

Conference Report

Abstracts of the 25th International Colloquium on Animal Cytogenetics and Genomics (25th ICACG), 26–29 June 2024, Naples, Italy

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1. Introduction

The 25th International Colloquium on Animal Cytogenetics and Genomics is dedicated to the memory of Dr. James (Jim) Womack, a pioneer in gene mapping, especially in cattle. The meeting opened with an obituary presented by Prof. Penny Riggs, a former student at Texas A&M University (TAMU) and now a professor in the same department.

The meeting was organized into 10 sessions, beginning with General Opening Session 1, which featured three main lectures highlighting the fields of animal cytogenetics and genomics. As expected, among the 83 accepted abstracts for publication, those related to animal genomics were more prevalent than those focused solely on cytogenetics. However, several abstracts combined the two disciplines (Cytogenomics) to provide a deeper understanding of animal genomes and to better identify latent chromosome abnormalities related to fertility. Various genomic approaches were reported in several abstracts, aimed at improving the selection of animals for productive traits, disease resistance, and animal biodiversity.

Given the numerous abstracts on water buffalo (river type), a specific session was dedicated to this species, which is particularly important in Eastern, South American, and Mediterranean countries. Nonetheless, research on a wide range of animal species, including domestic and non-domestic animals, non-mammalian vertebrates, and invertebrates, was also presented. Special attention was given to the posters, which were displayed throughout the meeting. Additionally, 15 of the posters, selected by the chairpersons of the poster session, are presented and discussed on the final day. Five posters received awards. All abstracts underwent peer review, and only a few required corrections or modifications. In conclusion, the colloquium featured 13 lectures (L), 27 oral communications (O), and 43 posters (P). Each presentation was numbered according to the congress program. Special thanks to the editorial staff of the “Biology and Life Science Forum” journal for their assistance with the abstract’s review and editing.

2. Dr. James (Jim) Womack Obituary

O1—Gene Mapping Is Good for You!—Remembering Dr. James E. Womack

Penny K Riggs and Womack Lab Former Students

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A true pioneer in the field of comparative animal genomics, Prof. Jim Womack (30 March 1941–13 August 2023) is remembered for his remarkable career, scientific achievements, and mentorship of 50 doctoral students and countless additional graduate students, post-doctoral scientists, and visiting scholars. Jim completed a Bachelor of Science degree at



Citation: Iannuzzi, L.; Ciotola, F.; Albarella, S.; Iannuzzi, A.; Perucatti, A.; Peretti, V. Abstracts of the 25th International Colloquium on Animal Cytogenetics and Genomics (25th ICACG), 26–29 June 2024, Naples, Italy. *Biol. Life Sci. Forum* **2024**, *33*, 1. <http://doi.org/10.3390/blsf2024033001>

Academic Editor: Pere Puigbò

Published: 25 June 2024



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10.7. P41—Identification of a Donkey *CSN1S2I* Allele Resulting from a Non-Constitutive Splicing Event

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The α s2-casein is a phosphoprotein secreted in the milk of most mammals, and it is the most hydrophilic of all caseins. Contrary to ruminants, in donkeys, two different encoding genes (*CSN1S2I* and *CSN1S2II*) have been identified. The first, spanning over a cDNA fragment of 1016 nt, is made of 19 exons and encodes for the α s2-I protein of 221 amino acids. Nonetheless, while ruminants have been extensively studied in this regard, detailed characterization of the variability at this *locus* in donkeys has been lacking so far. Therefore, this study aimed to identify and analyze the variability of the *CSN1S2I locus* in Ragusana and Amiatina donkeys reared in Italy. For this purpose, the transcripts and genomic DNAs of eight subjects for each breed were sequenced. The sequence comparison revealed a transition G > A at the splice acceptor site of exon 17 that results in a skipping of the first 15 nt of this exon encoding for the peptide 176NKINQ180 and the recognition of an in-frame cryptic splicing acceptor site: arAACAAAATCAACCAG. The comparison of the sequences available in GeneBank showed that this peptide is constitutively spliced in all species belonging to the *Perissodactyla* order, in contrast to what is observed in species belonging to the *Cetartiodactyla* and *Carnivora* orders. Furthermore, the contemporary presence of the canonical and cryptic acceptor sites of the 17th exon is observed only for species belonging to the sub-order *Ruminantia*. It is interesting to note that the 176NKINQ180 sequence is a perfect duplication of the pentapeptide encoded by the first 15 nucleotides of exon 12 (92NKINQ96), which is a trait of two major IgE-binding epitopes of the bovine α s2-CN. Therefore, the absence of duplication could be related to the demonstrated low allergenic properties of donkey's milk. The transition G > A alters an *Xba*I restriction site. Thus, a PCR-RFLP protocol was set up for the quick genotyping of 105 Ragusana and 14 Amiatina donkeys. Out of the total investigated population, the G allele has a frequency of 0.7563 with no evidence of departure from the Hardy-Weinberg equilibrium. Results indicate that donkeys, similar to buffalo at the same *locus*, have a *CSN1S2I* allele resulting from a non-constitutive splicing event.

10.8. P42—Genomic Investigation on Casertana and Commercial Italian Pig Breeds

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The Casertana pig (C) is a breed native to Southern Italy, prized for its exceptionally fine meat and high nutritional value. Preserving and understanding its genetic makeup is crucial for both production and reproductive purposes. In this preliminary study, we conducted genetic screening on 33 Casertana pigs and 31 hybrid pigs, including Duroc-Large White (DLW), Pietrain-Large White (PLW), Pietrain, and Duroc-Landrace breeds. We employed two genomic approaