolution, portability, non-invasiveness, and low-cost, for the estimation of upper-limb volume. SkanLab is based on the structured-light Kinect™ sensor (Microsoft, USA) and on Skanect (Occipital, USA), and MeshLab (Visual Computing Lab, Italy) softwares.

The volume of twelve plastic cylinders was measured using geometry, as the reference, water displacement, and SkanLab techniques (two raters and repetitions). The right upper-limb volume of thirty adults was measured by water displacement (reference) and SkanLab (two raters and repetitions). The bias and limits of agreement (LOA) were determined using the Bland-Altman method. Intra- and inter-rater reliability were assessed by means of the intraclass correlation coefficient (ICC) and the standard error of measurement.

The measurement bias of SkanLab was -21.9 ml (-5.7%) (LOA: -62.0 to 18.2 ml, -18.1% to 6.7%) for the cylinders and -9.9 ml (-0.6%) (LOA: -49.6 to 29.8 ml, -2.6% to 1.4%) for the upper-limbs. SkanLab's intra- and inter-rater reliability were both very high (ICC > 0.99).

SkanLab is a fast, safe, and low-cost method for assessing upper-limb volume with high levels of accuracy and reliability. It represents a promising tool in clinical applications, such as in lymphoedema assessment.

FACES AND IDENTITIES: IS IT POSSIBLE TO MEASURE THE RELIABILITY OF 3D CRANIOFACIAL APPROXIMATIONS?

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Keywords: *Facial Reconstruction, Craniofacial Approximation, Forensic Science, Forensic Anthropology, Craniofacial Identification*

The craniofacial approximation (CFA) is largely used in forensic identification of unknown skeletonized bodies. Despite numerous forensic reports have proved successful in identifying a cadaver, it is very hard to assess the reliability of CFA methods.

The present work aims to evaluate the accuracy of CFAs through the comparison of a blind facial approximation with a simultaneous faces array test. The blind CFA was made following the Manchester’s protocol.

In our test the CFA was compared with a photographic array of ten faces, included the photo of the individual whom belonged the skull. The positive recognition was evaluated by a total of 320 unfamiliar assessors. During the test a survey was also conducted to evaluate which facial feature mostly drive the process of identification.

The true positive recognition showed extremely poor results. Only the 5% of assessors match the CFA with the target individual photo. The nose was judged the most influential facial feature, but it is also the most problematic anatomical district to approximate due to the lack of strong relationships with the bony part of the skull.

Our results seem to highlight clear limits in positive recognition for CFA based techniques. However, we should consider that positive recognitions of CFAs are usually made by someone in social proximity with the victim. This latter evidence strongly bias any face array test with unfamiliar assessors, keeping the question of CFA reliability still open.

ANTHROPOMETRIC AND BIOMECHANICAL CONTRIBUTION IN BASKETBALL PLAYERS SELECTION

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Keywords: *Anthropometry, Hand Dimensions, Hand Grip Strength, Basketball Players*

Female Italian basketball national players (109 subjects Under14-Seniors) were examined about anthropometric and hand strength characteristics. The aim was to investigate if there is an influence of the hand dimensions on hand grip strength, if they are related to body dimensions and to define a reference scale for talent identification. We measured body mass, height, hand length and breadth (ISO7250-1-2008), maximum hand spread (five fingers' span) (Peebles and Norris, 1998-Visnapu and Jurimae, 2007), maximal handgrip strength (Mathiowetz et al., 1985, by Jamar Hydraulic Hand dynamometer).

Handgrip strength trend increase, as well as age/sport level, raising the statistical significant difference only after 19 years aged players respect to younger, and for dominant (right) hand only in Seniors. It's possible that higher values and asymmetry were induced by strength training. No differences were showed for hand length as expected, but neither for breadth anatomical measures nor for functional dimension as hand span. Furthermore, comparing stature and hand length with not athletes Italian adult females (Masali, 2013, Fubini et al., 2011), the national basketball athletes values are near the highest percentiles, but not the hand length. Moreover, body dimensions show low correlations values with handgrip strength. We concluded that anthropometric selection in basketball players, generally based on stature values already in young athletes, select indirectly also by hand length, but not by breadth and span, and least of all by handgrip strength. We suggest to consider hand grip strength to aid talent identification at a young age and to increase it by training.

EXPLORING MORPHOLOGICAL DIFFERENCE IN HOMINOID TALI BASED ON GEOMETRIC MORPHOMETRIC METHODS

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Keywords: *Talus, Evolution, Shape, Locomotion, Geometric Morphometric*

Understanding talar functional morphology is pivotal to understand the evolution of hominin bipedalism due to its role during locomotion, in part controlling dorsi-plantar flexion, ab-adduction and in-eversion of the foot. Despite recent contributions having utilized increasingly advanced digital methods, further work is warranted to quantify talar shape variation in hominoid primates. Here we apply a geometric morphometric landmark based method, to explore morphological differences in hominoid tali. A template of 251 landmarks (n=15) and semilandmarks (n=236) was digitized on 3D digital models of 80 hominoid tali (*H. sapiens*=20, *Pan*=20, *Gorilla*=20, *Pongo*=20). The models were superimposed with Generalized Procrustes Analysis (GPA), which translates and rotates to minimize the squared distances between homologous landmarks and scales to unit centroid size. Principal Component Analysis (PCA) was used to explore morphological variation of the sample. The first three PCs describe 52,1% of sample variance. Great apes and modern humans separate on PC1 (30,5%), where specimens with positive scores (great apes) exhibited a shorter neck and an overall rounder shape, those with negative scores (*H. sapiens*) exhibited a longer neck and shallow groove for the flexor hallucis longus tendon area, with an overall stretched shape. PC2 (13,5%) is less informative, though a trend within the great apes sample can be observed from a flatter, longer positive shape to a rounder, shorter negative shape. Future work will include early hominin tali to shed light on the functional demands experienced by the ankle and the hindfoot during the evolution of hominin bipedalism.

LOCAL ANCESTRY ANALYSIS REVEALS THE “HUNTER-GATHERER” STRUCTURE OF SOUTHERN AFRICA

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Keywords: *Southern Africa Prehistory, Khoisan, Hunter-gatherers, Local Ancestry*

In the last few years, several investigations have provided important insights on the “Genetic Prehistory” of Southern Africa. Two main “San Ancestral Components” (SACs) have been suggested, characterized by an ancient divergence, and broadly correlated with geography.

However, for most of the Southern Africa populations, the actual characterization of SACs is complicated by the occurrence of later admixture events, involving Niger-Congo (Bantu speaking) and Euro-Asiatic (European and Eastern African) populations, which significantly shaped the current pattern of population structure. In order to provide a better characterisation of the genetic profile of Southern Africa populations, we analysed genomic data from ~650 individuals belonging to 18 populations. Through a genome-wide local ancestry approach we extracted genomic chunks with high probability of belonging to an ancestral San population and analysed these fragments using Principal Component Analysis (PCA) and genetic distance.

Our results a) show a complex San-related genetic structure, b) clarify the genetic composition of admixed populations such as Coloured and Bantu, and c) estimate the impact of admixture in the region.

**NEW DATA FROM ISERNIA LA PINETA (MOLISE):
THE OLDEST HUMAN FOSSIL SPECIMEN IN ITALY**

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Keywords: *Middle Pleistocene, European Peopling, Southern Europe, Deciduous Tooth*

The Isernia La Pineta site (south-central Italy, Molise) is one of the most important Early Middle Pleistocene archaeological sites in Western Europe. It is an extensive open-air site in a stratified context with abundant lithic industry and faunal remains distributed on four archaeosurfaces in two sectors (3c, 3a, 3s10 in sect. I, 3a in sect. II). The prehistoric settlement was located close to a wet environment, with a series of small waterfalls and lakes generated by calcareous tufa deposition.

In this exceptional context, an isolated human deciduous incisor (IS42) was found in the archaeological level 3 coll dated to the end of interglacial stage 15 thanks to new 40Ar/39Ar analyses.

The tooth, currently the oldest human fossil specimen in Italy, shows an overall good degree of preservation and marked occlusal wear. A detailed morphological and morphometric description is reported in this communication. Non-metric and metric traits were compared to data from literature belonging to modern humans, Neanderthals and Middle Pleistocene hominins.

The results of our comparative study highlight the presence of a unique combination of morphometrical and morphological features. However, in view of the scarcity and the high variability of European Middle Pleistocene juvenile human remains, the tooth has been provisionally assigned to an undetermined species of the genus *Homo*.

Together with the results of the new 40Ar/39Ar analyses, this discovery brings new data on the variability of Middle Pleistocene hominins and represents a window on the humans that settled in the Italian Peninsula around 600 ka.

**ANTHROPOLOGICAL ANALYSIS OF CREMATED REMAINS FROM THE LATE BRONZE AGE
CEMETERY OF SLATINA, CROATIA**

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Keywords: *Cremated Human Remains, Late Bronze Age Cemetery, Croatia, Slatina*

Late Bronze Age cemeteries in Croatia have rarely been subject of anthropological analysis, even though they are relatively numerous. This situation is starting to change with the introduction of synthetic treatment of anthropological and archaeological analyses. In this way, human cremated remains from the cemetery of Slatina in eastern Croatia have been analysed. The cemetery, consisting of 38 graves, belongs to the Urnfield culture and is dated to the 12th and 11th centuries BC. The cremated remains of the deceased were placed in various forms of ceramic receptacles functioning as urns.

Human remains were present in only 27 graves. All burials, except one, were single. The cemetery was used for burial of all members of the community. Anthropological analysis will provide data on age and sex of the deceased as well as pathological changes, thus creating demographic picture and health status of the community. Also, information about the funeral pyre will be collected: temperature of fire, collection and deposition of the remains. Grave goods will be associated with anthropological data in order to gain some insight into burial practices of this Late Bronze Age society. Results of anthropological analysis will be compared to available published data from other contemporaneous cemeteries in Croatia and surrounding regions.

THEORETICAL ASPECTS OF PHYSICAL-CHEMICAL PARAMETERS FOR THE CORRECT CONSERVATION OF MUMMIES ON DISPLAY IN MUSEUMS

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Keywords: *Mummies, Conservation, Museums, Showcases, Physical and Chemical Parameters*

This study is aimed at evaluating physical and chemical parameters, which are considered as the most appropriate for the long-term preservation of mummies, distinguishing between those, which are on display in museums and those, which are preserved in storage rooms.

The objective of this study is also to compare and discuss differences among the most widely known guidelines and norms of the field and to highlight the single phenomena, which affect the decay of this kind of cultural asset.

The parameters for the conservation of mummies on display in museums have been evaluated in documentation drafted by a number of standardization and regulatory bodies. Mummies are not a priority in the cultural heritage world and citations in the various field studies are not frequent.

In this study, the recommended physical parameters concerning the conservation of mummies are compared.

Before to apply the ideal parameters listed in this study, the purpose of the conservation of the mummy must be properly determined. These parameters are valid in all conditions except for conservation in storage rooms where public display is not a priority. In these circumstances it is necessary to eliminate any light or irradiation source, in addition to maintaining the threshold temperature at the lowest possible value.

TOWARDS A DEEPER DISSECTION OF THE ITALIAN GENOMIC LANDSCAPE

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Keywords: *Population Structure, Admixture, Local Adaptation, Italian Population*

A number of prehistoric and historical demographic processes, including long-range migrations and admixture, occurred along the Italian Peninsula due to its pivotal geographical location. In fact, it enabled direct connection between the Mediterranean area and several continental European regions, thus having long represented a natural hub for human population movements. Coupled with a patchy environmental landscape, this is supposed to have strongly influenced the genomic background of present-day Italians. It can be thus hypothesized that the interplay between neutral and adaptive evolution varied across the different human groups settled along the peninsula according to the occurrence of diverse selective pressures. This resulted in peculiar patterns of population structure and local adaptations to environmental and/or cultural factors.

To disentangle this complex evolutionary scenario, we examined a dataset of more than 500,000 genetic variants typed on around 800 Italian individuals by means of the Illumina CoreExomeChip. Samples were recruited from 20 different provinces to be as much representative as possible of the overall variation observable along the entire peninsula.

This led to the identification of genomic regions driving patterns of population structure and underlying local adaptations, some of which have crucial implications for the susceptibility to diseases of the Italian population.

The generated data were also compared with publicly available genome-wide genotypes retrieved for more than 1,000 individuals belonging to 50 different human groups. Accordingly, Italian variation was set into the context of the European and Mediterranean ones, enabling accurate investigation of the genomic relationships existing between the examined populations and of the possible events of gene flow occurred among them.

VARIABILITY IN ISOTOPIC VALUES RELATED TO POOR HEALTH STATUS IN ARCHAEOLOGICAL POPULATIONS

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Keywords: *Metabolic Disorders, Stable Isotope Analysis, Deficiency Status, Skeletal Alteration, Biomolecular Approach*

In the latest years, the stable isotope analysis (SIA) in the reconstruction of human palaeodiet has been extended to the pathological investigation, because several researches demonstrated the influence of metabolic disorders on $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values from bone collagen.

Malnutrition was probably one of the widespread difficulties of life in antiquity, whose effects on the bones, however, are based on nonspecific markers generally indicative of chronic defects in bone composition. The availability of a large skeletal sample represents a unique opportunity not only to investigate this issue in terms of stable isotope signatures related to deficiency status but also to quantify it at the intra and inter population level.

As a first task the osteological analysis recorded a series of skeletal alterations putatively correlated to malnutrition, whose description is well-known in literature (i.e. linear/focused enamel hypoplasia, porotic hyperostosis) and stable isotope analysis was performed accordingly.

Preliminary results allow us to consider the skeletal alterations not straightforwardly related to isotopic variation: in fact the phenotypic scenario seems to be poorly linked to nutritional status suggested by SIA.

DENTI, TARTARO E ANTICHI TESSUTI.
UN CASO DI ANALISI INTEGRATA PER L'INDIVIDUAZIONE DI ATTIVITÀ LAVORATIVE
NELL'ANTICA COMUNITÀ DI GRICIGNANO D'AVERSA (CAMPANIA, 2500-1750 BC)

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Keywords: *Usure Extramasticatorie, Tartaro, Fibre Tessili, Gricignano d'Aversa, SEM*

La ricostruzione degli adattamenti bioculturali e degli stili di vita delle popolazioni del passato acquista maggiore consistenza qualora effettuata secondo approcci interdisciplinari fondati su analisi integrate delle evidenze provenienti dalle diverse discipline biologiche e storico-archeologiche.

Tale linea d'azione ha contraddistinto il presente studio, finalizzato all'individuazione e caratterizzazione di una specifica attività lavorativa (la produzione di filati), all'interno dell'antica comunità di Gricignano d'Aversa (Eneolitico - Bronzo iniziale, Campania, Italia). Le analisi hanno riguardato il rilevamento e la descrizione delle modificazioni extramasticatorie dei denti e l'estrazione e la diagnosi di materiale vegetale fossile dal tartaro dentario.

L'analisi di 178 individui (3267 denti) ha rilevato una frequenza di solchi occlusali e paraocclusali a carico della dentatura anteriore, derivanti dalla lavorazione di fili di diverso diametro, nel 63,00% del campione femminile e nel 19,44% degli individui a sesso non diagnosticabile. L'osservazione microscopica sistematica al SEM ed in microscopia ottica delle repliche in resina epossidica delle dentature di tutti gli individui ha permesso di identificare la presenza di microtracce legate al passaggio del filo anche in individui giovani (15-20 anni), che non presentavano modificazioni visibili a occhio nudo.

L'analisi al SEM degli inclusi del tartaro prelevato dagli individui presentanti i solchi, ha permesso il recupero in due casi, delle fibre vegetali fossili, identificate come canapa (*Cannabis* sp.). Tale evidenza è corroborata dalla presenza tra i corredi di un tessuto dello stesso materiale, rinvenuto in una tomba maschile del sepolcreto.

**EARLY MODERN HUMAN DISPERSAL FROM AFRICA:
GENOMIC EVIDENCE FOR MULTIPLE WAVES OF MIGRATION**

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Keywords: *Human Demographic History, Migration, Evolutionary Divergence, Admixture, Linkage Disequilibrium*

It is unclear whether early modern humans left Africa through a major migration process, dispersing simultaneously over Asia and Europe, or in two main waves, first through the Arab peninsula into Southern Asia, and later through the Near East into Western Asia and Europe.

We collected a broad genome-wide SNP dataset in 71 populations to test if single (SD) or multiple (MD) dispersal model can better account for patterns of genome diversity. We found good correlations between geographic and genetic distances, but only insignificant differences between models.

We moved to consider the patterns of Linkage Disequilibrium in each population to estimate effective population size that allows us to assess when population pairs diverged in time. We showed that accurate genomic estimates of the divergence times between European and African populations are more recent than those between Australo-Melanesia and Africa, and incompatible with the effects of a single dispersal. Furthermore, we showed that this difference cannot possibly be accounted for by the effects of hybridization with archaic human forms in Australo-Melanesia. Simulated genetic polymorphism data demonstrate the validity of our conclusions.

We conclude that the hypothesis of a SD model from Africa appears hardly compatible with the observed historical and geographical patterns of genome diversity, since some populations retained the signal of an earlier dispersal.

WEIGHT STATUS IN WOMEN OF NORTH AFRICAN ORIGIN LIVING IN ITALY

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Keywords: *Weight Status, Immigrants, North Africa*

Immigrants from low-income countries are generally more susceptible to overweight than natives of host country. Little is known on nutritional status of women immigrated from North Africa to Italy. The purpose of this study is to analyze the prevalence of overweight/obesity in Italian female residents of North African origin to identify ethnic groups for preventative activities and to assess any trends towards obesity with the increasing in the length of residence.

This cross-sectional study was undertaken on 105 female migrants aged 18-60 years in Emilia-Romagna region (Italy) by an anthropometric survey. Length of residence was also evaluated by questionnaires.

The prevalence of overweight/obesity was high (79.8%) in comparison to Italian native-born women (26%).

Association of overweight to length of residence was also evaluated.

Our results indicate that anthropometric survey is fundamental to determine the risk of overweight in migrant groups and to promote interventions preventing unhealthy weight gains over the time.

**THE MIGRATION PERIOD IN EUROPE:
GENETIC ANALYSIS ON LOMBARDS SAMPLE**

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Keywords: *Ancient DNA, NGS, Indo-European, Late Neolithic, Kurgan*

Archaeological evidence shows a marked discontinuity in Late Neolithic farming societies in Europe: large settlements were abandoned, anthropomorphic figurines and painted pottery disappeared. Some scholars, as Gimbutas, interpreted these changes hypothesizing a migration of pastoral groups from the steppes of southern Ukraine, also associated with the spread of proto-Indo-European languages (Kurgan hypothesis). The Globular Amphora culture assumes a crucial role in this theory. It was distributed across central and eastern Europe, from the Elbe to the middle Dnieper, around 3400-2800 BC and was characterized by an apparently mobile economy, presence of domestic horse, distinctive pottery and burial rituals. Furthermore, the physical type of the Globular Amphora population was regarded as similar to those of the steppe region. Alternative explanations have been put forward for the spread of Indo-European languages, including Renfrew's theory based on the Neolithic demic diffusion, and the Armenian hypothesis by Gamkrelidze e Ivanov. We selected 17 individuals from the Megalithic barrow of Kierzkowo (Poland, Kujawy-Pomorze), an excellent example of rituals of the Globular Amphora culture. We are applying advanced molecular procedures based on Next Generation Sequencing and target enrichment in order to analyze genetic variation in this community. Our aim is to contribute to the Indo-European debate, by comparing our data with the available genetic data about ancient and modern Europeans, quantifying population relationships, and testing for the possible demographic implications of the Kurgan hypothesis upon the Globular Amphora culture.

**PERFORMANCE IN COMPETITIVE RUNNERS:
ANTHROPOMETRIC, GENETIC AND PSYCHOLOGICAL FACTORS**

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Keywords: *Sprinters, Anthropometry, Genetic Polymorphism, Performance*

Sports performance is the result of interactions among body constitution, motivation and training. The purpose of this study was to assess the influence of anthropometric traits, psychological components and genetic factors on performance in sprint running. The sample consisted of 104 Croatian runners of both sexes. Nine anthropometric measurements were taken according to the standardized procedure and anthropometric indexes were calculated. Competitive State Anxiety Inventory-2 (CSAI-2, Martens et al., 1990) was submitted to each subject. Athletes completed a self-questionnaire on personal best times, one repetition maximum in clean, and best performance in standing long jump. The ACE (I/D) gene polymorphism was determined using polymerase chain reaction (PCR) method. A multivariate analysis between personal best time and all traits collected on each athlete was carried out separately in both sexes. The results demonstrated that some anthropometric characteristics and psychological components had a beneficial effect on performance. An association between ACE gene variation and performance was found. Still, the effects of examined traits on performance were different in male and female athletes. In conclusion, our findings confirm that multiple different factors are related to performance in sprint runners. Further research is needed to increase understanding about the influence of other important factors, such as training, competition level and the interactions among factors.

Poster Presentations



**ANTHROPOLOGICAL ANALYSIS OF SCATTERED HUMAN BONES FROM COVOLO DEL TESCHIO
AND COVOLO DEL BRONZO (BREONIO, VR)**

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Keywords: *Bronze Age, Bioarchaeology, Human Skeletal Remains, Italy*

Funerary evidences known for the Early Bronze Age in Northern Italy are extremely complex, including different modes of deposition.

The two caves of Covolo del Bronzo and Covolo del Teschio, located along Vajo Nogarole (a narrow valley in Lessini mountains), fit perfectly into this complex frame, attesting the rite of collective secondary burial in cave. It is part of an ancient tradition dating back to the Copper Age and found mainly in sub-Alpin and Alpin areas of Lombardia and Veneto regions.

The funeral rite included an initial exposure of the body until it was completely decomposed. Thereafter, some bones were collected and placed inside a cave, often accompanied by funeral offerings. The peculiarity of these depositions are represented by the absence of the anatomical connection and, sometimes, by a selection of some skeletal districts.

The two studied caves showed two different contexts: only two fragments of human parietal bone and a heel were found in Covolo del Teschio, while a greater amount of human remains were scattered throughout the site in Covolo del Bronzo. In both caves, numerous animal bones were present around the human bones.

The anthropological analysis allowed the determination of the minimum number of individuals and the definition of their biological profile. Moreover the attention was directed to the presence of pathologies and to the analysis of skeletal markers of occupational stress.

Our findings can contribute to better understanding the archaeology of death in the ancient Veneto, shedding light on particular burial rites of the Bronze Age.

**GROSS MOTOR SKILLS IN PRE-SCHOOL CHILDREN OF FERRARA
(EMILIA ROMAGNA, ITALY)**

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Keywords: *Gross Motor Skills, Pre-School Children, Ferrara*

Gross motor skills are a fundamental objective of physical activity programs in primary education. The purpose of this study was to estimate gross motor skills in pre-school children according to sex, age, and physical activity participation (self-reported). The sample consisted of 189 children (100 females and 89 males), 5-6 years old, attending council preschools in Ferrara (Emilia Romagna, Italy). The Test of Gross Motor Development (TGMD, Ulrich 1985) was used to assess 7 locomotion skills (run, gallop, hop, leap, horizontal jump, skip and slide) and 5 object-control skills (two-hand strike, stationary bounce, catch, kick and overhand throw). Videotaped performances were assessed by the same observer. Each skill was executed three times and evaluated on the basis of the presence (success, score 1) or absence (failure, score 0). In pre-school age, girls played sports more than boys. Girls preferred individual sports, while males played team sports (especially football and basket). The TGMD scores showed no difference between sexes, however, in both the age classes, females had higher locomotion skills and males had more advanced object-control skills. As expected, results showed that both sexes children, aged 6 years, had significantly higher performances in locomotion skills, handling skills and gross motor ability ratio in comparison to children aged 5 years. TGMD showed that the males that played sports had higher object-control scores and better motility. Moreover, data support the importance of sports participation for well development of gross motor ability in children.

**A RITUAL DEPOSITION IN THE PREHISTORIC SITE OF GROTTA DELLA MONACA
(CALABRIA, ITALIA)**

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Keywords: *Grotta della Monaca, Paleolithic, Ritual Deposition, Human Ulna*

Grotta della Monaca is a karstic cave set in the north of Calabria region, near the coast of Tyrrhenian Sea. The hypogean system is 500 metres long. It is characterized by several chambers and culverts diverging in size and shape. The cave was attractive to Man from Paleolithic to Medieval times, especially during Late Neolithic and Copper Age, because of its mineral resources. Iron oxides (goethite and hematite) and copper carbonates (malachite) were intensely mined in this period. Recent archaeological excavations are conducted in the area called "Pregrotta" according to topographic map of the site. Findings allowed to identify an human ulna intentionally deposited into a recess of the goethite vein, under a boulder. Radiocarbon analyses date the ulna to 18250-17800 BC cal 2 σ (84.6%) / 17750-17600 BC cal 2 σ (10.8%) (LTL3580A - 16761 \pm 100 BP). Therefore datings attributed this skeletal remain to Upper Paleolithic. This atypical deposition requires in depth-analyses to explain its meaning and purpose. The comparison with others analogous cases in Italy and Europe allows us to interpret it as a ritual deposition.

THE UPPER PLEISTOCENE OCCUPATION OF THE CIOTA CIARA CAVE (BORGOSIESA, VC)

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Keywords: *Upper Pleistocene, Northern Italy, Middle Paleolithic, Lithic Industries, Faunal Remains*

In 2009 the University of Ferrara, in collaboration with the Soprintendenza per i Beni Archeologici del Piemonte, has started the systematic excavations in the Grotta della Ciota Ciara (Borgosesia, VC). Three main stratigraphic units have been investigated (SSUU 13, 14 and 15), the sediments are mainly composed by a sandy-silt matrix with altered limestone rocks of centimetric and decimetric dimensions.

The faunal assemblage is dominated by *Ursus spelaeus* and *Ursus arctos*. Other carnivores (*Panthera leo*, *Panthera pardus*, *Lynx lynx*, *Canis lupus*, *Vulpes vulpes*, *Meles meles*, *Martes martes*) are also represented. The herbivores are represented by *Rupicapra rupicapra*, *Cervus elaphus*, *Stephanorhinus* sp. And *Bos* sp. The archeozoological analysis allowed to recognize several cut marks mainly on *Ursus* remains, probably related to skinning activities.

The micromammals analysis has allowed to attribute the investigated SSUU to a temperate period of the MIS 5 (70-80 Ka) mainly on the basis of the presence of *Pliomys coronensis*.

The lithic production has been performed on local raw materials: quartz and flint, collected in the proximity of the site. The most part of the lithic production have been made using an opportunistic (cf. SSDA) method, secondarily by Levallois and discoïd debitage.

The Ciota Ciara Cave represent the most complete evidence of the prehistorical occupation of the Piemonte Region. The interdisciplinary approach allowed to underline different types of occupation in terms of duration and surrounding exploitation.

**PALAEOBIOLOGICAL ANALYSIS OF THE MEDIEVAL CEMETERY OF LEOPOLI-CENCELLE
(VITERBO, ITALY)**

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Keywords: *Leopoli-Cencelle, Middle Ages, Palaeobiology*

The main purpose of the present work is to obtain palaeobiological information about the skeletal remains, brought to light, during the excavation campaign, directed by Sapienza University of Rome, at Leopoli-Cencelle, a medieval town founded in 854 by Pope Leo IV.

In particular, object of this work are burials brought to light during 2013 excavation campaign, different burials phases can be identified but those remains dates back to the XIII-XIV century, at that time the use of earthen graves was more frequent within additional soil accumulation layers, intensively taking up space, overlapping and cutting across each other.

The sample is composed by 96 individuals: 69% adults and 31% subadults. Sex estimation has been performed only on adult individuals: 42% females, 38% males, 18% has not allowed sex estimation because of the poor state of preservation whereas 2% has been classified as "indefinite".

Females show a more frail physical structure but both sexes have high-developed musculoskeletal markers on lower limbs. Estimated stature for females is 157,30 cm, for males 166,96 cm.

Palaeopathological analysis is still going on but data seem to show a fairly widespread of degenerative and infectious diseases. Dental study suggests the presence of extramasticatory activities witnessed by a marked wear on mandible teeth.

CONSEGUENZE DELLA NEOTENIA DELL'ENCEFALO SULLA DEREGULATION DELLA FUNZIONE ALIMENTARE NELL'OCCIDENTE GLOBALIZZATO

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Keywords: *Neotenia, Encefalo, Funzione Alimentare, Culture Occidentali*

La relatrice prosegue la sua ricerca sulla neotenia umana (*Bertocchi A. 2006*) sviluppando il tema delle conseguenze del suo aspetto più rilevante, quello dell'encefalo, sulla hybris alimentare. Infatti la nostra specie, rispetto agli altri animali superiori, possiede un cervello immaturo, che rende le reti neurali suscettibili di plasmarsi con l'esperienza, Tra di esse i circuiti dei neuroni specchio che, nella specie umana si complessificano nella funzione detta "simulazione incarnata" che consente di capire ciò che fanno o percepiscono gli altri, simulandolo nella nostra mente. La neotenia cerebrale tesse relazioni dinamiche fra ambivalenza emotiva e processi cognitivi stimolando sentimenti contrastanti verso lo stesso oggetto, come: amore/odio - attrazione/repulsione - invidia/generosità - empatia/indifferenza. Essa è di per sé destabilizzante per la psiche e, se lasciata a sé stessa, interferisce nelle capacità di valutazione e decisione. L'origine di questa innovazione co-evolutiva, è stata ricercata nel restringimento della forma del bacino nella donna, avvenuto con il passaggio alla stazione eretta, che le ha provocato problemi di parto e ha spinto la pressione selettiva a favore di crani meno ossificati e più prematuri, il cui completo sviluppo, avviene dopo la nascita. Per decine di migliaia anni la specie umana ha risolto i problemi dell'ambivalenza emotiva con forme complesse di ritualizzazione, che consentivano di tenere sotto controllo ogni forma di hybris. Ma con la decadenza delle codificazioni mito-rito, le popolazioni dell'occidente globalizzato, non sono più riuscite a rispettare i limiti della carrying capacity, e si sono perse nelle più diverse patologie della funzione alimentare.

GLI INUMATI DI ETÀ MEDIEVALE DI MODENA-NOVI SAD: ANALISI PALEOBIOLOGICA, PALEODEMOGRAFICA, PALEOPATOLOGICA E PALEONUTRIZIONALE NEL QUADRO DEL POPOLAMENTO DELL'EMILIA-ROMAGNA

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Keywords: *Medioevo, Emilia-Romagna, Bioarcheologia, Confronto Di Popolazioni*

Le fonti archivistiche ci informano che, nel 1245, l'area, indicata come "*inter portas Citanovae et Ganaceti supra foveam civitatis*", di Modena fu occupata dal monastero di Romitani, un istituto che dovette restare in funzione per poco tempo. Il complesso dei Romitani mostra una planimetria piuttosto comune, con una serie di edifici disposti attorno al chiostro che includevano una chiesa piuttosto modesta. Le fonti archivistiche sottolineano il divieto per l'edificio religioso di svolgere funzione parrocchiale e cimiteriale, ma, nonostante le prescrizioni, sono state individuate 47 sepolture, in prevalenza all'interno degli spazi monastici. Sono state rinvenute: una tomba entro la supposta chiesa (T. 65), 15 tombe nei corridoi del chiostro (TT. 7, 8, 9, 58-61, 66-73), 26 tombe nel cimitero annesso al monastero (TT. 5, 6, 10, 64, 74-81, 83-98), di cui due tombe privilegiate in muratura con copertura a spiovente (TT. 5, 6, 10). Il campione antropologico consiste in 58 individui provenienti da tombe singole, bisome e multiple e da alcune US: 31 maschi e probabili maschi, 21 femmine e probabili femmine, solo 4 *juvenes* e 2 soggetti di sesso indeterminato che sono stati confrontati con altre serie coeve dell'Emilia Romagna. I valori staturali medi sono di 171,8 cm per i maschi e 162,5, per le femmine. Le patologie più comuni sono quelle dentarie, artrosiche e da carenza e frequenti sono anche alcuni indicatori di stress scheletrico.

**LE SEPOLTURE ALTO-MEDIEVALI DI ANDRAZZA-FORNI DI SOPRA (UDINE)
NUOVI DATI PALEOBIOLOGICI E REVISIONE DELL'ETÀ ALLA MORTE DEI SOGGETTI
TRAMITE IL METODO CAMERIERE**

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Keywords: *Medioevo, Friuli Venezia Giulia, Bioarcheologia*

Alcune notizie risalenti all'ultimo decennio del XIX secolo, derivate dalle indagini di scavo di Alexander Wolf, indicavano l'abitato di Andrazza, una delle borgate del comune di Forni di Sopra (UD), come luogo di rinvenimento di reperti relativi a una necropoli di età longobarda.

Le indagini sistematiche, condotte dal 2008 al 2011, hanno permesso di scavare finora una ventina di sepolture singole in fossa terragna. Le tombe, spesso disposte affiancate, con orientamento differenziato, risultavano talvolta delimitate da ciottoli di fiume. Quasi tutte le sepolture possedevano interessanti elementi di corredo, che ad un'analisi preliminare possono essere complessivamente ascritti ai secoli VI-VIII. Il cattivo stato di conservazione del materiale scheletrico non ha consentito di rilevare che poche misure del cranio e dello scheletro postcraniale. Si è comunque notata l'alta frequenza di alcuni caratteri "discontinui" del cranio e si sono rilevate patologie dentarie e scheletriche, tra cui un tentativo di trapanazione cranica conseguente a un trauma. Si è ordinato il materiale e calcolato il NMI per i soggetti sepolti nella tomba 1, quelli rimasti ancora *in situ* dopo le indagini ottocentesche del Wolf, e si è rivista la determinazione dell'età, applicando il metodo Cameriere alla dentatura dei soggetti adulti.

**EGYPTIAN MUMMIES IN THE COLLECTIONS OF THE MUSEUM OF ANTHROPOLOGY AND
ETHNOGRAPHY AT THE UNIVERSITY OF TURIN: RESEARCH AND CONSERVATION**

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Keywords: *Egyptian Mummies, Museum, Conservation, CT Scan*

The ancient Egyptian anthropological collection of the Museum was built up by Giovanni Marro (1875-1952) during the Italian Archaeological Mission in Egypt, from 1911 to 1937. More than 650 complete skeletons and 1300 isolated skulls, 80 heads of mummies, 5 complete predynastic mummies and 15 dynastic ones are stored in the Museum. The aim of this work is to demonstrate that, despite several decades of research, there is still much to be learned about the biology and paleopathology of these specimens, especially thanks to advances in analytical, biological and imaging techniques. In particular, multiple detector computed tomography (MDCT) with post-processing tools like multiplanar and three dimensional reconstructions confirmed its role in the non invasive study of wrapped mummies and its contribute to the cultural heritage providing important information in anthropological, medical, ethnological studies of mummies and their conservation. We present some unpublished results regarding embalmed mummies analyzed by CT scan.

**FROM THE TYRRHENIAN TO THE ADRIATIC SEA.
DISENTANGLING GENETIC STRATA IN CENTRAL ITALY**

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Keywords: *GenoChip, Italian Central-Northern Apennines, Genetic Strata, Metal Ages*

Studies based on uniparental markers revealed that the genetic structure of continental Italy is characterised by a main North-West/South-East discontinuity pattern, whose demarcation line is substantially longitudinal and supposed to be originated between the late Neolithic and the Metal Ages.

In order to better explore the riddle of events which caused the present-day pattern, we adopted a genome wide approach by sampling a set of populations from Northern Apennines (Central Italy) characterised by different demographic and eco-geographic traits. A total of 259 individuals from 11 populations, carefully selected on the basis of historical residency, were genotyped at about 150,000 autosomal ancestry informative markers (AIMs) by the GenoChip (National Geographic Society, Washington, DC & Family Tree DNA, Houston, Texas, USA). Results were compared with a set of selected reference populations from the Mediterranean domain.

Exploratory analyses (PCA, Admixture, EEMS) showed that populations from Northern Apennines form a homogeneous cluster mostly related with Corsica and Spain, while being well separated from Sardinia, Southern Italy and Sicily. Interestingly, all Italian populations share two admixture components. One dominates Sardinians (hence mainly Neolithic as origin) and the second one, almost exclusive of continental Italy and Sicily, reaches its frequency peaks in Central-Northern Apennines. The rest of the AIMs are shared with other Mediterranean populations, in particular from Spain and the Balkans.

Our results emphasize the emerging role of Apennines as an area of conservative genetic traits which may help to identifying ancient genetic strata of Italy.

**ANALISI MICROSCOPICA DELLO SMALTO DENTARIO:
METODOLOGIE SPERIMENTALI E NUOVE PROSPETTIVE**

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Keywords: *Smalto, Cronologia, Età alla morte, LA-ICP MS, Linea Neonatale*

Lo smalto dentario, grazie alle sue caratteristiche di registratore permanente di eventi di accrescimento e all'alto grado di mineralizzazione, è substrato ideale per testare tecniche puntuali volte a definire le sequenze temporali e la regolarità dell'accrescimento individuale.

L'analisi microscopica della struttura fine di questo tessuto, consente lo studio di problematiche di interesse antropologico:

1. nei denti permanenti è possibile determinare la sequenza cronologica della formazione delle corone che, abbinata ai dati della LA-ICP MS, fornisce informazioni circa la concentrazione di isotopi ed elementi chimici in tracce,
2. nei denti decidui e nel primo molare permanente l'individuazione della linea neonatale e la misurazione dello spessore dello smalto postnatale nonché della radice, consente la determinazione dell'età alla morte di individui infantili con i denti ancora in formazione.

Nel primo caso sono stati analizzati 6 canini permanenti (necropoli di Mehrgarh, Pakistan VII-VI millennio a.C.) su cui sono state delineate tracce di LA-ICP MS lungo la giunzione smalto-dentina. La cronologia è stata ricostruita lungo questa traccia, applicando il metodo Guatelli-Steinberg e collaboratori (2012).

Nel secondo caso è stato esaminato il campione infantile dalla Necropoli di Velia Porta Marina (Campania I-II secolo d.C.). Per quegli individui definiti "perinatali", è stato possibile, dimostrare che essi, non mostrando evidenza di linea neonatale, sono morti al momento della nascita. Per quegli individui di età inferiore ai 5 anni, l'analisi di incisivi e canini ha mostrato in generale una buona concordanza con il dato dell'analisi morfologica dello scheletro, permettendo di assegnare un'età più puntuale, al livello delle settimane.

POLIMORFISMI GENETICI E ALCOL: UNO STUDIO SULLE POPOLAZIONI ITALIANE

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Keywords: *Alcol, Marcatori Autosomici, Fattori Socio-Culturali, Territorio Italiano*

Gli eventi migratori e i flussi genici di cui la penisola italiana è stata teatro a partire dal periodo neolitico, hanno contribuito a delineare l'attuale variabilità genetica della popolazione favorendo un certo grado di strutturazione lungo il suo l'asse longitudinale. Tale complessità popolazionistica emerge da numerosi studi genetici che hanno sfruttato le potenzialità dei marcatori ad evoluzione neutrale (mtDNA e cromosoma Y). Tuttavia, ancora poco conosciuta rimane la variabilità dei marcatori autosomici. Tra questi, i polimorfismi legati all'uso/abuso di alcol possono essere di particolare interesse. I dati fino a questo momento disponibili sono relativi a varie popolazioni, sia europee che extraeuropee, ma ancora scarsi sono i lavori per ciò che riguarda il territorio italiano. Diversi fattori psicologici, socio-culturali, storici e genetici possono interagire e delineare le caratteristiche fenotipiche di soggetti più o meno inclini all'uso di alcol.

Il progetto si propone di valutare nella popolazione italiana la distribuzione di 37 varianti geniche che da precedenti studi sono state associate all'uso/abuso di alcol e di identificare patterns eventualmente legati a elementi di natura storica e/o socio-culturale.

Verranno quindi tipizzati circa 500 individui che identificano le principali macroaree del territorio italiano (Nord, Centro Sud e Isole). I dati ottenuti dall'analisi genetica verranno messi a confronto sia con i dati genetici relativi a marcatori uniparentali ad evoluzione neutrale sia con i dati relativi alle consuetudini di produzione e consumo di bevande alcoliche a livello regionale.

3D ENAMEL THICKNESS IN NEANDERTALS AND *HOMO SAPIENS* PERMANENT LOWER CANINES

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Keywords: *Homo sapiens*, *Homo neanderthalensis*, 3D Enamel Thickness, Lower Permanent Canines, Micro Computed Tomography

Enamel thickness figures prominently in studies of human evolution, particularly with hominoid taxonomy, phylogeny, and paleodiet. Attention has focused on molar teeth, recently utilising advanced technologies with novel protocols. Despite important results achieved thus far, further work is needed to investigate all tooth classes. We apply a recent approach developed for anterior teeth to investigate 3D enamel thickness of hominin canines.

MicroCT data of 38 unworn/lightly worn *Homo sapiens* (Early: n= 4, Upper Paleolithic: n=4, Recent: n=21) and Neandertal (n=9) permanent lower canines were segmented using Avizo 7 to reconstruct 3D digital models of the teeth. The cervical line was digitized on each 3D model using the spline function in Rapidform XOR2 to separate crown from root dentine. Volumes of enamel and of crown dentine, and the enamel-dentine junction surface were measured to compute Relative Enamel Thickness (RET).

Mean RET value for Neandertals (12.7±1.8) falls below the mean computed for *H. sapiens* (Upper Paleolithic=15.6±2.9, Early=14.0±1.9, Recent=15.5±2.6). A permutation test between Neandertal and Recent humans confirms the significance of this difference in RET ($p=0.0055$), an effective index for the taxonomic discrimination between modern humans and Neandertals. This preliminary study confirms this trend for lower permanent canines, using a 3D protocol that is reproducible, has little subjectivity, and is particularly effective for the uneven contour of cervical enamel in anterior teeth.

Future contributions will allow for increased sample size, including worn teeth to investigate if the RET index still discriminates between Neandertal and *H. sapiens* canines.

**LA MUMMIA DI YOUSSEF BEY KARAM (1823-1889), EROE NAZIONALE LIBANESE:
ANTROPOLOGIA E CONSERVAZIONE**

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Keywords: *Mummia, Conservazione, Paleopatologia*

L'eroe nazionale libanese Youssef Bey Karam, teorizzatore dell'identità culturale e dell'autonomia della nazione libanese, morì in esilio in Italia nel 1889 ed il suo corpo fu trasportato da Napoli a Tripoli (Siria), dove fu verificato il suo stato di mummificazione. La mummia, oggi conservata nella cattedrale cristiano-maronita di St. Georges ad Edhen, Libano Nord, versava in un grave stato di degrado. Gli antropologi del nostro Museo hanno ricevuto e svolto nel 2012-14 l'incarico di eseguire lo studio antropologico e la conservazione definitiva di questa mummia. L'incarico ha comportato una prima fase di ricognizione svolta sia rintracciando i documenti sanitari relativi alla morte ed all'esportazione del cadavere (presso l'Archivio di Stato di Napoli) sia analizzando le cause del degrado nel luogo di conservazione. Le analisi (macroscopiche, istologiche, radiografiche, tomografiche e microbiologiche) hanno consentito di accertare le cause della morte (arresto cardiaco), le malattie in vita (fratture costali consolidate) ed il processo di mummificazione (essiccamento naturale), nonché le cause del degrado (proliferazioni micro-fungine conseguenti ad elevata umidità). Una ricostruzione dell'aspetto facciale in vita, eseguita con i metodi classici dell'antropologia forense, ha consentito la realizzazione e la calzatura sulla mummia di una maschera facciale in resina. Il processo di disinfezione e disidratazione è stato messo in atto mediante applicazione di un nuovo standard e la conservazione definitiva è avvenuta utilizzando un brevetto registrato del nostro Museo, con realizzazione di una cassa di vetro a tenuta stagna con atmosfera di azoto secco. È stata così restituita al culto una reliquia centrale della cristianità Medio-orientale.

**THE OSTEOLOGICAL COLLECTION OF *INFANS* AT THE LABORATORY OF ANTHROPOLOGY
OF THE UNIVERSITY OF PALERMO**

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Keywords: *Human Osteology, Comparative Collection, Infans Bones*

The importance of human osteological comparative collections is well known, both for studies in bio-archeology and bio-demographics, in order to evaluate comparatively the growth rates, health parameters, and other parameters related to population variability. In the same time these collections are fundamental in forensic anthropology. The value of a collection increases, *a fortiori*, when an homogeneous sample, selected from a demographic point of view, is representative of specific population. Generally speaking, the construction of a collection of skeletons of children is difficult for a number of reasons, ranging from ethical and cultural reasons to differential taphonomy. For many years the Laboratory of Anthropology in Palermo has conducted a comparative collection of modern human skeletal materials, both adults and *infans*. In this work we present to the scientific community our collection of *infans*, consisting currently of 236 samples from Western Sicily, identified by both sex and age.

**PALEOGENETICS OF ST2. THE FIRST aDNA ANALYSIS OF UPPER PALAEOLITHIC
HUNTER-GATHERER FROM SICILY**

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Keywords: *Upper Palaeolithic, Grotta di San Teodoro, Ancient DNA*

The Upper Palaeolithic remains from Grotta di San Teodoro represent the oldest and largest human skeletal sample yet found in Sicily. Inside the cave, during different and not continuous field excavations carried out in the 1937-1947 decade, seven human adults have been discovered. They were mostly attributed to the earliest Epigravettian explorers that arrived in Sicily crossing the Messinian strait. Morphometric analysis demonstrated their relationship with continental modern humans, in particular with humans bearing Magdalenian culture. Furthermore, morphological analyses suggest certain continuity in cranial morphology during the Palaeolithic-Mesolithic period in Sicily. In order to better understand the earliest peopling of Sicily and their relationship with subsequent Mesolithic hunter-gatherers, we sampled the ST2 cranium for ancient DNA analysis and compared the extracted DNA with DNA data recently obtained for the Mesolithic hunter-gatherers from Favignana. ST2, discovered by Bonafede during the first field campaign (1937) and unearthed by Graziosi and Maviglia in 1946, is a complete cranial sample attributed to a male, housed at the Gemmellaro Geological Museum of the University of Palermo. As the other specimens, the ST2 skeleton was intentionally buried near the ST1 skeleton, which was recently dated by AMS 14C 15232-14126 cal. BP. Paleogenetic analyses on ST2 were conducted in a exclusively dedicated laboratory for ancient DNA work. Following the most stringent current protocols for validation of ancient DNA, we obtained endogenous sequences of mitochondrial DNA. In the light of these preliminary results we consider ST2 a good candidate for more innovative genomic analyses, like capture approaches.

**FALSI MITI E NUOVE SCOPERTE. COME L'ANTROPOLOGIA HA CONTRIBUITO A CAMBIARE
LA VISIONE TRADIZIONALE DELLE POPOLAZIONI DELL'ETÀ DEL BRONZO**

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Keywords: *Cremazioni, Demografia, Parentela, Rituale, Età del Bronzo*

Oltre vent'anni di ricerche condotte su alcuni campi d'urne dell'età del bronzo italiana sono risultate decisive per la comprensione delle dinamiche demografiche e sociali che hanno interessato in pianura padana il ciclo storico delle Terramare e il passaggio ai centri protourbani durante il secondo millennio a.C.

Com'è noto le necropoli a cremazione costituiscono il più precoce esempio di aree funerarie molto estese, sia in termini spaziali, sia come numero di sepolture (nell'ordine delle centinaia). Esse perciò si configurano come serie campionarie fortemente rappresentative dal punto di vista demografico.

Sono state analizzate più di 800 sepolture provenienti dalle necropoli di Casinalbo (Modena), Montata (Reggio Emilia), Scalvinetto (Verona), Narde di Frattesina (Rovigo), determinando in molti casi il sesso e l'età alla morte degli individui, nonostante i limiti imposti dalla natura stessa del materiale cremato, e rivelando molti aspetti non immediatamente evidenti del rituale funerario, fra questi, l'esclusione dal rito crematorio e dall'area funeraria dei bambini d'età inferiore ai 2-3 anni.

L'integrazione con i dati archeologici, in particolar modo con la distribuzione spaziale e cronologica delle tombe di Casinalbo, ha consentito di ricostruire i trend demografici della comunità e le strutture parentelari dei gruppi che la articolavano.

I risultati della ricerca hanno messo in discussione la visione tradizionale delle società di incineratori dell'età del bronzo, storicamente considerate fortemente egalarie per l'apparente omogeneità che caratterizzava il tipo di rituale, la tipologia degli ossuari e i pochi oggetti presenti nelle tombe.

**STIMA DELLA DATA DELLA MORTE ATTRAVERSO IL RIMODELLAMENTO ALVEOLARE:
A CASE REPORT**

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Keywords: *Perdita Dentale Antemortem, Istologia Ossea, Antropologia Forense*

L'estrazione chirurgica dei denti a causa di patologie dentarie è una procedura relativamente comune nell'uomo moderno. La guarigione della ferita risultante avviene in modo progressivo, stadiato, e l'analisi del processo riparativo può essere di grande utilità in una indagine forense effettuata su resti umani. Il seguente studio illustra un caso particolare dove lo stadio di riparazione alveolare ha permesso di stimare con un certo grado di precisione il periodo di tempo trascorso tra l'estrazione chirurgica *antemortem* di un dente ed il momento della morte di quella persona. Il cadavere, appartenente a una donna di 34 anni, era in avanzato stato di decomposizione ed in gran parte scheletrizzato. L'esame macroscopico, radiografico ed istologico della mandibola ha evidenziato il rimodellamento osseo in fase iniziale dell'alveolo del primo molare sinistro, che si caratterizza per (i) una leggera riduzione dell'altezza verticale della superficie vestibolare rispetto alla teorica posizione originale del dente, (ii) il riassorbimento del setto intra-alveolare e della lamina dura, e (iii) la formazione di nuovo osso immaturo che ricopre l'intera superficie interna dell'alveolo. Lo studio ha permesso stabilire che la morte del soggetto è avvenuta 19-23 giorni dopo l'estrazione del dente. Conoscendo la data dell'estrazione del dente fornita dalle indagini di Polizia, è stato possibile stimare la data più probabile della morte del soggetto.

LACK OR UNCERTAINTY OF BIRTH DATA AND CONSEQUENCES ON MALNUTRITION ESTIMATES IN SUB-SAHARAN AFRICA

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Keywords: *Birth Registration, Malnutrition, Sub-Saharan Africa*

An exact knowledge of age is necessary for assessing nutritional status. Nevertheless, 250 million children under five years do not have their birth registered, especially in sub-Saharan Africa and South-East Asia. We examined the effects of the lacking or imprecise knowledge of age on malnutrition prevalence.

Birth registration rates, stunting, wasting, and underweight prevalences were retrieved from Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) of 37 sub-Saharan African countries. The composition of the sample used for nutritional evaluation was analysed using a permutation test. Logistic regression was applied to analyse the relationship between BR and malnutrition. The 95% probability intervals and t-Student test were used to evaluate the effect of age bias and error.

Registered children showed a better nutritional status than unregistered ones, even within groups with similar socio-economic conditions. Registered children were generally slightly more represented in the samples analysed for nutritional assessment than in the total one. This sampling error can cause the underestimation of malnutrition estimates. Systematic over- or under-estimation of age (the latter being more probable with undernourished children) showed to, respectively, over- or under-estimate malnutrition (up to 28%). Age imprecision showed to slightly overestimate malnutrition.

The lacking or imprecise knowledge of age can lead to underestimate the prevalence of malnutrition. While DHS and MICS remain the best sources of demographic and health information in low- and middle-income countries, procedures for nutritional assessment should be reviewed for applications in regions where registration at birth is still uncommon.

THE DEAD FRAGMENTATION: SKULLS DEPOSITIONS IN DOMESTIC CONTEXTS DURING THE LATE NEOLITHIC CULTURE OF MICHELBERG IN CENTRAL EUROPE

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Keywords: *Neolithic, Michelsberg, Human Remains, Skulls, Secondary Treatments*

From the last phases of European Neolithic, we know several human remains detained outside the funeral context. The large incidence of this kind of discoveries, lead us to think that many human skeletons have undergone possible secondary treatments, probably after the decomposing of putrescible elements. In this regard, the Michelsberg culture is one of the most significant late Neolithic periods. The distribution of this culture, dated between the late fifth and the first half of the fourth MA B.C., covers a wide area including the Central Western Europe from northern France to part of Germany and central Bohemia. Data concerning the Michelsberg funerary practices, show an anomalous situation if compared with other Neolithic periods. The most important phenomenon of this culture, in fact, is the presence of partial human bodies and isolated bones, particularly skulls, lying in ditches and pits of enclosures sites. The recurring presence of human bones plays a fundamental role. Who were these people? Why they were in store for this kind of depositions? Were they enemies or people of higher lineage? Traces of intentional manipulations, such as signs of cutting and scraping, were found in some skulls, calotte and mandibles. One of the most known manipulations is the famous skull-trophy at Ilsfeld, in Bruchsal, Germany, which shows signs of deterioration from weathering and deliberate enlargement of the foramen magnum. In the site of Hetzenberg, in Germany, was found an isolated human jaw with two symmetrical holes at the extremities. Was it worn as a pendant? It's difficult interpret these findings, although they prove the existence of secondary practices such as fragmentation and manipulation of the human skeleton.

**THE MCT1 A1470T POLYMORPHISM IS ASSOCIATED WITH FAT-FREE MASS
AND MUSCLE INJURIES IN PROFESSIONAL SOCCER PLAYERS**

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Keywords: *Lactate, SNP, Body Composition, Injuries, Soccer*

Introduction. The A1470T polymorphism (rs1049434) in the monocarboxylate (lactate/pyruvate) transporter 1 gene (MCT1) has been suggested to influence sport performance in athletes and in general population. The aim of this study was to investigate whether the MCT1 A1470T polymorphism was associated with fat-free mass and with muscle injuries in young Italian elite soccer players.

Methods. Fifty-four male professional soccer players were recruited during four seasons (2009-2013). The fat-free mass was estimated *by* plicometry. Genotyping for the MCT1 A1470T polymorphism was performed using PCR and specific restriction enzyme.

Results. The percentage of fat-free mass was significantly higher in soccer players with TT genotype and in the T-allele-dominant model group than in the athletes with AA genotype. Moreover, athletes with a TT genotype had significantly ($P = 0.046$) higher incidence of injuries (0.98 ± 1.2) than individuals with a AT (0.19 ± 0.3) or AA (0.26 ± 0.6) genotypes. The MCT1 genotype, weight and age accounted for 24% of severity of injuries.

Conclusions. These results suggest that the MCT1 T allele is associated with the fat-free mass and could have influenced the incidence and the severity of muscle injuries in top-level soccer players.

Practical Application. The presence of the MCT1 T allele could be taken into account to develop individualized training programs for soccer players to maximize their strength potential and to overcome barriers resulting from intense exercise.

DEMOGRAPHICAL EVOLUTION AND MITOCHONDRIAL LINEAGE EXTINCTION

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Keywords: *Human Evolution, Branching, Fertility, Offspring*

In this note we evaluate the probability of extinction (EP) of the female offspring of two women: the one of the Paleolithic, the other of Italy today. In both cases it is assumed that possible extinction arises exclusively for the degree of fertility and / or for casual sex-ratio imbalance. EP is obtained as the probability that the Branching Process describing the evolution of the offspring by a progenitor degenerates in a "Blank Generation", i.e. in our case. a generation without women. EP is the solution between 0 and 1 of a linear equation whose coefficients are the probabilities that progenitor has 0, 1, 2, ... daughters. We evaluated such probabilities by consulting literature. Of course, EP is also the probability of extinction of progenitor's mitochondrial lineage.

**FEEDING THE CITY: ISOTOPE VARIATION IN IMPERIAL PERIOD COMMUNITIES IN ROME
(1ST-3RD CENTURIES AD)**

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Keywords: *Stable Isotope Analysis, Feeding, Rome, Imperial Age*

In Imperial Age (1st–3rd centuries AD) the population of Rome was composed mostly of lower class people, whose dietary habits are only partially recorded in the historical sources. According to these records, the overall Roman diet included primarily foods that could resemble a classic Mediterranean diet, featured by a wide variety of vegetables. The meat was an uncommon luxury and often its source was the hunting or the poultry and swine breeding. However, poor Romans may have ate also whatever they were able to find in the surroundings, leading to significant heterogeneity in the dietary habits. This study complements previous papers by adding new isotope data from several Imperial necropoleis in Rome, allowing to deepen our knowledge on the lower class people eating customs. The determination of possible food sources has been carried out through the analysis of coeval faunal remains. The global results confirm the historical assumptions with an overall omnivorous feeding with good intake of carbohydrates, mainly provided by a cereal-based diet. The protein sources seem to be represented by faunal remains of terrestrial origin, although a reasonable level of differentiation can be highlighted in necropoleis close to watercourses. In fact cemeteries next to freshwater environments seem to be featured by at least a moderate degree of exploitation of these ecosystems, supporting hypotheses related to a not complete dependence of the communities from the foodstuffs distribution system.

EXPLORING MICROBIOTA BIODIVERSITY THROUGH MASSIVE PARALLEL SEQUENCING WITH THE ION TORRENT PGM PLATFORM

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Keywords: *Microbiota, Human Evolution, Massive Parallel Sequencing, Microbiome and Human Genome Co-Evolution*

The totality of microbial communities that share the human gastro-intestinal tract as ecological niche is called “microbiota” and, recently, several studies had highlighted the close relationship between its composition and various human conditions. Nevertheless, the evolutionary history of this interaction remains still unexplored. Massive parallel sequencing of the human intestinal microbiome provides a new approach to explore the correlation between changes in microbiota composition and the host physiological status.

Recently, a new kit for metagenomic analysis has been developed for the Ion PGM platform. The “*Ion Torrent Metagenomics 16S kit*” allows analyzing most part of the various hypervariable regions which characterize this gene and which are commonly used for bacterial identification. Furthermore, the “*Ion 16S Metagenomics Analysis Module*” within the Ion Report software provides a specific support for analysis of 16S results. We tested the efficiency of this kit on 20 human samples belonging to two groups exposed to different exogenous compounds.

Preliminary results showed an evident difference in the microbial composition between the two groups and a different performance efficiency of the investigated hypervariable regions. These findings also suggest that some regions are particularly indicated in the analysis of gastro-intestinal microorganisms biodiversity than others.

This metagenomic approach is still rarely applied in anthropological studies, although recent researches showed that some key passages of our evolutionary history, as the divergence from African apes or the Neolithic transition, have deeply influenced our microbiota composition and biodiversity. Therefore, investigating the microbiota composition in relation with human genetics promises to shed new light on the underlying complex co-evolutionary processes.

SIBSHIP SIZE AND HEIGHT BETWEEN 19TH-20TH CENTURY IN SUSA VALLEY (PIEDMONT, ITALY)

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Keyword: *Height, Birth Order, Alpine Population*

Many studies have highlighted an increase of height in Italy in the last decades of the 19th century. This increase is considered a sensitive indicator of the quality of life, connected to improvements of health conditions and nutritional status. The purpose of this work is to check the influence of the family sizes on the stature of conscripts born in the second half of the XIXth century in Susa Valley.

The different measurements were taken from the registers of medical inspection for conscription of classes 1861-1891.

The database consists of 1352 individuals originating from three municipalities of Susa Valley. In accord with the secular trend, the average height of conscripts increases by a few centimeters in 25 years. Using the automatic family reconstruction we analyzed families with two or more siblings and spotted the differences of stature according to the birth order. Mean stature decreases as sibship size increases, given that resources are shared among more people. The height loss according to the birth order has not been proved by our data. We have only noticed a slight height loss in the sibships with two individuals. Conversely in the largest families the conscripts of n+1 order tended to be taller than their brothers of n order. It seems that the progressive increase of sibship size has favoured the ability of finding additional resources for the family. The mean height is slightly shorter in large families, but the last-born children are taller than the first-born ones, probably for the positive effects connected to the epidemiological transition.

**CULTURAL TRANSMISSION AND EVOLUTION:
SEX-INFLUENCED TRANSMISSION**

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Keywords: *Proper Names, Cultural Transmission, Civitella Del Tronto, Giaglione, Family Reconstruction*

For over thirty years the use of matrixes of surnames has been an established method to study the changes of genetical structures in modern populations. Surnames are transmitted vertically from parents to children. Changes in a vertical transmission are rather slow. Instead, *Homo sapiens'* evolution took place very quickly by the cultural point of view. In order to survey the cultural identity of a community - through the study of personal names - you can use similar techniques to those used for surnames. Names are transmitted culturally on multi-tiered and they can change rapidly even into the same generation. The technical term "meme" expresses affinity with the gene, even though the patterns of biological and cultural transmission don't have bijection. In this paper we have considered the names of children born in Civitella del Tronto (TE, 1880-1945) and the names of the inhabitants of Giaglione (TO) at several censuses (from 1689 to 1861). The assumption is: if the name's frequencies remain constant there is no evolution and the probability of naming is mainly a function of frequency allocation in the previous period. A progressive substitution of all the commonest names at the beginning of the 19th century can be observed in Civitella del Tronto. During the 20th century new names come out and the changes are faster. Female names are characterized by a greater variability and are less tied to tradition. Naming is divided into three well definite periods: 1) Borbonic (1810-56), 2) transition (1857-1895), 3) the 20th century (1896-1945).

**SEQUENZIAMENTO COMPLETO DEL GENE *TTR* E CORRELAZIONE GENOTIPO-FENOTIPO
IN PAZIENTI AFFETTI DA AMILOIDOSI DA TRANSTIRETINA**

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Keywords: *Patologia Rara, Varianti Non Codificanti, Sequenziamento, Predizione Funzionale, Annotazione*

L'Amiloidosi da Transtiretina (ATTR), patologia a trasmissione autosomica dominante, è la forma più comune di amiloidosi sistemica, caratterizzata da un fenotipico clinico complesso, con compromissione progressiva del sistema nervoso, seguita da interessamento cardiaco, genito-urinario e gastroenterico. Nel gene *TTR*, localizzato sul cromosoma 18 e codificante per la Transtiretina, sono state identificate 113 mutazioni amiloidogeniche: tra queste la Val30Met mostra una forte eterogeneità relativa a età di insorgenza e penetranza. Per spiegare l'elevata variabilità fenotipica tra i portatori della mutazione, sono state proposte diverse ipotesi: una di queste si basa sul possibile ruolo svolto dalle regioni non codificanti del gene *TTR*. E' ormai noto che varianti contenute in questi tratti del genoma possano modificare l'espressione genica, il cui effetto potrebbe essere a carico della manifestazione del fenotipo clinico. L'obiettivo di questo studio è l'analisi della sequenza dell'intero gene *TTR* in 40 individui affetti da ATTR, al fine di identificare varianti e/o aplotipi correlabili alla differente manifestazione clinica nei pazienti analizzati.

L'analisi, tuttora in corso, ha permesso di identificare molteplici regioni polimorfiche, alcune caratterizzate da varianti non annotate nei database di riferimento. Il presente studio potrebbe, quindi, supportare l'ipotesi riguardante il ruolo di varianti cis-regolatorie nell'eterogenea manifestazione dell'ATTR. L'approccio scelto potrebbe, infatti, coadiuvare i test genetici attualmente in uso per prevedere il fenotipo clinico in portatori di particolari mutazioni amiloidogeniche.

GROTTA DELLO SCOGLIETTO (ALBERESE, GROSSETO): REVISION OF THE HUMAN SKELETAL REMAINS-EXCAVATION OF CARDINI AND RITTATORE VONWILLER (1948- 1952)

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Keywords: *Burials, Early Bronze Age, Anthropological Issue, Pathology, Cranial Trepanations*

The site of Grotta dello Scoglietto (Grosseto) has been investigated in 1948, 1950 and 1952. Due to the presence of a large amount of burials and of a substantial number of remains with evidence of surgical interventions (for instance cranial trepanations) , the site is considered an exceptional area as far as the Early Bronze Age of Central Italy is concerned.

Half a century since the first study of Grotta dello Scoglietto skeletal remains by Raffaello Parenti (1962), a review of the human skeletal remains has been deemed necessary. This work aims at investigating the population that was buried and, despite the low amount of archaeological excavation data, at retracing its funerary practises and customs, including the treatment of corps. The purpose of this research is, from one side, to contextualize the site in the Tuscan environment, by outlining its chrono-cultural framework. On the other side, an update of the previous studies has been carried out, through a comprehensive anthropological analysis and review, by defining the sample's minimal number of individuals (MNI) gender and pathology.

In conclusion, a broad interpretative framework is suggested, taking into account several studies relating to the various hypothesis that have been put forward over the past few years of research. The purpose of this work is not just limited to an anthropological review, but it also aims at encouraging new and more synergic research on archaeological, taphonomic and anthropological issues.

**L'ESPOSIZIONE DELLE MUMMIE AL MUSEO UNIVERSITARIO DI CHIETI:
UNA SCELTA CONSAPEVOLE**

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Keywords: *Museografia, Mummie, Resti Umani, Etica*

La sezione "Mummie: un archivio biologico" del Museo dell'Università "G. d'Annunzio" di Chieti-Pescara fu inizialmente realizzata come esposizione temporanea nel marzo 2006, in collaborazione con la Soprintendenza Regionale dei Beni Culturali, per poi diventare permanente con un nuovo allestimento nel 2011.

Vi sono esposte quattro mummie umane provenienti dal Forte Spagnolo dell'Aquila, una mummia infantile rinvenuta a Celano (AQ) e quattro mummie recuperate a Casentino (AQ) che rappresentano un archivio biologico preziosissimo.

La museologia internazionale si sta interrogando sulle questioni etiche legate alla gestione ed esposizione dei resti umani, valutandone anche la legittimità.

Alla luce di questo dibattito la scelta di esporre le mummie nel percorso museale è stata consapevole e si basa sulla consolidata esperienza della Sezione di Antropologia nel settore specifico, sulla rilevanza scientifica delle ricerche condotte su di esse ed anche sulla valutazione dell'interesse che le mummie suscitano nel grande pubblico, stimolandolo ad approfondire la conoscenza dei nostri antenati e della loro cultura.

L'allestimento, che si è dovuto confrontare anche con la presenza di mummie di infanti, è stato progettato attenendosi alle indicazioni del Codice Etico dell'ICOM sui "Materiali culturalmente sensibili" (art. 4.3) al fine di trovare un punto di compatibilità pratica fra il dovere della divulgazione scientifica, corretta e completa, e l'obbligo di rispetto verso i resti umani antichi.

Sono, perciò, stati adottati particolari accorgimenti espositivi e supporti didattici per mostrare senza spettacolarizzare le mummie al fine di garantire una visita consapevole e rispettosa da parte del pubblico.

**AT THE EAST OF THE ANDES:
GENETIC PROFILE OF AMAZONIAN PEOPLE FROM PERU'**

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Keywords: *mtDNA, Y chromosome, STR, South America, Peru*

The Asiatic origin of Native Americans is today widely accepted, but the migration route of the first humans into the continent is not completely understood. Our study focuses on native Peruvians: the Amazon rainforest covers about 60% of the territory of Peru, but only a small number of indigenous populations from this area have been studied. Some archaeological remains were used to hypotize an Amazonian origin of the first human cultures settled in the Andes, others claim a Mesoamerican source population or an Ecuadorian one. We report mitochondrial DNA (mtDNA) hypervariable segment sequences, 15 Y-STRs and 8 Y-SNPs of 160 samples collected in the environs of Pucallpa and Iquitos in the middle of rainforest, which belong to four different populations. We compare our data with others from sorrounding South American regions to establish which is the best model to explain the peopling of the area and to clarify if genetic exchanges with Andean region have somewhen occurred. Our results show similar levels of genetic variability for mtDNA and Y chromosome in our Peruvian samples, but different female and male-mediated gene flow and different relationships between Amazonian and Andean people depending on geography and ecology, beside cultural traits and historical events.

CON IL CALIBRO TRA LA CENERE. NUOVI STANDARD METRICI PER LA DETERMINAZIONE DEL SESSO DI RESTI UMANI INCINERATI

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Keywords: *Incinerazioni, Determinazione del Sesso, Morfometria*

La determinazione delle caratteristiche biologiche fondamentali di ciascun individuo rappresenta una fase propedeutica e irrinunciabile nell'analisi antropologica dei resti scheletrici umani. Conoscere il sesso e l'età alla morte, infatti, permette non solo di "ricostruire" il singolo ma anche di interpretare il suo ruolo all'interno di processi bio-culturali della comunità d'appartenenza. L'estrazione di questi parametri a partire da ossa e denti, non è certamente compito banale e ben si conoscono (anche se raramente si tengono in considerazione) i limiti teorici e pratici di questo tipo di analisi.

Nel caso specifico di resti provenienti da contesti ad incinerazione, la praticabilità e l'affidabilità delle stime del sesso sono ulteriormente complicate da una serie di fattori. L'elevato grado di frammentarietà e le modifiche morfologiche subite dai resti scheletrici, rendono più difficoltoso il riconoscimento dei caratteri che sono comunemente utilizzati per la determinazione del sesso su base morfologica, inoltre, la riduzione dimensionale dei frammenti limita l'applicabilità degli standard metrici desunti da serie di inumati.

Il presente studio intende, attraverso l'analisi di contesti ad incinerazione con sepolture dotate di corredo specifico del genere, proporre nuovi standard metrici, che possano offrire una buona affidabilità, anche a livello interpopolazioneistico.

Su un campione di oltre 100 individui proveniente da diverse necropoli italiane, sono state rilevate 26 variabili metriche, riferibili alle porzioni scheletriche che più frequentemente si conservano, caratterizzate da punti di repere facilmente individuabili anche nel caso di cremazione.

I risultati hanno permesso di individuare le variabili in grado di discriminare tra i due sessi e applicabili indistintamente alle serie esaminate.

THE EARLY BRONZE AGE NECROPOLIS OF SORBARA DI ASOLA (MN)

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Keywords: *EBA, Italy, Necropolis, Inhumated Remains*

In this study the results of the anthropological analysis of inhumated remains from the necropolis of Sorbara di Asola (Mantua) are presented. The excavation took place between July 1999 and March 2000 and has unearthed six different burial areas, one of which contained archaeological objects dated to the Early Bronze Age. In total were identified 20 single graves belonging to this period. Within the burials, the bodies were positioned in a squatting position with upper and lower limbs toward the chest, the hands were positioned at the face. Some individuals were deposited on the right side with the head pointed to north, other were on the left with the head to south. The face of all subjects look toward the W. This mode of deposition is well documented in EBA flat inhumation necropolis north of the Alps (as Singen, Germany and Franzhausen, Austria) and in other sites of this period in the Po Valley (Arano and Valserà, VR), where the bipolar deposition ritual is defined sexually.

In the sample were identified 11 adults and 7 subadults. For each subject were collected the following biological data: sex, age at death, stature, body mass, skeletal markers of lifestyle and health status (dental-alveolar features and paleopathological conditions of post-cranial remains). The anthropological analyses were partially affected by the poor state of conservation of the skeletal remains and a long restoration process was required. All the results were compared with archaeological information and with data from other necropolis of the same area and period.

AN UNUSUAL DENTAL ENAMEL ALTERATION IN PREHISTORIC ITALIAN POPULATIONS*Dori I.¹, Moggi Cecchi J.¹*¹Dipartimento di Biologia, Laboratorio di Antropologia, Università degli Studi di Firenze**Keywords:** *Lingual Groove, Upper Anterior Dentition*

An unusual modification of the dental enamel surface was observed and described, for the first time, in an Early Bronze Age population from northern Italy (Arano, VR) (Dori & Moggi Cecchi, *AJPA*, 154, 609-614, 2014). The alteration is similar to a curvilinear groove located on the lingual surfaces of incisors and canines in the upper jaw. This lesion is situated a few mm from the cervix and extends from the mesiolingual to the distolingual surface. After recording this feature in the Arano population, its occurrence in other prehistoric samples has been investigated. This enamel defect is alike, in appearance, to those observed in other prehistoric population from Italy, as Sorbara di Asola -MN (EBA), Grotta del Fontino -GR (CA/BA), Ponte S. Pietro -VT (CA), Garavicchio -GR (CA) and from Europe, as Franzhausen I -Lower Austria (EBA), until now undocumented. The dentition of all the individuals of these skeletal samples was analyzed to determine the frequency and the etiology of this lingual modification. The observations included groove morphology, position and association with dental pathology. Some teeth were also analyzed under a scanning electron microscope to better understand the nature of this alteration. Because of its morphology, the groove cannot be considered as a result of disruptions in the process of enamel deposition, but probably the result of some kind of chemical erosion occurred in vitam. The cause of this unusual alteration remains unknown.

**INTERSTITIAL TELOMERIC SEQUENCES DISTRIBUTION IN EIGHT NEOTROPICAL PRIMATES
(PLATYRRHINAE) BY (TTAGGG)_n PROBE MAPPING**

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Keywords: *Chromosomes, Genome, Evolution*

Platyrrhini radiation is characterized by a high intra and intergeneric genome variability. This genome variability due to intra and inter-chromosomal rearrangements occurred during evolution could be possibly link to the involvement of telomeric and heterochromatin sequences. Telomeres, the terminal regions of chromosomes, constituted of particular repeated DNA sequences (TTAGGG)_n and proteins, are called true telomeres and have their rule in determining the replication and the stability of chromosomes. The DNA component of telomeres can be also found at intra-chromosomes sites such as close the centromeres and between centromere and telomeres, and are known as Interstitial Telomeric Sequences (ITSs). Traditionally considered just "junk DNA", ITSs have been on the contrary associated with chromosomal rearrangements even if their rule have not elucidated. Chromosomal localization of ITS sequences where analyzed mapping telomeric (TTAGGG)_n sequence (PNA probe) by FISH on: *Callithrix argentata*, *Callithrix jacchus*, *Cebuella pygmaea*, *Saguinus oedipus*, *Lagothrix lagotricha*, *Saimiri sciureus*, *Aotus nigriceps*, *Aotus trivirgatus*. Telomeric sequences are localized not only at the terminal ends of all chromosomes but our results indicate that two types of ITS, centromeric and interstitial, are present in *Lagothrix* and *Aotus*. We discuss their possible role in chromosomal evolution and potential application as phylogenetic marks. More molecular cytogenetics studies will permit a better understanding of the mechanism of ITSs origin and contribution to chromosomal evolution in Neotropical primates.

**RADIOLOGICAL TOOTH/PULP RATIO IN CANINES AND INDIVIDUAL AGE ESTIMATION
IN A SAMPLE OF ADULT NEOLITHIC SKELETONS FROM ITALY**

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Keywords: *Palaeodemography, Neolithic, Dental Age, Pulp/tooth Area, Cameriere's Method*

The estimation of an individual's age at the time of death is one of the most important component in anthropological studies and is the basis for demographic studies on ancients. However, the different methods commonly used in anthropology for adult age estimation at death provide results with a high level of uncertainty. The consequence is the inability to develop demographic studies with a good degree of reliability. A non-destructive method currently available is the analysis of the apposition of secondary dentine on which Cameriere's method is based.

The purpose of this work is age estimation at the death using Cameriere's method on a sample of 18 adult Neolithic skeletons from four sites in Southern Italy (Apulia): Carpignano, Masseria della Marina, Samari and Serra Cicora. The estimates derived from the study of mandibular and maxillary canines were compared with the age ranges obtained with commonly used anthropological indicators: fusion of cranial sutures, degree of tooth wear, remodelling of the pubic symphysis and the auricular surface of the ilium. The latter two provide intervals that encompass the ages estimated with Cameriere's method.

The results show that the population was composed of individuals of advanced age, even beyond the age of 50, hardly distinguishable by other methods.

This finding may support the hypothesis that individuals aged 50+ are rare in prehistoric skeletal samples due to the unreliability of classical anthropological methods, not only because they were actually rare in prehistoric populations, or absent for taphonomical reasons.

**THE NECROPOLIS OF CASTELLO DEL TARTARO (VENETO, ITALY):
A BIOARCHAEOLOGICAL PERSPECTIVE ON BRONZE AGE SETTLEMENTS**

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Keywords: *Bronze Age, Bioarchaeology, Necropolis, Human Skeletal Remains, Italy*

Castello del Tartaro (Cerea, VR) is a wide banked and moated village of the Middle and Late Bronze Ages located in the area of the southern of the Grandi Valli Veronesi. In 1989 a biritual necropolis, located about 100 meters northwest of the village, was found. Since 2004 archaeological excavations are revealing one of the bigger protohistorical cemetery in North Italy. The aim of this study is to carry out a preliminary bioarchaeological analysis on a sample of 25 individuals. After the evaluation of conservation conditions, the biological profile (sex, age at death, postcranial indexes), health conditions and occupational activities were assessed. The sex composition is quite balanced, with a small female predominance. As regards the age, the most represented class is that of young adults (32%) followed by adolescents (25%) middle adults (24%) and children (12%), only one individual belongs to the group of old adults (4%). Results of postcranial indexes and the analysis of skeletal markers of occupational stress showed a prevalent condition of platymeria and euricnemia in both sexes and a greater robusticity of upper limbs compared to the lower ones. With regard to dental health, the 60% of individuals revealed caries and para-masticatory wear in addition to a high frequency of dental enamel hypoplasia (84%). Further analysis is needed in order to better understand the paleodemography of this community who lived in a central place of a broad system stretching from the Baltic to the eastern Mediterranean, as archaeological finds of amber and Aegean pottery testify.

BODY STRUCTURE AND PHYSICAL ACTIVITY SURVEY OF HIGH SCHOOL STUDENTS AND WATER POLO PLAYERS

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Keywords: *Body Structure, Physical Activity, High School Students, Water Polo Players*

According to WHO, physical inactivity should be considered a worldwide public health problem. Unhealthy diet and physical inactivity are key risk factors for obesity, cardiovascular diseases, cancer and diabetes. The Mediterranean regions are indicated among the areas in which insufficient physical activity is prevalent.

The present study reports nutritional state in relation to the level of physical activity of 300 students aged 14-20, attending a technical high school in Bari (Italy). To highlight the effects of sports and physical activities, a group of 78 water polo players of the same age were compared. Standard anthropometric variables and impedentiometric, nutritional and behavioral data were collected, and particular attention focused on the time devoted to sports and physical activities.

Anthropometric values such as height and weight were higher than the average reference values in both groups. Athletes have greater biacromial width and greater thorax, calf and thigh circumferences, as expected in relation to the movements and muscles involved in athletics.

As regards BMI distribution, several athletes were classified as overweight or obese, in contrast with the fat mass percentage resulting from impedentiometry, since body build and frame size can affect the BMI-percentage ratio of body fat.

In general, according to principal component analysis, the water polo players tended to be assigned to a particular "morphotype", although they share a number of functional and structural aspects with many high school students who, in any case, report a satisfactory level of sports practice.

**PALMAR DERMATOGLYPHICS OF CORSICANS AND COMPARISON
WITH THOSE OF SARDINIANS**

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Keywords: *Palmar Dermatoglyphics, Sardinians, Corsicans*

Digital and palmar dermatoglyphic patterns are non-adaptive traits free from environmental influences (Reddy and Reddy, 2006), for this reason they represent a good tool for population analyses.

In this note we report on a comparison of qualitative and quantitative aspects of palmar dermatoglyphic patterns between Corsicans and Sardinians.

The palm prints of 107 Corsicans (54 males and 53 females) recorded by ink method were compared with the prints of Sardinians. The dermatoglyphic traits used for the comparison were: the presence of true patterns and vestiges in the five palmar areas, modal types of C line termination according to the Plato classification (Plato, 1970), a-b ridge count, A-d ridge count, main line index.

There are no significant differences in the qualitative traits between Sardinians and Corsicans in both sexes. Moreover, with a value of 0.73 for the radial modal type/ulnar modal type ratio, the Corsicans join other populations, such as the Sardinians (0.88), Italians (0.94), Spaniards (0.95), Moroccans (0.77) and Tunisians (0.81) (Floris, 2014). For the quantitative traits, there are significant differences for the a-b ridge count in both sexes and for the A-d ridge count in males alone (higher values in Sardinian males), but not for the main line index.

In conclusion, this study shows that Corsican and Sardinian populations are similar but not identical, with several significant differences. These similarities and differences can be explained mainly by genetic drift with subsequent isolation and endogamy (Sanna et al., 2004).

TRA I GRECI, TRA GLI INDIGENI: ANALISI PRELIMINARE INTEGRATA DEL RECORD ODONTOSCHELETRICO UMANO DALLA NECROPOLI DI *PITHEKOUSSAI II*, ISOLA DI ISCHIA (NA)

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Keywords: *Pithekoussai, Isotopi Dello Stronzio, Migrazione*

Nella riflessione sul fenomeno della colonizzazione greca in Occidente, l'area funeraria di *Pithekoussai* (VIII sec. a.C.-I sec. d.C.) viene a configurarsi come *unicum* nel record archeologico del Mediterraneo occidentale. Officina di relazioni transmarine tra genti autoctone, greche e di origine fenicio-siriana, Ischia è un osservatorio privilegiato per lo studio delle dinamiche di mobilità delle antiche comunità umane.

Nel 2012 è pertanto istituito dalla Soprintendenza BA di Napoli un gruppo di ricerca per l'analisi del record di *Pithekoussai II*, composto da T. Cinquantaquattro, B. d'Agostino, C. Gialanella, P.G. Guzzo, N. Manzi, C. Pellegrino.

Oltre che per il record archeologico riferibile ai corredi, l'eterogeneità del contesto funerario è documentata dalla coesistenza e dalla variabilità del rituale della cremazione e dell'inumazione.

Lo studio di questa realtà, probabilmente multietnica, ha richiesto, oltre che un'analisi antropologica di base, l'utilizzo di tecniche di indagine specifiche.

Lo stato di conservazione del campione odontoscheletrico pithekoussano ha permesso di sottoporre i reperti di alcune selezionate sepolture a incinerazione e inumazione all'analisi dello smalto dentale e della porzione coclea (*Harving et alii*, 2014) per la determinazione del segnale degli isotopi dello Stronzio (⁸⁷Sr), indicatore di eventuale origine alloctona dell'individuo.

Il presente contributo illustra le principali linee di metodo impiegate per lo studio dei resti odontoscheletrici umani del record archeologico *Pithekoussai II*, ove alla complessità del processo di decodificazione dei dati arqueo-antropologici si associa la possibilità di proporre scenari realistici delle dinamiche di interfaccia e commistione tra la componente indigena e allogena fornendo all'indagine archeologica una visione di più ampio respiro.

DISENTANGLING DEMOGRAPHIC HISTORY AND THE GENETIC BASES OF HIGH-ALTITUDE ADAPTATION OF AN ISOLATED HIMALAYAN POPULATION

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Keywords: *High-Altitude Adaptation, Natural Selection, Admixture, Himalayan Populations*

The geographical region occupied by present-day Nepal played a central role in shaping ancient human dispersal through the Asian continent, acting as a crossroads between India and East Asia. For this reason, modern Nepalese people represent an intricate mosaic of culturally and genetically distinct human groups. In addition to this highly diverse substrate, northern populations of the Himalayan valleys had undergone an even more complex history of isolation and adaptation to extreme high altitudes.

Here, we present preliminary results from a study conducted on one of these remote communities residing in the Rolwaling Valley. Overall genetic variability of this population was first explored through the characterization of uniparentally-inherited markers to detect major population structure and to evaluate the extent of the experienced genetic drift or sex-biased migrations, also by comparison with several populations from Southern and Eastern Asia.

The examined population sample was then extended by inclusion of additional ethnic groups residing in the valley and a genome-wide survey on more than 700,000 autosomal variants was launched to investigate also their genetic adaptation to high-altitude.

Contrary to what expected in the case of long-term isolation, people from Rolwaling overall exhibit high genetic diversity plausibly due to internal substructure derived by the admixture of different ancestral components and/or recent migrations, as confirmed by the detected sex-biased admixture patterns.

Results for genome-wide analyses are expected to help to disentangle the complex genetic history of these groups, also providing information essential to improve the understanding of the genetic bases of high-altitude adaptation of Himalayan populations.

**A MULTIDISCIPLINARY APPROACH TO INVESTIGATE THE MEDIEVAL POPULATION
OF SANTA SEVERA (ROME, ITALY)**

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Keywords: *Medieval Populations, Paleobiology, Sex Determination, Postcranial Measurements, Stable Isotopes*

The aim of the present study is to obtain palaeobiological data regarding the Medieval cemetery of Santa Severa Castle (Rome, Lazio), located close to the sea and dated back to the 9-14th centuries.

The minimum number of individuals amounts to 455: 62% adults and 38% subadults. Sex determination was conducted for adult individuals: 30% has been females, 43% males, 27% indeterminates due to their poor state of preservation and 2% indefinites because of their intermediate degree of "sexualisation". The study of postcranial measurements has allowed us to perform the reconstruction of physical structure: it has been possible to estimate the living stature and the most important anthropometric indexes, e.g. indexes of robusticity. Skeletal and dental diseases and the study of the musculoskeletal markers have been also carried out to draw conclusions about the state of health and the type and level of activities and possible differences within the individuals of the population.

Molecular analysis of carbon and nitrogen stable isotopes has been performed on 120 human individuals, 35 faunal remains and 9 charred seeds, in order to define dietary patterns and to evaluate the consumption of aquatic resources, considering that the population lived near the sea. Moreover, between the early and the late Medieval period, socioeconomic change occurred in Europe and an important factor that probably influenced a general increase in fish consumption was the catholic observance of abstinence from meat for at least four months of the year, banned every Friday and in the period of Lent.

FIRST GENETIC STUDY OF VILLANOVIAN: PRELIMINARY OUTCOMES FROM THE SKELETAL REMAINS OF TRILOGIA NAVILE NECROPOLIS (BO), VII C. B.C.

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Keywords: *Population Genetics, aDNA, mtDNA, Villanovian Culture, Trilogia Navile*

This work represents the first attempt to study genetically Villanovians, a population lived in Italy during Iron Age (IX-VII c. B.C.). Usual of this culture was incineration, but the exceptional retrieval of inhumations from the archaeological excavation of Trilogia Navile (BO), allowed to carry out the analysis of DNA from seven skeletal samples. Villanovians origin and ethnicity are debated since the past century and remains unclear whether they are an indigenous Italian group or migrants from abroad. For this reason, we started to study them from a genetic point of view trying to discover the deep meaning of their “culture”, to enlighten the possible genetic connections they had with Etruscans, and to look for information about their origin. The second aim of the research exploited genetics to check kinship in two individuals that presented an epigenetic feature, hyperdonthia. The genetic study was preceded by Fourier transform infrared spectroscopy (FTIR) pre-extraction analysis in order to investigate the mineralogical conservation of bones and to choose the best samples. The analysis of DNA followed the most recent literature concerning sampling, indeed, we selected samples from the hardest region of the human body, the petrous portion of temporal bone. The population genetics study focused on the HVRI of mitochondrial DNA on a subset of samples from Trilogia Navile. The outcomes presented are very interesting and have to be considered as pilot starting point of a wider analysis that will involve all the skeletal material available from the necropolis and the sequencing with NGS technologies.

ORIGIN OF THE AMYLOIDOGENIC *TTRVAL30MET MUTATION IN THE ITALIAN POPULATION**

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Keywords: *Founder Mutation, Phenotypic Heterogeneity, Rare Disease, Short Tandem Repeat*

Transthyretin related amyloidosis (ATTR) is a rare pathological condition featured by autosomal transmission of amyloidogenic mutated *TTR* gene. The structural alterations induced by mutation make the protein prone to form amyloid fibrils in tissues. More than 100 different mutations in *TTR* gene have been published. ATTR has been worldwide scored, with strong phenotypic heterogeneity in Europe, Japan and South America and several studies highlighted multiple founders mutation for the different Val30Met foci. Few Italian areas record several ATTR patients, and the Frosinone area in Latium is one of these. .

The aim of this research was to evaluate the origin of Val30Met mutation in Italians to understand the relationship with other European Val30Met alterations.

Microsatellite analysis was performed for 11 markers in *TTR* gene flanking regions both in 29 Val30Met patients and 34 unrelated controls for estimating the age of the Most Recent Common Ancestor (MRCA).

Our genetic analysis showed an estimated age of origin of 34–36 generations ago for the Italian Val30Met. The comparison of Italian Val30Met haplotypes with those from Sweden and Portugal highlights relevant differences that seem to be consistent with an independent origin of Italian Val30Met mutation. This genetic evidence agrees with the heterogeneous disease phenotypes in these populations.

In conclusion, the outcomes of this study could aid in improving the knowledge about the origin of Val30Met mutation in Italy, through the linkage between demographic history of Italians and the distribution of ATTR disease.

THE NUTRITIONAL DUAL BURDEN HOUSEHOLD IN THREE SUB-SAHARIAN AFRICAN COUNTRIES

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Keywords: *Malnutrition, Nutrition Transition, Wealth Status, DHS*

Background: Nutrition transition and the “dual burden” of malnutrition, with under- and overnutrition occurring simultaneously within countries or households (DBH), is an emerging phenomenon in sub-Saharan Africa (SSA). In this study we analysed the factors associated with DBH in three SSA countries: Swaziland, São Tomé and Príncipe and Lesotho.

Methods: Data were retrieved from the Demographic and Health Surveys (DHS) datasets (www.dhsprogram.com). Twenty-eight demographic, nutritional, and socio-economic variables were analysed in three groups of mother-child pairs: dual burden (overweight mothers and stunted children), overweight mothers and children, underweight mothers and children. Random Forest regression and a subsequent logistic regression analyses were applied to identify the most predictive variables in classifying DB pairs and to assess their role in group differentiation.

Results: Swaziland showed the higher percentage of DB pairs (10.2%) compared to the other countries (about 5%). The correct classification of the DB group (error: 7%) was mainly due to the effect of 15 variables, especially: wealth status, mothers’ education, mothers’ age, duration of breastfeeding, birth size, mothers’ anemia level. An increasing trend from the underweight, to the dual burden, to the overweight mother-child pairs was observed, with the exception of anemia level that showed an opposite gradient.

Conclusions: Nutrition transition is associated with socio-cultural and lifestyle variations in DB and especially in overweight mother-child pairs. These results suggest that DB could represent an intermediate step toward the increase of obesity prevalence associated with westernization.

NECROPOLI ARCAICA DI MOZIA: DATI ANTROPOLOGICI - CAMPAGNA 2013

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Keywords: *Punici, Mozia, Sicilia, Incinerazione, Necropoli*

La necropoli arcaica di Mozia è uno dei siti di maggior interesse per lo studio dei costumi funerari dei Punici. Malgrado ciò l'analisi antropologica delle oltre 300 sepolture rinvenute è stata in passato trascurata. In questo lavoro vengono esaminate le sepolture del settore orientale della necropoli arcaica (Zona N) ove, nel 2013 si sono aperte due trincee (N15 e N16). L'analisi antropologica ha consentito di stabilire il numero minimo ed l'età degli individui, nonché di valutare le procedure di incinerazione. Tra i dati ottenuti due casi sono caratterizzati dalla composizione mista del contesto funerario: il *locus* 15040 conteneva resti relativi ad un individuo *infans* e ad un adulto, la cista T.219 conteneva materiali relativi a due adulti e un *infans*. Le temperature di combustione sono risultate superiori ai 645 gradi C° in entrambi i casi. Dalla T.212 è stato studiato un *infans*, incinerato in modo parziale, inumato in una certa connessione anatomica, in posizione verticale con il cranio adagiato sul fondo. Alla luce di questi dati è plausibile ipotizzare che questo settore della necropoli non fosse dedicato esclusivamente all'incinerazione di determinate classi di età e che le sepolture, contrariamente a quanto atteso, potevano contenere più individui, di classi di età molto diverse.

NECROPOLI ARCAICA DI MOZIA: DATI ANTROPOLOGICI - CAMPAGNA 2014

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Keywords: *Punici, Mozia, Sicilia, Incinerazione, Necropoli*

La campagna 2014 dell'Università di Palermo ha ampliato lo scavo nella necropoli arcaica (Zona N) ove, oltre alla trincea N15 (aperta nel 2013), è stata aperta una nuova trincea denominata N23. In entrambe le trincee sono stati rinvenuti numerosi reperti scheletrici il cui studio ha gettato nuova luce sui riti funerari praticati nell'isola. Nel corso dell'ultima missione infatti in N15 e N23 sono stati ritrovati i resti di oltre 40 individui appartenenti a diverse classi d'età (fetali, infans, giovani e adulti), inumati in fosse terragne o tombe, in sepolture sia singole che multiple. I pochi casi di incinerazione trovati mostrano ossa combuste ad una temperatura di circa 700°C, solo in un caso (locus 15070), dove sono stati ritrovati i resti di una pira molto estesa, sono state riscontrate ossa diagenizzate da temperature superiori ai 900°C. La maggior parte degli inumati del area quindi non è stata incinerata ma semplicemente seppellita dopo una probabile riduzione. Questi dati confermano che tale settore della necropoli non fosse dedicato esclusivamente all'inumazione di determinate classi d'età (le sepolture potevano contenere classi di età molto diverse) ma anche che le stesse sepolture (site nel terreno o in urne o ciste) oltre a poter contener più individui, avvenivano anche senza il preventivo rito dell'incinerazione. Queste differenze nel rituale possono essere spiegate, oltre che da contingenze puntuali (eventi di morte massiva e improvvisa), anche a diversa provenienza etnica e a diverse culture insistenti sull'isola nel periodo.

**STABLE ISOTOPE AND *IN SITU* TRACE ELEMENT ANALYSES ON HUMAN BONE TISSUE
(ROCCAPELAGO, 16TH-18TH CENT.): PRELIMINARY INFERENCES ON DIACHRONIC CHANGE IN
EATING HABITS AND TRACE ELEMENT RELIABILITY**

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Keywords: *Isotopes, Paleodiet, Trace Elements, Eating Habits*

We measured trace elements and stable isotopes (C and N on collagen) on 19 samples, taken from different anatomical area of 7 individuals from the medieval site of Roccapelago (Modena): our attempt is to reconstruct the diet of these individuals and discuss the role of trace elements in palaeodiet. The good preservation of these bodies represents a unique chance to work on likely diagenesis-free archaeological human remains, to test the trustworthiness of trace element analyses. In fact, in the last decades, trace element reliability was questioned several times. We particularly focus our attention on magnesium, strontium and zinc. Our data set shows different eating habits for the studied individuals. While collagen of the samples dated at 16th century yields typical values of a C3-plant based diet, collagen of samples dated at 18th cent yields higher values of both $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$, probably linked to an higher trophic level and to a shift toward a C4-environment. Similarly, Sr and Mg show the same increment in individuals of 18th cent, while Zn does not show any significant variation. The latter is quite discussed in the scientific literature and has been commonly used as a marker for a protein-rich diet. Our lack of correlation between Zn and stable isotopes (especially N) confirms the uselessness of this element in palaeodiet reconstruction. Geochemical data are also corroborated by the botanical evidence (pollen) of maize presence (C4 plant) and by historical sources that attest the presence of maize in Emilia-Romagna during 18th century.

DENTO-ALVEOLAR INDICATORS IN THE ETRUSCAN-CELTIC POPULATION (4TH-3RD C. B.C.) OF MONTERENZIO VECCHIO (BOLOGNA, ITALY)

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Keywords: *Dento-alveolar Indicators, Monterenzio Vecchio, Etruscan-Celtic, Oral Health, Teeth*

Teeth play an important role in palaeoanthropology, forensic anthropology and bioarchaeology, both because their physico-chemical properties favor their preservation in the archaeological record and because their morphology does not endure functional adaptation during the individual life except physiological and pathological changes. With regard to bioarchaeology, teeth are fundamental to reconstruct oral health status and dietary habits in ancient populations, as pathological and/or physiological dental conditions are strongly influenced by cultural and environmental factors.

In this study we used dento-alveolar indicators to assess the oral health and hygiene status of the individuals buried in the necropolis of Monterenzio Vecchio (4th-3rd c. B.C.).

A total sample of 571 permanent teeth and 483 alveoli from 26 burials was considered in the analysis. The following indicators were evaluated: caries, dental calculus, tooth wear, chipping, enamel hypoplasia, periodontal disease, abscesses and *ante mortem* tooth loss.

Overall, the study revealed that the individuals were characterized by moderate incidence of caries, calculus, wear and high rates of alveolar bone loss. As expected, the severity and frequency of the dental diseases increased with age. Interestingly, the individuals showed high evidence of chipping, possibly indicating paramasticatory activities. The poor oral hygienic condition, along with periodontal disease and consequent *ante mortem* tooth loss, is consistent with an agro-pastoral diet.

These results are very similar to those obtained for other Italian necropolis dated to the Iron Age period, reflecting the historical context and events in which the Etruscan-Celtic community of Monterenzio Vecchio lived.

**ANTHROPOLOGICAL ANALYSIS OF TWO LATE ANTIQUITY GRAVES FROM
IMOLA-OSSERVANZA' MONUMENTAL COMPLEX (BOLOGNA, ITALY)**

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Keywords: *Bio-Archaeology, Late Antiquity, Taphonomy, Non-Metric Traits*

During archaeological excavations in year 2007 at the Osservanza' monumental complex of Imola (Bologna, Italy), two Late Antiquity graves were found. One of these two graves was a single burial (grave 9), the other was a double one (grave 10). The latter showed an interesting taphonomic situation, with the two skeletons partially intersected and one of them having the skull deposited above its tibiae. The recovered skeletons were analysed anthropologically and for paleopathologies at the Laboratory of Archaeo-Anthropology and Forensic Anthropology of University of Ferrara. This study reports the results of the anthropological and paleopathological analyses conducted, with particular attention to the observed non-metric traits and their interesting implications, as well as to taphonomic aspects of deposition.

MORPHOLOGICAL AND MORPHOMETRIC ANALYSIS OF TORRENER BÄRENHÖHLE'S PALEOLITHIC HUMAN TOOTH

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Keywords: *Homo sapiens*, *Neandertals*, *Teeth*, *Enamel Thickness*

In 1924 a prehistoric excavation was carried out in the Torrener Bärenhöhle cave, located near the town of Golling an der Salzach (Salzburg, Austria). Several faunal bones were unearthed, most of them belonging to *Ursus spelaeus*, hence the name of the cave ("Bear Cave"). Some of the bones had presumably been manipulated by humans and identified as scrapers and awls. The first publications of Torrener Bärenhöhle have always mentioned animal bones but in 1971 a human molar attributed for certain to Torrener Bärenhöhle's 1924 collection was mentioned. Initially the tooth was classified as *Homo sapiens*, but subsequently Mr. Urbanek attributed it to *H. neanderthalensis*, giving rise to a debate on the taxonomic classification of the fossil. Here we aim to solve this contention on the taxonomic attribution of Torrener Bärenhöhle's molar using non-invasive digital approach. The tooth was scanned using Micro-CT and the resulting images were segmented to reconstruct a digital copy of the tooth. The three-dimensional digital model was used for non-metric and metrics analysis, the latter based on cusps topography and enamel thickness. The tooth of Torrener Bärenhöhle displays morphological characteristics referable to an upper second molar of *H. sapiens*. The small size of the crown and other morphometric aspects, such as the enamel thickness, support the attribution to *H. sapiens* and not Neandertals. Since the tooth was found among faunal remains dating to early Würm period, which in Europe was generally associated with Neandertals, further studies are needed in order to understand the chronological age of the tooth.

IS THE EVALUATION OF MILLENNIAL CHANGES IN STATURE RELIABLE? A STUDY IN SOUTHERN EUROPE AND ANATOLIA FROM THE NEOLITHIC TO THE MIDDLE AGES

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Keywords: *Stature, Millennial Changes, Europe*

Height variations in populations of southern Europe and Asia Minor from the Neolithic to the Middle Ages were studied to compare the intensity of millennial changes in stature. The regions examined are Sardinia (a Mediterranean island now part of Italy but considered by itself given its unique genetic structure), Italy, Spain, Portugal and Anatolia.

The collection and analysis of the data on millennial changes in these past populations highlighted several problems regarding the comparisons:

- the authors' use of different methods to estimate stature
- the uncertain dating of the skeletal remains
- the absence of mean stature values and/or standard deviations in some time periods
- the small number of samples used to estimate stature
- the single sites of origin of the skeletal material or the small numbers of specimens, not indicative of the entire region.

Nevertheless, it would seem possible to detect two major trends in stature over the millennia: an increase of mean stature from 4000-3200 to 3200-2200 BCE, a decrease during the Roman period from 300-0 BCE to 0-500 CE, and an increase in the Middle Ages (5th-15th century CE).

BODY MASS ESTIMATION FROM SARDINIAN SKELETAL SERIES

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Keywords: *Ancient Populations, Skeletal Remains, Body Mass, Sardinia*

Body mass estimation is an important component of archaeological and anthropological studies. Stature and body mass are used as indicators of health status and of the degree of sexual dimorphism in ancient populations and are useful in the study of the effects of environmental variables such as climate or subsistence strategies.

The aim of this study is to carry out body mass estimation in both sexes in prehistoric, proto-historic and historic skeletal populations of Sardinia (Italy), from the Neolithic to the late Roman and Medieval period, in order to assess variation over time and whether different methodological approaches produce different results.

Body mass estimation was carried out with different regression equations based on femoral head breadth.

The methods showed an essentially similar trend in the assessment of body mass for both sexes. Body mass of female is always lower than males' and shows a positive trend from the Neolithic to the Late Roman-Medieval. Men have a negative trend from the Neolithic to the Punic-Roman period and resume in Late Roman-medieval. Furthermore, the different methodological approaches give different values of body mass.

To achieve a better evaluation of the used methods it is considered appropriate to both increase the number of samples and obtain an assessment of the diet in the different periods considered, and finally compare the data with other contemporary populations of the Western Mediterranean.

**HUMAN ADAPTATION TO OUTER SPACE:
GRAVITY REHABILITATIVE COUNTERMEASURES**

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Keywords: *Human Adaptation, Outer Space, Demineralization Countermeasures*

Humans are the product of a biological and cultural adaptation to our Planet achieved in million years. Terrestrial models may be hardly transferred to extremely long space missions in which peculiar environmental conditions may affect locomotion, working capabilities, living conditions and wellbeing particularly. Absence or modification of gravity influences muscolo-skeletal conditions as demineralization (calcium loss in particular). Astronauts in a long journey could easily encounter osteoporosis and the break of bones without the possibility of re-entry for physical rehabilitation (such is the case of journey to Mars). Starting by the research done since 2006 (Schlacht et al., 2009a, 2009b) by the ZEROgYMN group (Rosato et al., 2012, Tinto et al., 2012) this presentation reports experiment in comparative states (such as: parabolic flight, earth gravity and neutral buoyancy) applying rehabilitation with comfortable, easy to use and non-intrusive equipment based mostly on rehabilitative isometric exercise. Movement capacity are also investigated. Findings will permit to create rehabilitation protocols helpful for astronauts working in zero gravity conditions.

**DIETARY RECONSTRUCTION OF AN EARLY-MIDDLE BRONZE AGE POPULATION FROM
NORTHERN ITALY (BALLABIO, LECCO): A MULTIDISCIPLINARY APPROACH**

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Keywords: *Early-Middle Bronze Age, Northern Italy, Oral Pathology, Diet, Stable Isotopes*

The aim of this study is to define the subsistence strategies and dietary habits of the Early-Middle Bronze Age population of Ballabio (3230 ± 90 BP). This archaeological site, excavated in a rock shelter at 700 m a.s.l., was discovered in 2004 during a geological survey. Skeletal remains were found in two adjacent funerary structures, interpreted as primary burials and as places of secondary deposition. The MNI assessed was 27 subjects: 22 adults (6 females, 3 males, 13 undetermined) and 5 sub-adults. Paleonutritional analyses were conducted by evaluation of dental-alveolar features (caries, abscesses, *ante mortem* tooth loss, dental calculus, tooth wear, chipping, periodontal diseases and linear enamel hypoplasia) and isotopic survey. The dental analysis was carried out on 375 teeth: the individuals exhibited a low prevalence of caries, abscesses and ante mortem tooth loss, high calculus rates and severe wear, suggesting a subsistence pattern based on pastoralism and agriculture. Nitrogen and carbon stable isotope ratios, performed on 25 humans and 4 faunal remains (2 herbivores and 2 omnivores), confirm this trend showing a protein intake based on mixed C₃-plants and animal products from the terrestrial environment. There is no statistical difference according to the sexes and ages, however adolescents and young adults (15-25 years old) seem to have consumed more animal proteins. Furthermore, the isotopic results are similar to Early Bronze Age and different from Middle Bronze Age sites in Northern Italy, suggesting the complexity of agricultural modification in this area firstly impacted by new crop.

A REVIEW OF TECHNIQUES IN FORENSIC ANTHROPOLOGY TO ASSESS SEX IN SUBADULTS

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Keywords: *Sex Assessment, Forensic Anthropology, Modern Humans*

Biological sex is very important to determine when remains are found, since it helps the identification by reducing the pool of potentially matching identities and allows other sex-dependent estimations.

Though techniques for sexing adults are well-established, sexing subadults still remains as a difficult practice, since sexual morphological traits do not emerge until puberty. Because of this, some authors declare that the probability to assess sex on subadults correctly is the same as in a coin flip. The aim of this work is to prove the error of this statement through a review of different studies that used different techniques with high accuracy rates.

The studies of the ilium, cranium, mandible and teeth become an important tool to sex assessment. Each study is not enough to assess sex only by itself, but they all are useful tools to increase the amount of available data and improve the accuracy rates.

Population variability is great and carefulness is very important when these methods are applied.

New molecular techniques centered on the sexual chromosomes have been developed and they have the highest accuracy rates.

**GENETIC ANALYSIS OF NATIVE AND MESTIZOS AMAZONIAN PEOPLES OF PERÙ
THROUGH 16 AUTOSOMAL STR LOCI**

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Keywords: *Autosomal STRs, Perù, Amazonian Natives, Admixed Populations*

Nowadays, the human autosomal STRs are widely used for human identification and resolving forensic cases. However, they can also be used to reconstruct the history of populations as result of genetic admixture between Native peoples and European settlers. Because of their geographic location, the indigenous inhabitants of the Peruvian Amazon region have been considered among the most isolated human groups in the world. Here we report the genetic profiles (16 autosomal STR, analyzed by AmpFLSTR® NGM Select™) of 142 native people from the Amazon region of Perù and of 126 mestizos, collected in the district of Lima. We then compared the STR data of the Peruvian admixed population with STR data both from Amazonian natives and other African, Asian and European populations, in order to increase knowledge on the gene pool of Native peoples and to estimate their contribution in a sample of the Peruvian admixed population. Our preliminary results describe a certain contribution of Native Americans to the Peruvian population and show a low variability among these Amazonian communities, probably due to their geographic isolation and a strong endogamy. In addition, high frequency of some private alleles, typical of the native South Americans, confirms their membership in groups of Native Americans. In conclusion, the genotyping of these indigenous populations and of the relative admixed groups has enabled us to provide a more accurate description of the Peruvian genetic structure, proposing microsatellites usually used for personal identification as a useful tool for the study of human recent migration.

CARATTERISTICHE ANTROPOMETRICHE E SOMATOTIPO IN GIOCATRICI DI PALLAVOLO DI DIFFERENTI CATEGORIE

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Keywords: *Antropometria, Somatotipo, Pallavolo, Femmine*

L'obiettivo dello studio è quello di comparare le caratteristiche antropometriche, la composizione corporea e il somatotipo in giocatrici di pallavolo in relazione alle differenti categorie e ai differenti ruoli. Il campione è composto da 62 giocatrici di differenti categorie (serie B2, C, D) e ruoli (palleggiatore, centrale, attaccante, libero) e 12 giocatrici di beach volley, con età media di $23,58 \pm 7,74$. Le misure antropometriche riguardano peso, statura, circonferenze corporee, diametri articolari e pliche. L'elaborazione dei dati, effettuata mediante il software DS Software, Diagnosi e Terapie Nutrizionali (Dietosystem), ha fornito i seguenti parametri: indice di massa corporea (BMI), percentuale di massa grassa (FM), area muscolare del braccio (AMA), area muscolare della coscia (TMA) e somatotipo. L'elaborazione statistica dei dati è stata effettuata mediante IBM SPSS Statistics v. 22. Statura, AMA e grado di mesomorfismo mostrano differenze statisticamente significative tra le diverse categorie ($p < 0.05$). Le giocatrici di B2 hanno stature superiori a quelle della categoria C (rispettivamente $169,19 \pm 6,68$ cm e $165,40 \pm 6,19$ cm). Tuttavia l'AMA presenta valori superiori nelle giocatrici di C (C: $40,06 \pm 7,27$ cm², B: $34,77 \pm 3,57$ cm²). Parimenti la mesomorfia ha un valore superiore nelle atlete della serie C rispetto alla B2 (rispettivamente $4,84 \pm 2,10$ e $3,40 \pm 1,21$). Statura, FM e livello di meso- ed ectomorfismo presentano valori statisticamente differenti tra i ruoli ($p < 0.05$). I centrali hanno i più alti valori staturali ($172,38 \pm 4,18$ cm) e di ectomorfia ($3,08 \pm 1,02$), i palleggiatori mostrano i valori più elevati di FM ($26,38 \pm 2,99$ %), mentre la mesomorfia prevale nei liberi ($5,46 \pm 2,13$).

GENETIC ANALYSES OF THE FIRST INHABITANT OF SARDINIA

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Keywords: *Ancient DNA, Next Generation Sequencing, Human Evolution, Early Neolithic, Su Carroppu*

The process of neolithisation in Sardinia is difficult to explain due to the scarce and uncertain evidences available for the Mesolithic period. In addition, a gap in the absolute chronology of the two periods indicates discontinuity between Mesolithic and Early Neolithic groups with regard to the different stages of colonization of the island and to the settlement strategies.

Within the Early Neolithic, Su Carroppu rock shelter plays a relevant role in Sardinia. The archaeological excavations, started in 2009 on the lowermost layer (level-4), yielded large quantities of remains, including fragments of human bones intermingled with bones of *Prolagus sardus*. Three direct radiocarbon dates of the human bones placed the remains in the mid-9th millennium cal. BC thus predating Early Neolithic. Consequently, we deal here with the earliest direct evidence of human presence in Sardinia.

With the purpose of better defining the colonization process of the island, we are currently performing depth molecular analyses on the human bones unearthed at the Su Carroppu. In order to evaluate the molecular preservation of the bones, DNA was extracted from nine samples and analyzed through amplification and sequencing of the mitochondrial HVS-I region. Target Enrichment and NGS will be then performed on the most promising sample in order to obtain the entire mitogenome as well as supporting evidence for data authenticity.

UN APPROCCIO MULTIDISCIPLINARE ALLA GESTIONE DEI RESTI UMANI NEI MUSEI

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Keywords: *Museologia, Resti Umani, Etica, Approccio Multidisciplinare*

Fino a poco tempo fa i resti umani nelle collezioni museali erano considerati alla stregua di tutti gli altri oggetti. Solo di recente, negli ultimi dieci anni, il mondo della museologia si sta interrogando sulla presenza di questi particolari materiali.

Spesso assimilati ai reperti naturalistici per tecniche di conservazione, si differenziano tuttavia per la loro peculiare natura di campioni biologici umani e per la valenza simbolica, affettiva, culturale e religiosa che possono assumere.

Sono state soprattutto le richieste di restituzione alle comunità d'origine a porre la questione dei resti umani nei musei spostando l'attenzione della curatela museale dal piano squisitamente scientifico al piano etico e morale e, in alcuni casi, anche giuridico.

Un museo che conserva resti umani è investito di una grande responsabilità poiché ogni fase della loro gestione è passibile di critiche e di rivendicazioni da parte di gruppi o di singoli.

L'importanza dei resti umani per la ricerca antropologica è indiscutibile, ma alla luce delle nuove sensibilità è importante individuare delle linee guida e dei metodi – basati sul principio di rispetto e di dignità umana – che garantiscano un corretto svolgimento delle attività museali di acquisizione, prestito, alienazione, deposito, conservazione, accesso ad uso didattico, ricerca ed esposizione.

La gestione dei resti umani nei musei si presenta oggi come un tema da affrontare con un approccio multidisciplinare che coinvolga non solo la museologia, l'antropologia, la storia del collezionismo, l'archeologia, la storia della medicina, ma anche il diritto, l'etica e le scienze della comunicazione.

**ANTHROPOLOGICAL ANALYSIS OF HUMAN SKELETAL REMAINS:
THE TOMB 16 FROM THE PUNIC NECROPOLIS OF VILLAMAR (VS)**

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Keywords: *Punic Necropolis, Hypogeum Chamber, Biological Profile, NMI*

The archeo-anthropological study introduced in this work was carried out on human skeletal remains from a hypogeum chamber of the Punic necropolis of Villamar, a city located about 50 km from Cagliari, Sardinia, notable for some findings and excavations carried out in the past. The systematic investigations, restarted on 2013, were directed by Piero Bartoloni and Elisa Pompianu thanks to the involvement of the Municipality of Villamar, in collaboration with the University of Sassari. To this day, research has helped to document a Punic funerary installation in use between the 4th-2nd century BC, with different grave typologies: hypogeum chambers, pits (excavated in the ground or in sandstone banks), *enchytrismói*, stone cysts, and “capuchins”. More specifically, the hypogeum chamber denominated “Tomb 16”, investigated in 2013, shows a context of great interest. It consisted of a chamber used repeatedly for approximately two centuries, accommodating at least 26 individuals inhumed, of which 7 adults, 1 adolescent and 18 sub-adult with a clear predominance of subjects aged less than one month of life (34.6%), the latter fact is of great interest compared to the punic funeral traditions. Although much of the evidence had been devastated during the re-use of the chamber, it was possible to identify 4 individuals in anatomical connection, moreover the morphometric analysis allowed the reconstruction of 5 sub-adult subjects in the post-excavation phases. The sample analyzed shows a majority of subjects of plausible European ancestry and only one individual with African-like morphological-features.

**L'AGGREGAZIONE SOCIALE COME RIFLESSO DELLE PRATICHE FUNERARIE DELL'ARABIA DEL II-
I MILLENNIO A.C.: ANALISI TAFONOMICA E ANTROPOLOGICA DELLE GRANDI TOMBE
COLLETTIVE DI DABA (PENISOLA DI MUSANDAM, OMAN)**

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Keywords: *Tafonomia, Oman, Tombe Collettive, Pratiche Funerarie, Fotogrammetria*

L'area sacra di Daba (II-I millennio a.C, penisola del Musandam, Oman) ospita due grandi tombe collettive (LCG1 e LCG2) contenenti i resti di centinaia di individui, almeno 188 la prima e almeno 227 la seconda, in associazione con migliaia di manufatti e numerosi resti di animali. La LCG2, inserita nel panorama dei siti funerari del sud est della penisola Arabica, ha offerto molti spunti per l'interpretazione delle pratiche funerarie alla luce del fenomeno sociale di aggregazione inter tribale. In LCG2 sepolture in giacitura primaria e secondaria si succedono insieme alle fasi di utilizzo e trasformazione della tomba stessa, nell'arco di più di 1000 anni. L'analisi tafonomica e antropologica ha permesso di stabilire che insieme al complesso rituale funerario si sovrapponeva il processo naturale di mummificazione, derivante dalle condizioni di estrema aridità dell'area. La complessità delle diverse modalità deposizionali osservate ha richiesto un approccio flessibile e versatile, anche per ottimizzare la qualità delle informazioni ottenibili dallo scavo archeologico. La classica documentazione tafonomica è stata affiancata dall'elaborazione di modelli tridimensionali a partire da un'accurata documentazione fotografica, estendendo, al momento successivo allo scavo, la possibilità di valutare i rapporti tra gli elementi scheletrici all'interno delle sepolture secondarie e le relazioni spaziali tra le varie deposizioni, ma anche di evidenziare quelle tra le deposizioni primarie e le strutture murarie. L'analisi preliminare delle sepolture primarie ha evidenziato una *sex ratio* pari a 0,57 e la presenza di 14 individui infantili (il 50% del campione), testimoniando una buona rappresentatività del campione.

EARLIEST EVIDENCE OF PROTO-DENTAL TREATMENT IN THE LATE UPPER PALEOLITHIC

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Keywords: *Upper Paleolithic, Dental Care, Caries, Occlusal Fingerprint Analysis*

Prehistoric dental treatments have been known from the Neolithic - 9,000-7,500 years before present (BP) -, when the adoption of early farming culture caused an increase of carious lesions. They were extremely rare, and the few documented cases were characterized by *in vivo* perforation of the crown surface made by a drilling tool. Here we document the earliest evidence of proto-dental therapeutic intervention on a Late Upper Paleolithic (ca. 14,000 yr BP) modern human specimen from a burial in Northern Italy (Villabruna shelter). Using Scanning Electron Microscopy (SEM) we show the presence of striations deriving from the manipulation of a large occlusal carious cavity of the lower right third molar. The striations have a “V”-shaped transverse section and several parallel micro-scratches at their base, as typically displayed by cutmarks on teeth. Based on *in vitro* experimental replication and a complete functional reconstruction of the Villabruna dental arches, we confirm that the identified striations and the associated extensive enamel chipping on the mesial wall of the cavity were produced ante-mortem by pointed flint tools during scratching and levering activities. The Villabruna specimen is therefore the oldest known evidence of dental caries intervention, suggesting rudimentary knowledge of disease treatment well before the Neolithic. This study also suggests that primitive forms of carious treatment in human evolution entail an adaptation of well-known toothpickings for levering and scratching rather than drilling practices.

**LONG TRANSHUMANCE BETWEEN HIGHLAND AND LOWLAND SARDINIANS:
A SURNAME DISTRIBUTION ANALYSIS**

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Keywords: *Surnames, Demography, Telephone Directories, Transhumance, Sardinia*

The Monmonier's (1973) maximum difference algorithm was designed for the visualization on a geographic map of the trend data contained in matrices. It was used to analyze the relationships among Sardinian populations from five villages in the historical-geographical zone of Barbagia of Belvi, a mountainous area traditionally devoted to sheep-rearing and the point of departure of transhumance toward lowland areas. The Barrier Software was used in order to identify genetic barriers. The current surname structure of each population was determined from telephone directories and the structure in the first half of the 19th century from *Status Animarum* records. The data were compared with the current surname distribution, obtained from telephone directories, in lowland villages with a different environmental, historical-cultural and economic background, final destination of transhumance. The spread of surnames in Sardinia may have occurred by means of transhumance, occurring every year along precise routes from the pastoral mountain zones to the agricultural plains. The main aim is to find out if there was appreciable admixture between the Sardinian populations of the southern lowlands and those of the central mountains.

**IDENTIFYING THE GENETIC LEGACY OF PICENI:
A PRELIMINARY SURVEY FROM NOVILARA NECROPOLIS (PU), VIII-VII C. B.C.**

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Keywords: *aDNA, Population Genetics, mtDNA, Piceni, Novilara Necropolis*

The “*Piceni*” were an Italic civilization that lived, during the Iron Age, in the northern Adriatic coastal plain of Italy today corresponding to the region of Marche. The term “*Picenum Culture*” generally refers not so much to a homogeneous but rather to a heterogeneous cultural structure, characterized by local differences (especially between the North and the South of the region) that have been only scarcely interpreted.

The aim of this research is the genetic analysis of the skeletal remains from the necropolis of Novilara (PU), dating at VIII-VII c.B.C. This archaeological site represents an exceptional evidence due to the presence of more than 300 graves discovered until nowadays, with grave goods and osteological material in a good state of preservation.

In this study we have selected teeth and petrous bones as the samples of choice for the aDNA analysis. DNA was extracted from a first set of samples and sequenced for the first hypervariable region (HVR1) of the mitochondrial DNA (mtDNA), by using the state-of-the-art method. Preliminary results highlight matrilinear relationships among multiple inhumations of this necropolis, moreover suggesting genetic links between Piceni from Novilara and Villanovians from Bologna (VII c. B.C.). Ancient mtDNA data are also compared and contextualized within the genetic variability of present-day inhabitants of the same territories.

By providing the first genetic study about Piceni, we want to contribute at expanding the knowledge about the origins of ancient Italic civilizations and of their relationships with other coeval and modern populations.

SEX DIAGNOSIS IN HUMAN SKELETAL REMAINS: TESTING THE PHENICE METHOD AND INDEX OF SEXUALIZATION OF ACSADI AND NEMESKERI ON TWO MODERN (19TH-20TH C.) IDENTIFIED EUROPEAN SKELETAL COLLECTIONS

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Keywords: *Sex Diagnosis, Phenice Method, Index of Sexualization, Biological Profile*

Sex diagnosis is one of the basic approaches, with the age estimation, to reconstruct the biological profile of unknown human skeletal remains in both bioarcheological and forensic fields. Pelvis and skull are the most informative districts for sex diagnosis. In this work we have tested the reliability of Phenice method (1969) and index of sexualization of Acsadi and Nemeskeri (1970) on two modern (19th-20th c.) identified (sex, age-at-death, cause of death) European skeletal collections. Both methods were blind tested on a sample of 471 skeletons of individuals aged between 18-91 years from the Certosa Cemetery of Bologna (Italy) (N=229: 108 F, 121 M) and from the Coimbra collection (Colecção Esqueletos Identificados) (Portugal) (N=242: 122 F, 120 M). The Phenice method has confirmed the sex in 89% and 85% and the index of sexualization of the pelvis has confirmed the sex in about 100% and 97% of the individuals of the Italian and Portuguese collections respectively. Almost the same results have been found on the skull: sex was confirmed in 97% and 96% of the individuals of the Italian and Portuguese collections respectively. Regarding the pelvis the index of sexualization gives better results probably in relation to the greater numbers of features considered. These results have confirmed the reliability of these methods on two coeval populations coming from different geographical areas, attesting also a similar expression of sexual dimorphism in modern humans. Our results show that both methods could give reliable diagnosis in unidentified skeletal remains or isolated and fragmentary bones.

**THE OSTEOLOGICAL COLLECTION OF THE MUSEUM OF PATHOLOGICAL ANATOMY
“ANDREA VESALIO” OF VENICE**

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Keywords: *Museology, Venice, Paleopathology, Osteology*

On the 28th of October 2014, after a complex restoration, the new location of the Museum of Pathological Anatomy “Andrea Vesalio” of the Civil Hospital of Venice, was inaugurated. The exhibition is set up in the ancient corridor of the Scuola della Madonna della Pace di Venezia. The anatomopathological samples, taken during autopsies practiced between 1874-1980, are organized in nine showcases. The material accessible to the public is only a part of the collection, which consists of 789 samples divided according to the conservation techniques: wet and dry preserved specimens. Of great interest from anthropological and paleopathological points of view, is the osteological collection, which inspired two showcases displaying infectious, neoplastic and traumatic bone pathologies. Additional displays show the original collection of twenty-seven skullcaps taken during autopsies, according to specific techniques for removing the central nervous system. Among the *calvaria* cases of *hyperostosis frontalis interna*, Paget’s disease, bathrocephaly, plagiocephaly and hydrocephalus stand out. A collection of ten adult femurs offers an important opportunity to explain the link between medical and anthropological disciplines, with a particular emphasis on functional disability. Ongoing interventions are aimed at development of the exhibition and in-depth study of the material kept in laboratory storage.

L'AREA SEPOLCRALE DI PIAZZA CORRUBBIO A VERONA: ANALISI PRELIMINARE DEGLI INUMATI (ADULTI E JUVENES) PROVENIENTI DA SPECIFICHE TIPOLOGIE FUNERARIE

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Keywords: *Paleobiologia, Tafonomia, Età Tardo Antica, Alto Medioevo, Verona*

La necropoli di Piazza Corrubbio è stata intercettata per la prima volta nel 2009 dalle indagini preliminari per la costruzione di un parcheggio sotterraneo. Gli scavi archeologici eseguiti dalla dott. F. Meloni, sotto la Direzione scientifica della dott. G. Cavalieri Manasse della Soprintendenza per i Beni Archeologici del Veneto, hanno portato alla luce 249 tombe ad inumazione, di varia tipologia e grado di conservazione, oltre ad alcuni edifici conservati in modo residuale. Lo studio dei resti antropologici è l'oggetto di un progetto di ricerca in corso condotto dall'Università Ca' Foscari di Venezia e coordinato dalle Dott. D. Cottica e F. Bertoldi, in collaborazione con la Soprintendenza. Dalle analisi dei dati archeologici è stato possibile stabilire un lungo periodo di utilizzo della necropoli che va dal III secolo d.C. all'VIII-IX secolo. Lo studio antropologico ha interessato la prima fase cronologica di frequentazione dell'area sepolcrale, che registra un gran numero di sepolture a cappuccina ed in anfora. Sebbene le analisi paleobiologiche siano state completate su di un gruppo selezionato d'individui, propongono un quadro demografico affidabile ed in linea con quello di altri cimiteri coevi. Nel campione studiato vi è una buona rappresentazione d'individui *juvenes* ed adulti (rispettivamente 34 e 37 soggetti, 49% -51%) con una suddivisione equilibrata fra i sessi e tutte le età. La diagnosi di età alla morte ha permesso di notare, nella mortalità infantile, un picco compreso fra 1 e 3 i anni, in quella adulta uno tra i 35 e 45 anni per gli individui adulti di sesso maschile e 18 e 25 anni per adulti di sesso femminile. La presenza di individui di età perinatale in sepolture alla cappuccina e di adulti anche con sepolture in anfora, che copriva solo parzialmente il corpo, fa intuire una scarsa differenziazione di tipologie di sepoltura per età e sesso. Le condizioni generali di salute del campione sono discrete, interessante è la differenza fra il grado di sviluppo osseo e di sviluppo dentario del campione sub-adulto che in alcuni casi si palesa in soggetti con dentatura definitiva e uno sviluppo scheletrico di molto inferiore.

SAN GERMANO'S NECROPOLIS: THE DEPOSITIONAL ANOMALIES INSIDE IX TOMB

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Keywords: *San Germano, Etruscan Tomb, Human and Faunal Remains, Ritual Practices*

A recent research conducted by Soprintendenza dei Beni Archeologici della Toscana in collaboration with University of Florence at the necropolis of San Germano in the territory of Vetulonia has revealed an Etruscan tomb, which has a long period of utilisation, from the seventh to the third century B.C. The excavation has showed the presence of a large pseudo-tholos tomb, and has allowed the recovery of many fragments of vases, and bronze or precious metal objects, all pertinent to the grave goods. The tomb has also returned several human and faunal bones, coming from both the north cell and the burial chamber. In this two contexts, referred to different time periods, there was an under presentation of certain districts of human bones: almost absent vertebrae, ribs, pelvis, mandibles and craniofacial bones, as opposed to a good representation of long bones. The counting of the NMI has detected the presence of seven people in the central chamber and eight in the north cell. This lead us to suppose a possible deliberate reduction of human remains and / or their translation, made either at the time of the restoration of the tomb, - around the middle of the fourth century B.C., or at the end of the depositions in the burial chamber, in the second half of the third century B. C. It was perhaps at this time, after the collapse of the funerary monument's hedge, in the chamber, that some animal parts and pottery were also deposited. The analysis of faunas has showed the presence of domestic and wild species. Even in this case mandibles and cranial fragments are largely absent, while the limbs are the 80 % of the deposit. The hypothesis of ritual practices related to these findings must be verified, since a similar situation seems also documented in all the other mounds in the necropolis.

STUDIO DEI RESTI OSSEI CREMATI ATTRAVERSO TECNICHE CHIMICO-FISICHE

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Keywords: *Resti Umani Cremati, Antropologia Forense, Analisi Chimico-Fisiche, Diffrazione a Raggi X, Spettroscopia Infrarossa in Trasformata di Fourier*

Lo studio dei resti umani cremati è di grande importanza per l'archeologia, le scienze forensi e per le indagini nella scena del crimine.

Comprendere ed interpretare i cambiamenti che il corpo ha subito a causa della combustione può fornire importanti informazioni sul contesto e le condizioni della cremazione. Tali informazioni possono includere la temperatura, l'intensità e la posizione del fuoco e l'eventuale utilizzo di acceleranti.

La combustione provoca anche una serie di modifiche sostanziali che si verificano all'interno dello scheletro, che a loro volta possono influenzare o vanificare i tentativi di fornire una identificazione del defunto. La ricerca ha dimostrato che le metodiche morfologiche e metriche di valutazione antropologica vengono compromesse, così come i metodi di datazione e l'analisi degli isotopi stabili. Tradizionalmente, l'ispezione visiva dei resti è stata utilizzata per suggerire se le ossa sono state sottoposte a cremazione, e oltre a ciò, sono realizzabili associazioni tra il colore e il tipo di frattura dell'osso con la temperatura del fuoco e la presenza/assenza dei tessuti molli. Tuttavia, a queste metodologie autoptiche vengono ora sempre più spesso affiancate sofisticate analisi di tipo chimico-fisico per valutare la struttura cristallina e microcristallina delle ossa cremate, la quale a sua volta può essere collegata alla temperatura o intensità della cremazione. Le tecniche di diffrazione a raggi X (XRD) e spettroscopia infrarossa in trasformata di Fourier (FT-IR) sono state utilizzate in numerosi studi sperimentali e stanno trovando sempre più applicazioni nel mondo archeologico e in contesti forensi.

A GLOBAL STUDY OF SEX DIMORPHISM VARIABILITY IN MODERN HUMANS' CRANIA

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Keywords: *Howells, Sex Dimorphism, Morphometric, Populations*

In this study we collected and used morphometric data obtained by the literature published in the last decade (2006-2013) about the cranial sexual dimorphism in many modern human populations (Japanese, South West Asian, Iberian, Cretan, Australian, Brazilian, South African, North American and Indian). In the data set we also include the measurements that Howells reported in his book (1973) on 16 populations coming from different geographic regions. Applying bioinformatics methods, we did a cluster analysis to obtain a representation of the affinity between those population and an index of their heterogeneity. After this, utilizing the discriminant functions published in those papers, we tried to find the function which best discriminate the sex in order to obtain a common criteria to discriminate the sex with sufficient accuracy. From this analysis we can achieve morphometric data for a complementary approach to molecular ones, providing useful information about the origin and spread of modern human population from Africa. The final goal of this work is to begin to create the first global standard on the variability of sex dimorphism in modern humans crania, in order to better study and understand this phenomena in the oldest hominid.

**CHARTING THE MOST LIKELY GEOGRAPHICAL ORIGIN OF MATERNAL AND PATERNAL
HUMAN LINEAGES IN MIXED ECUADORIAN POPULATIONS**

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Keywords: *Ecuador, mtDNA, Y Chromosome*

Present-day Ecuadorian populations exhibit complex population structure due to different genetic contributions. Besides Native Americans, who make up nearly half of the total population, some groups are descended from the Spaniards who colonized Ecuador between the 16th and 19th centuries and intermixed to various extents with the autochthonous people, and the population of African ancestry, who are descended from slaves imported mainly from western Africa during the colonial era.

The remaining part of the population is composed of other mixed populations: the mulattoes of mixed European and south-Saharan African ancestry, and the mestizos and ladinos of mixed European and Native American ancestry.

Traces of these admixtures can be reconstructed by different genetic systems such as the Y chromosome and mitochondrial DNA (mtDNA).

In this work two mixed populations of Ecuador (Rio Cayapas and Viche) were analyzed.

To determine paternal lineages, 17 Y-STR loci using the AmpFSTR Yfiler Kit (Applied Biosystems, Forster City, CA, USA) were analysed. Then, through the High Resolution Melting (HRM) and SnapShot techniques we tested some diagnostic SNPs to confirm the haplogroup designation in relation to the haplotypes profiles.

The SNP genotyping was carried out by PCR Multiplex amplification, followed by Minisequencing reaction based on dideoxy Single Base Extension, performed with the SNaPshot multiplex kit (Applied Biosystems). Maternal lineages were identified by sequencing of hypervariable segments I and II of mtDNA D-loop regions and in some selected samples by the analysis of the entire mtDNA genome.

IMAGE ANALYSIS TECHNIQUES APPLIED ON A SAMPLE OF AUDITORY OSSICLES FROM SARDINIA

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Keywords: *Image Analysis, Auditory Ossicles, LDA*

The morphological and morphometric study of auditory ossicles plays an important role for the study of taxonomic and phylogenetic relationships in humans and other primates (Siori M.S. *et al.*, 1995). However, they are only rarely recovered in archaeological excavations and poorly represented in osteological collections. In this work are presented the results obtained from discrimination by image analysis technique on 29 auditory ossicles of both sexes from three archaeological Sardinians sites (Vico III Lanusei, San Sepolcro and San Eulalia) of the modern period. Twenty-six morphometric features of these cranial elements were measured by the open source software ImageJ v.49.

The achieved results were used to implement a database of morphometric variables that was applied to carry out a statistical classifier, based on the stepwise *Linear Discriminant Analysis method (LDA)*. The aim of this study is to test a new modern method, able to make accurate repeatable measurements in comparison to traditional one.

DETECTING SIGNATURES OF GENETIC ADAPTATION TO CLIMATE IN EUROPEAN POPULATIONS

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Keywords: *Thermogenesis, Climate Adaptation, Brown Adipose Tissue, PRDM16*

In the last 100,000 years, behaviorally modern humans have spread from Africa to colonize most of the globe, being thus forced to adapt to a wide range of new habitats and climates.

By analyzing this period of changes over human evolutionary history, several studies have conjectured that non-Africans populations might have experienced greater selective pressures to adapt to new environments than Africans one. Moreover, global distribution of a large amount of SNPs in contemporary human populations has been shown to have strong latitudinal basis, suggesting a clear influence of climate-driven selection on their variation patterns.

In the adaptation to new environmental conditions, thermoregulation processes plausibly played an important role. In mammals, they are linked to biological functions of the two predominant adipose tissues: the white and the brown ones.

In silico analyses performed on a wide list of genes involved in such processes pointed to *PRDM16* as one of the most important genes devoted to regulation of brown adipose tissue differentiation and of the efficiency of human thermoregulation. In particular, we performed several population structure analyses highlighting clear differentiation at this locus among European populations along a North-South gradient.

To further investigate the evolutionary meaning behind this differentiation, a number of neutrality tests were performed leading to the identification of signatures of balancing and positive selection occurred on European populations in different time intervals. A set of candidate SNPs pointed out by these analyses is also planned to be typed on a large sample of Italian individuals to test for potentially different climate-related selective pressures having acted on the populations settled along the peninsula.

This study was conducted within the framework of the EPIC project (PRIN2012).

CRONOLOGIA DELLO STRESS INFANTILE: I CASI DI ISOLA SACRA E VELIA PORTA MARINA

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Keywords: *Smalto, Cronologia, Stress, Linea Neonatale, Linee Incrementali Anomale*

L'istomorfometria dello smalto che riveste le corone dentarie umane offre l'opportunità unica di ricostruire un quadro esaustivo dei livelli di vita e dello stato di salute del segmento giovanile di una popolazione archeologica.

Le rigorose modalità di accrescimento di questo tessuto, combinate con l'elevato grado di mineralizzazione, rendono lo smalto un database naturale di eventi che in qualche modo intervengono sull'individuo alternandone il normale sviluppo di crescita.

In aggiunta, i denti decidui, che cominciano a formarsi nelle prime settimane di vita fetale, diventano uno strumento di indagine unico per informarsi su un periodo della vita che altrimenti resterebbe sconosciuto, cioè quello della vita prenatale.

Le necropoli di Velia Porta Marina (Campania I-II secolo AD) e Isola Sacra di Porto (Lazio I-III secolo AD) hanno restituito un campione di età infantile importantissimo per consistenza numerica e per ottimo stato di conservazione.

Per entrambi i campioni sono stati esaminati in sezione sottile - e con l'ausilio dell'analisi digitale di immagine - elementi della dentizione decidua relativi ad infanti di età inferiore ai 5 anni.

L'individuazione delle linee incrementali di spessore anomalo, risultato di interruzioni momentanee nello sviluppo del dente, e la determinazione della cronologia degli eventi di stress costituiscono la base per un confronto tra le porzioni giovanili delle due popolazioni.

**THE PALEOPATHOLOGICAL COLLECTION OF CAGLIARI UNIVERSITY:
CASE STUDIES AND FUTURE PROPOSAL**

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Keywords: *Museum Collection, Paleopathology, Sardinia*

The Sardinian Museum of Anthropology and Ethnography of Cagliari University was founded during the '50s as a result of the efforts of Carlo Maxia (1907-1996). The Ethno-Anthropological collection includes several human skeletal remains in a good state of preservation, from Sardinian excavations or findings dated from protohistory to historic period. In the last years, the osteological collection has been inventoried and restored in order to estimate the actual amount and to preserve it. In the present work we report the preliminary analysis based on a sample of Sardinian remains with pathological evidences, for each one have been realized cataloguing cards containing paleobiological information. The study here presented, due to the large amount of the skeletal material not investigated yet, is an important occasion to suggest new anthropological projects.

THE BURIALS OF SAN GIULIANO CHURCH (SELARGIUS, SARDINIA): PRELIMINARY DATA

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Keywords: *San Giuliano (Selargius), Human Skeletal Remains, Paleobiology, Paleopathology*

Between 1984 and 1986, during the consolidation and restoration of the Romanesque Church of San Giuliano (Selargius, Sardinia), some inhumations dated to different chronological phases (XI-XIII AD and XVIII-XIX AD) were found. The excavations, carried out by Soprintendenza Archeologica per le province di Cagliari e Oristano, by Soprintendenza ai B.A.A.A.S of the same provinces and the city council, covered the Church in its total extension. The reconstruction of biological profile was made difficult due to the lack of archaeological information. In the sample here presented, the traditional anthropological methods for the estimation of biological and pathological characters were applied. The results suggest the presence of infant and adult individuals, both male and female. In this work, currently in progress, we report the preliminary investigations conducted on a small sample of a population of Southern Sardinia.

GENOMIC ANCESTRY OF SOUTHERN ITALY: INSIGHTS INTO THE COMPLEX ADMIXTURE HISTORY AND THE RECENT CULTURAL HERITAGE

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Keywords: *GenoChip 2.0, Population Structure, Linguistic Minorities, Sicily and Southern Italy, Mediterranean*

Present-day inhabitants of Sicily and Southern Italy are the complex result of multilayered migration processes and long-standing events of admixture. While previous genetic studies were mainly confined to uniparental markers, genome-wide variation patterns of this area have not yet been investigated with a dedicated high-resolution approach. Here, we assembled a large dataset including newly generated data from Sicily, Calabria and Apulia as well as from Albania and Greece. In addition, remarkable samples from Arbereshe and Grecani ethno-linguistic minorities were included to expose genetic links and gene-culture interaction patterns. Overall, 511 samples from 23 populations were genotyped on the Illumina GenoChip Array (~150,000 SNPs). Analysis of the autosomal genomic variation reveals a significant homogeneity among different populations, spanning from Sicily to Apulia. Interestingly, Sicilian and Southern Italian samples appear more closely related with people from Greek-speaking islands (e.g. Crete and Cyprus), while continental Greece clusters mainly with Albanians. If the first result may suggest migratory paths from Anatolia to Italy through Mediterranean routes involving Aegean-Greek Islands, subsequent genetic exchanges within the Balkan Peninsula may account for the mainland-Greek/Balkan similarity. As for the considered ethno-linguistic minorities, Albanian-speaking Arbereshe are the only case in which the genetic continuity with Balkan-source groups is confirmed. Greek-speaking minorities of Apulia cluster with present-day Southern Italians suggesting admixture events with neighboring populations in spite of linguistic differences, while Greek-speaking groups of Calabria configure themselves as genetic outliers showing a private genetic component. Ongoing analyses, aimed at expanding the comparisons to a wider Mediterranean perspective, will provide further insights into these preliminary surveys.

**A FORENSIC APPROACH TO THE ANALYSIS OF SHARP FORCE TRAUMA
ON AN ARCHAEOLOGICAL CRANIUM: POTENTIALS AND PITFALLS**

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Keywords: *Perimortem Injuries, Sharp Force Trauma, Cranial Lesions, SEM-EDS, Archaeology*

Finding signs of bone trauma in a forensic case necessarily brings about relevant questions concerning the reconstruction of the number and sequence of lesions, the type of weapon, the cause of death and time of survival, which are usually faced in forensic analyses. However the same questions arise in archaeological cases, although the application of forensic techniques and reasoning is less common.

The authors present the case of a young adult male (25-29 years), found in a grave in the archaeological area of Rossilli (Gavignano, Rome), dating back between the Roman age and 18th century, affected by five perimortem sharp wounds on the cranial vault.

The application of forensic techniques, together with the microscopic analysis by SEM-EDS allowed the authors to shed light on the manner and modality of lesions and to reconstruct the possible cause and manner of death. At the same time, this case underlines the limit of forensic procedures, especially for what concerns the specificity of the archaeological context, and suggest caution in applying trauma analysis to the study of ancient human remains.

MAPPING OF THE TATTOOS OF THE 5300 YEAR OLD TYROLEAN ICEMAN

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Keywords: *Mummy, Tattoos, Ötzi, Tyrolean Iceman, Hypercolorimetric Multispectral Imaging (HMI)*

This study documents for the first time the complete mapping of one of the world’s most ancient tattoos present on a mummified human body dating back to over 5300 years ago, belonging to the so-called Iceman mummy. For this purpose, we utilised innovative non-invasive multispectral photographic imaging techniques capable of “seeing” in a range from IR to UV.

An especially developed innovative software Hypercolorimetric Multispectral Imaging (HMI), which allows to measure and process the spectral reflectance sampled on seven bands with equidistant wavelengths for each pixel of scene acquired, has led us to identify and certify the presence of 61 tattoos divided into 19 groups in various parts of the body.

The presence of the tattoos and their precise positioning on the mummy’s body shall prove helpful in the future for the in-depth analysis of their relationship with recent scientifically acquired knowledge, to help determine the real function of tattooing in prehistoric times.

**ANALYSIS OF CREMATION RITUAL IN LATE BRONZE AGE NECROPOLIS
OF CASTELLO DEL TARTARO (CEREA, VR)**

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Keywords: *Cremation, Bronze Age, Burned Bone, Funerary Ritual*

The Bronze Age of Castello del Tartaro sites is located near the town of Cerea (Vr) and it is one of the most important site surrounded by an embankment and a moat in the Great Veronese Valley. The necropolis object of this study, dated to the Late Bronze Age is characterized by two funerary practices: inhumation burials and cremation. This study comprises cremated bones recovered from 29 graves, discovered during the excavations conducted between 2006 and 2012. The anthropological analysis of cremated human remains provides information about the biological profile of the individual (determination of sex and age at death), and on the funeral ritual used for cremation. The analysis of bone deformations during combustion established that the ritual crematorium in this necropolis happened to fresh corpse, immediately after the death of the individual. The preliminary anthropological study attests the presence of single and multiple depositions in an urn. The temperatures of combustion determined by the color of the bones according to Holck (1986) and Shipman (1984) attest a temperature range between 200° C (grade 0 for Holck, phase I of Shipman) and 900° C (grade 3 for Holck, phase IV of Shipman). Cremation was complete and probably occurred in a similar way for all individuals. Furthermore, the discovery of animal bone fragments commingled to human ones attests the practice of funeral banquet in honor of the deceased and the food offerings burned on the funeral pyre.

**RECONSTRUCTION OF THE MATERNAL GENETIC HISTORY OF THE CAYAPAS
AND TSACHILAS AMERINDIANS POPULATION FROM ECUADOR**

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Keywords: *Ecuador, Cayapas, Tsachilas, mtDNA*

The aim of this work is the characterization of the mitochondrial gene pool of 99 Cayapas and 77 Tsachilas Amerindians, who are scattered through the northern provinces of Ecuador. Several authors stated Tsachilas and Cayapas retain much of the ancient Chibchan culture, which originally spread throughout all what now is Colombia, so they probably should share some genetic features accounting their relationship. Mitochondrial hypervariable regions sequence data were generated and diagnostic single nucleotide variants were identified to classify the haplotypes. The results show that all the haplotypes in both human groups could be comprised in the four haplogroups A2, B4, C1 and D, and some haplotypes are shared by the two Amerindian groups.

The obtained data are assessed for relationship reconstruction: a compiled database of several Amerindian populations is segregated and resolved in clusters corresponding to the ethnogeographic distribution of the populations. This analysis of Central and Southern Amerindians allowed us to support a historical hypothesis related to a common origin and migration of these Ecuadorian people.

**TRAUMATIC EVIDENCES ON HUMAN SKELETAL REMAINS IN THE NECROPOLIS
OF ST. BIAGIO, RAVENNA, XVIII CENTURY**

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Keywords: *Bio-Archaeology, Paleopathology, Trauma, Ravenna*

In the year 2013, archaeological excavations brought to light numerous human remains in an area adjacent to St. Biagio' church in Ravenna. These remains have been dated between 1600 and 1800.

This study aimed to analyze skeletal trauma affecting two of the recovered skeletons.

A macroscopic trauma assessment was carried out. Age estimation and sexing was based on standard morphometric methods.

The former case (US 114) concerns an adult man showing a chop wound involving the right supra-orbital ridge, probably inflicted by an heavy and cutting weapon. Other traumatic injuries (cut marks) were observed in the other case (US 118), also involving an adult man. These lesions were probably inflicted by a small and sharp-edged weapon.

The pattern of trauma are described in detail together with possible implications and causes.

**A POSSIBLE CASE OF OSSEOUS FIBROUS DYSPLASIA FROM THE CERTOSA
MONUMENTAL CEMETERY OF BOLOGNA**

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Keywords: *Paleopathology, Fibrous Dysplasia, Computed Tomography, Differential Diagnosis*

The analysis of diseases directly observable on human skeletal remains deriving from archaeological contexts has an important role to reconstruct the history and evolution of pathologies. The present study shows a possible case of osseous fibrous dysplasia, a rare disease, reported for the first time in Europe in 1922 by Wieland, later renamed to its current name coined by Louis Lichtenstein in 1938. Here we display the case of the cranium of an adult, probably a woman, with no post cranial skeleton, discovered in an ossuary of the Certosa of Bologna - Monumental Cemetery. The ossuary refers to an area used between 19th century and the first half of the 20th century. The cranium presents an abnormal growth of bone tissue of the right maxillofacial region with involvement of the cranial vault, the mandible and the temporomandibular joint. The macroscopic observation of the alterations, combined with the digital analysis by computed tomography (CT) along with the 3D reconstruction of the cranium, has revealed the presence of areas with low radiopacity and homogeneous density, usually described in scientific literature as "ground glass". These pieces of evidence are compatible with a preliminary diagnosis of fibrous dysplasia of the maxillofacial region with involvement of the adjacent bone regions. Nevertheless some studies show that this disease doesn't have a pathognomonic aspects detectable exclusively by CT imaging. For this reason the preliminary diagnosis of osseous fibrous dysplasia suggested for the cranium object of this study will be verified and possibly confirmed through subsequent histological and genetic exams.

**DECIPHERING THE IDENTITY AND SETTLEMENT OF “PHOENICIAN-PUNIC” CIVILIZATION:
A COMPREHENSIVE GENETIC STUDY ON THE THARROS SOUTHERN NECROPOLIS (OR)**

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Keywords: *Phoenician-Punic Archaeology, Tharros, Population Genetics, aDNA, mtDNA*

The timing and modalities concerning the identity and expansion of the “Phoenician” civilization and the formation and diffusion of the “Punic” culture - linked to the Carthage cultural and territorial expansion - represent in the phoenician-punics studies a vexed question.

In order to contribute to the reconstruction of the “phoenician-punic” settlement in the central-western Mediterranean area, a research project has been started in the Tharros southern necropolis (OR) based on a multidisciplinary approach that combines the contributions of archaeological, anthropological and genetic investigations *in primis*.

Furthermore an innovative protocol has been developed, in respect with the ultimate procedures set up in these field studies. In all phases of research, from the *in situ* sampling to the laboratory analyses, skilled archaeobiologists were present. Contamination is utmost concern when working with ancient DNA, so an important starting point in this study was precisely to have initiated precautionary measures from the sample collection on the field.

In the present study, conducted on a first selection of bone samples, classical methods of mitochondrial DNA analysis (HVRI) have been combined with new generation techniques (NGS). Also every member of ours working team have been genotyped to exclude contaminations.

This research therefore provides a pioneer survey in the phoenician-punic context, to define the target population and expand the knowledge on migration flows and the relationship between ancient and modern populations. It enables to trace the ethnic origin and understand whether will be maintained a genetic continuity with those who nowadays still live in the same territories.

EAR BONES IN NON HUMAN PRIMATES: A MORPHOMETRIC CONTRIBUTION TO TAXONOMY

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Keywords: *Auditory Ossicles, Non-Human Primates, Morphometry, Taxonomy*

The morphometry of ear bones has been of interest in different research fields despite of the rare opportunity to study these ossicles because of the difficulty in recovering and collecting them. In particular, their significant role in primate taxonomy and phylogeny has known for a long time. The aim of this study is to extend the knowledge of their morphometric variations in non-human primates and to further explore their systematic value in infraorder as well as in genus level assignments. To highlight the anatomic features that contribute most to taxonomic differentiation and to analyse the differences between the infraorder and genus groups, discriminant analyses were applied to the linear measurements of 139 mallei and 125 incudes from the primatological collection stored in the Life Sciences and Systems Biology Department of the University of Torino. The stapes, was excluded from multivariate analyses because often missing or fragmented. The results of the comparisons at the infraorder rank confirmed the taxonomic usefulness of these structures, with Catarrhini and Platyrrhini having a correct classification of 100% and Lemuriformes of 57.1%. Challenging outcomes have been also obtained in the comparison of 29 genera of primates: all genera but *Hylobates*, *Macaca*, and *Eulemur* were successfully classified. The variables of total size, the features of the malleus manubrium and of the incus apophyses, their reciprocal relationship included, have proved to be the most significant in taxonomic discrimination. Future plans involve upgrading the collection with new specimens and taxa to enhance morphometric studies to genus and species levels.

**JESOLO, LOCALITÀ LE MURE: PRIMI RISULTATI DELL'ANALISI TAFONOMICA E
PALEOBIOLOGICA DEGLI INUMATI RINVENUTI NELL'AREA CIMITERIALE
DI EPOCA ALTO-MEDIEVALE**

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Keywords: *Paleobiologia, Archeologia, Alto medioevo, Veneto*

Dal 2013 l'Insegnamento di Archeologia Medievale dell'Università Ca' Foscari di Venezia in collaborazione con la Soprintendenza per i Beni Archeologici del Veneto e con il Comune di Jesolo ha effettuato le prime campagne di scavo e ricerca presso la località "Le Mure" a Jesolo (VE).

Nelle aree di scavo UTS1000 (nel 2013) e UTS3000 (nel 2014) sono state individuate 38 sepolture, delle quali 36 scavate e solo 2 individuate, riconducibili probabilmente all'area cimiteriale annessa alla basilica paleocristiana di VII secolo d.C. Si tratta in tutti i casi di inumazioni singole con i defunti in decubito dorsale in fosse terragne semplici, ad eccezione di alcune sepolture di neonati ricavate all'interno di anfore. Gli individui, rinvenuti in giacitura primaria, presentavano segni evidenti di alterazioni post-deposizionali causate perlopiù da lavori di aratura avvenuti in passato: alcuni inumati risultano infatti incompleti o presentavano, al momento dello scavo, evidenti dislocazioni di alcune ossa. La maggior parte delle sepolture aveva orientamento ovest-est mentre le tombe 3, 5, 17 e 24 erano disposte nord-sud. Dei 36 inumati scavati 16 risultano adulti e 20 *juvenes*: di questi ultimi ben 9 sono individui di età perinatale (tombe 5, 27, 31, 32 e 33 sepolti in anfora). Dei 16 adulti 10 sono femmine, 5 sono maschi mentre un individuo è rimasto indeterminato. In questa sede viene proposto lo studio preliminare del campione che comprende sia lo studio paleodemografico e paleopatologico, che l'analisi dei caratteri metrici e morfometrici del cranio e del post-craniale e dei caratteri ergonomici e discontinui.

INTRACEMETERY BIODISTANCE ANALYSIS AND FUNERARY PATTERNS OF THE ETRUSCAN-CELTIC NECROPOLIS OF MONTERENZIO VECCHIO (BOLOGNA, ITALY)

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Keywords: *Dental Morphology, Intracemetery Variation, Biodistance, Funerary Pattern, Monterenzio Vecchio*

The 4th century marks the entrance of Celts in Northern Italy. The archaeological and epigraphic documentations show different interactions between Celtic tribes and Italian indigenous populations, with the possibility of hostile situations or integration models. A cultural syncretism of Transalpine Celts customs with Etruscan practices has been identified in a mortuary context in the necropolis of Monterenzio Vecchio (4th to 3rd century B.C.). This archaeological evidence suggests integration between newcomers and local Etruscan communities, but up to now there are no biological data useful to support or reject this hypothesis. In this contribution we aim to assess whether both Celtic and Etruscan individuals coexist in the same community through the analysis of aggregate phenotypic variability. Intracemetery biodistance analysis based on 16 non-metric dental traits was conducted on 19 individuals and analyzed using Non-parametric Multidimensional Scaling of Euclidean distances. Moreover, a cluster analysis (Ward's method) based on nine funerary patterns (on a subsample of 17 individuals) was carried out to identify possible correspondence between biological and funerary data. The results show a correspondence among the individual biological distances, the spatial distribution of the burials and their relative dating. Moreover, the biological relationship among individuals is supported by the repartition obtained from the cluster analysis. These results suggest that Celts and Etruscans coexisted in Monterenzio Vecchio, and support the hypothesis of a peaceful coexistence between the two ethnic groups.

**AGE-AT-DEATH ESTIMATION IN IMMATURE SKELETAL REMAINS:
TESTING OF SIX METHODS ON A MODERN (19TH - 20TH C.) IDENTIFIED ITALIAN COLLECTION**

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Keywords: *Dental Development, Skeletal Maturation, Age At Death Estimation, Subadults*

In bioarcheology, accurate age estimation of immature remains is crucial for the reconstruction of the demographic structure, health status and growth patterns of ancient populations. Many standards based on the observation of skeletal and dental maturation have been developed. In the attempt to avoid biased reconstruction of biological profile, the available standards need to be tested on identified skeletal collections coming from different areas and periods in order to assess the inter-population variability. In this work six methods based on dental development (AlQahtani et al., 2010, Ubelaker, 1989), maximum diaphyseal length (MDL) (Ubelaker, 1989, Stloukal and Hanakova, 1978, Maresh, 1970) and linear growth of the basiocciput (Scheuer and MacLaughlin-Black, 1994) have been tested on a identified (age, sex and cause of death) skeletal sample of 112 children, died in Bologna (Italy) between 1900 and 1901. The sample includes 56 males and 56 females, ranging from birth to 7 years and 8 months of age. Bias ($\Sigma[\text{estimated age} - \text{actual age}]$) and inaccuracy ($\Sigma|\text{estimated age} - \text{actual age}|$) have been calculated for all the methods. Overall, dental age methods proved to be the most reliable, with the lowest values of bias (<1 month) and inaccuracy (between 3 and 4 months), while MDL methods show the highest value of both bias and inaccuracy. Linear growth of the basiocciput provided reliable age estimates, with values of bias and inaccuracy within 2 and 4 months respectively. Finally, for all the applied methods, inaccuracy tends to increase with age.

**A POST-TRAUMATIC OSTEOMYELITIS CASE ON PARTIALLY MUMMIFIED HUMAN REMAINS
(ROCCAPELAGO, MODENA, 17TH CENTURY)**

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Keywords: *Paleopathology, CT Scan, 3D Virtual Model, Injury*

Between 2009 and 2011, during restorative works at the Church of Roccapelago (province of Modena, Italy), hundreds of bodies, some of them mummified due to natural processes, were discovered in a forgotten crypt. Mummification processes occurred unevenly, with bodies partially skeletonized and bodies only partly articulated. During the anthropological study, a skull was found with a large osteolytic lesion on the right maxillary sinus, with peripheral osteoproliferative reactions. Here we present a case of post-traumatic osteomyelitis in an adult male skull (>50 years old) dating back to the 17th century. The diagnosis was based on macroscopic evidences and computer tomographic (CT) images. A virtual 3D reconstruction of the skull, obtained from the CT image data, was used for a kinematics analysis of the trauma. The lesion is consistent with osteomyelitis with bone sequestration, probably developed following a severe comminuted open maxillary sinus fracture, caused by a blunt force directed from below through the sinus to the roof of the orbit. Further analyses will entail ancient DNA to identify bacterial pathogens associated with the pathology.

**GENETIC VARIABILITY IN A LATE NEOLITHICMEGALITHIC BURIAL FROM POLAND:
THE GLOBULAR AMPHORA CULTURE AND THE INDO-EUROPEAN DEBATE**

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Keywords: *Ancient DNA, NGS, Indo-European, Late Neolithic, Kurgan*

Archaeological evidence shows a marked discontinuity in Late Neolithic farming societies in Europe: large settlements were abandoned, anthropomorphic figurines and painted pottery disappeared. Some scholars, as Gimbutas, interpreted these changes hypothesizing a migration of pastoral groups from the steppes of southern Ukraine, also associated with the spread of proto-Indo-European languages (Kurgan hypothesis). The Globular Amphora culture assumes a crucial role in this theory. It was distributed across central and eastern Europe, from the Elbe to the middle Dnieper, around 3400-2800 BC and was characterized by an apparently mobile economy, presence of domestic horse, distinctive pottery and burial rituals. Furthermore, the physical type of the Globular Amphora population was regarded as similar to those of the steppe region. Alternative explanations have been put forward for the spread of Indo-European languages, including Renfrew's theory based on the Neolithic demic diffusion, and the Armenian hypothesis by Gamkrelidze e Ivanov. We selected 17 individuals from the Megalithic barrow of Kierzkowo (Poland, Kujawy-Pomorze), an excellent example of rituals of the Globular Amphora culture. We are applying advanced molecular procedures based on Next Generation Sequencing and target enrichment in order to analyze genetic variation in this community. Our aim is to contribute to the Indo-European debate, by comparing our data with the available genetic data about ancient and modern Europeans, quantifying population relationships, and testing for the possible demographic implications of the Kurgan hypothesis upon the Globular Amphora culture.

**EXPLORING DIETARY VARIABILITY IN PREHISTORIC CENTRAL ITALY:
A MULTI STABLE ISOTOPE APPROACH**

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Keywords: *Bronze Age, Tuscany, Latium, Prehistoric Diet, Stable Isotopes*

The study of food choices of farmers and herders contributes to define agricultural and economic activities, paleoenvironment trends and social relationships. The complexity of dietary practices in Prehistoric Italy has always been debated because of the specific and varied Italian ecosystems. The aim of this research is to delineate the alimentary pattern to understand the food resources management in Central Italy during the Bronze Age, little explored until now. Recent researches conducted in other area of the Peninsula have shown that the Middle Bronze Age is a crucial period of transition for the introduction of new agricultural products. Consequently to these first results, we present the data obtained from four Bronze Age sites in Tuscany and Latium: Grotta dello Scoglietto, Grotta Misa, Felcetone and Grotta Vittorio Vecchi. 42 human and 30 animal collagen samples have been analysed: stable carbon, nitrogen and sulphur isotopes ratios highlighted four different dietary patterns that suggest various food choices linked to a probable introduction of fish (Grotta dello Scoglietto), legumes (Felcetone and Grotta Vittorio Vecchi) and C₄ plants like millets (Felcetone and Grotta Misa). These differences are due to local environmental, social complexity and possibly different purposes of the area chosen for the necropolis. We can deduce that the transition from the Early to the Middle Bronze Age represents a moment of change for the investigated area, which is well reflected by the presence of different dietary habits.

**MITOCHONDRIAL GENE POOL CHARACTERIZATION OF AN AMAZONIAN POPULATION:
THE YANOMAMI**

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Keywords: *mtDNA, Amazonia, Human Hair Shafts, Isolated Population, Native Americans*

Pre-Columbian history of Amazonia is quite difficult to reconstruct due to the lack of information supplied by archaeological and written evidence, thus genetic characterization of Amazonian populations could provide a significant contribution in understanding their genetic landscape. In particular, since African and European post-Columbian admixture, uniparental genetic markers studies can be very explicative.

In this study we focus on the analysis of the mitochondrial gene pool of a sample of one of the most ancient and numerous Amazonian populations: the Yanomami. Today they live in a wide territory on the boundary between Brazil and Venezuela and speak several languages classified within an isolated Amazonian linguistic family: the Yanomaman. Such a population has remained in relative isolation until the second half of the twentieth century, when the first contacts with Europeans occurred.

We analyzed samples belonging to a collection of 174 human head hair shafts collected in 1958-1960 during a scientific campaign in the Brazilian Amazon Basin. After an automated DNA extraction, hypervariable segments I and II of the mitochondrial DNA (mtDNA) control region were investigated and subjects were classified within a haplogroup according to the mutation patterns identified in those regions. The results revealed that almost all subjects belong to one of the Native American mtDNA haplogroups A2, B4, C1 and D1/D4. At last, in order to explore the genetic variability among Amazonian populations both linguistically and geographically, comparison with several populations from different Amazonian areas and speaking different languages was carried out.

**ANALYSIS OF THE WEAPON-RELATED INJURIES IN LATE ANTIQUITY NECROPOLIS
OF MODENA BASED ON VIRTUAL DATA**

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Keywords: *Late Antiquity, CT Scan Analysis, 3D Virtual Model, Injury, Ancient DNA*

Human skeletal remains from archaeological contexts could often disclose signs of traumatic injuries from ancient weapons that can reveal the interpersonal violence grade, the type of weapon equipment and the fighting techniques of a specific historical period.

The aim of this work is to analyze and describe traumas in the human skeletal remains dated back to late Antiquity (V-VI centuries AD), discovered during archaeological excavations in Modena (MO), besides it's intended to describe how such injuries were inflicted and the consequences of generated traumas. The research project aimed also to characterize individuals from an anthropologic and genetic point of view in order to identify the geographic origin of this population.

Traumas were observed in four out of the thirteen individuals recovered from the excavation. Anthropological examinations reveal that they are all adult males. The edges of the lesions and the degree of penetration into the bone show sharpness of the weapon. The lesions observed suggest that the hitter was an expert fighter, for their precision and the choice of target. On the other hand, the injuries observed, along with the study of biomechanical stress indicators, suggest that those who suffered the blows did not fight regularly and did not wear appropriate armor.

A more in-depth analysis, with an overview of the genetic, anthropometric, archaeological and virtual data, could provide a better necropolis characterization and add new data to the study of weapon-related injuries.

GENETIC VARIABILITY OF THE *GPX1* AND *GPX3* GENES IN THE PATHOGENESIS OF ASTHMA

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Keywords: *Single Nucleotide Polymorphisms, Susceptibility, Respiratory Disease, Allergic Disease*

Asthma is one of the most common chronic diseases in modern societies. The interaction between numerous environmental influences and the genetic predisposition makes asthma a complex disease and several studies have indicated that oxidative stress impairs pulmonary function. Glutathione peroxidases (GPXs) are the major enzymes in the antioxidative defence mechanism depending on glutathione (GSH). The aim of this case-control study was to analyze the putative role of the GPX gene polymorphisms in the development of asthma in 180 asthmatic patients and 180 healthy controls. Biological samples were recruited from the Department of Internal Medicine of "San Giovanni Calibita Fatebenefratelli" Hospital of Rome. We screened genomic DNA extracted from buccal cells for *GPX1***Pro200Leu* (rs105045) polymorphism and for a *GPX3* gene variant located in 3'-UTR (rs2070593). Genotyping was performed by RFLP-PCR assay for *GPX1* and by direct sequencing for *GPX3*. The χ^2 -test, odds ratio (OR) and logistic regression were used as statistical analyses. Significant differences in genotype distribution between asthmatic patients and healthy controls were found for the *GPX1* and *GPX3* polymorphisms ($p < 0.05$).

This study provided some interesting information on the interaction between genetic predisposition and exposure to environmental risk factor in the development of asthma. In particular, *GPX1* and *GPX3* gene polymorphisms seem to be related to asthma susceptibility in the Italian patients.

TORRECUSO (BENEVENTO): STUDIO PRELIMINARE DI UNA POPOLAZIONE SEICENTESCA

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Keywords: *Antropologia Fisica, Paleopatologia, Paleodemografia*

In seguito al restauro della Chiesa della SS. Annunziata a Torrecuso (Benevento, Sud Italia), sono state ritrovate delle stanze sotterranee piene sia di resti umani scheletrizzati che resti mummificati, posizionati in modo disordinato. Attraverso lo studio antropologico si è stimato il numero minimo di individui, mediante lo studio di crani, femori e bacini evidenziando l'alto numero di individui presenti (circa 5400), e si è ricostruita la struttura demografica per sesso ed età del campione di popolazione (sono attestate tutte le classi di età) e si è proceduto allo studio delle patologie. L'esame patologico dei resti umani ha evidenziato numerose affezioni interessanti, probabilmente legate alla presenza prima in loco, e poi nelle vicinanze della chiesa, di un ospedale o, comunque, di una struttura adibita alla cura degli individui. Ipotesi questa sottolineata anche dalla presenza di rinvenimenti legati alla studio dell'anatomia umana e all'esecuzione di pratiche mediche (presenti infatti numerose craniotomie complete o parziali). Tra le patologie rinvenute si hanno: traumi, malattie infettive, disordini metabolici, anomalie congenite, tumori, osteoartrosi, patologie dentarie, sindesmopatie ed entesopatie.

PALEODIETARY PATTERN FROM SPANISH NEOLITHIC CAVE “CUEVA DE CHAVES” (HUESCA)

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Keywords: *Neolithic, Paleodiet, Stable Isotope, Carbon, Nitrogen*

The use of molecular analysis in Neolithic remains has proved very useful to determine the socio-economical impact of farming practices in ancient populations. Specifically, paleodiet studies through carbon and nitrogen stable isotope analysis from bone collagen can be used to establish the subsistence model of the first shepherds and farmers. Moreover, comparing the Neolithic diet results with hunter-gatherer data, could identify the change of diet habits due to the introduction of agriculture practices.

The aim of this study is to show the preliminary results of carbon and nitrogen stable isotope analysis of humans and faunal remains from the Neolithic levels of Chaves cave situated in Spain (Bastarás, Huesca). From these results, a description of the subsistence model for humans who lived in this cave in Neolithic period is expected, as well as determining the availability of natural resources in paleoambiental conditions, which would further the knowledge about one of the oldest neolithical sites located in Spain.

Human remains belonging to 6 individuals and faunal remains from 14 different species were analyzed. Preliminary results confirm faunal remains were located in different levels of food chain, herbivores, omnivores and carnivores. Human remain results show high variability among the samples analysed highlighting a great variability of food resources available in Chaves cave area. Moreover, high protein intake from terrestrial resources was observed in all individuals from Chaves cave.

**ANTHROPOMETRICAL AND NUTRITIONAL SURVEY OF PROFESSIONAL
HIGH SCHOOL STUDENTS IN BARI, ITALY**

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This paper reports the results of a survey of the physical structure and nutritional state of students at professional and technical high schools in Bari (central Apulia, Italy).

A total of 720 students (300 boys, 420 girls) aged 13-20 were examined during academic year 2013-14. Data from a similar survey in 1997, carried out at another technical high school in Bari, were used for comparisons. Standard anthropometric variables were recorded. Impedentiometric, nutritional and behavioral data were also collected, with particular attention to lifestyle.

Male anthropometric values fell within national reference data, except for height and weight, which are both higher. On the basis of nutritional evaluators (BMI), the numbers of overweight (18.3 %) and obese (6.0 %) subjects are not negligible. Height and weight are comparable to those recorded in a similar school in 1997. However, at that time, the number of overweight boys was slightly higher (20.6%) but only 2.7% were obese.

Girls' height is lower than national reference data, but weight and BMI are slightly higher. BMI values are within normal limits for most of the sample, but 23.6% are overweight and 6.9% obese. In the 1997 study, the numbers of overweight (16.3%) and obese (2.8%) students were lower. When compared to 1997 values, the increase in female stature is significantly higher only in the first age class, perhaps due to an earlier growth spurt, whereas weight values are significantly higher in the upper age classes (17-18 y).

In conclusion, there is evidence of increases in overweight and obesity, particularly in the female sample.

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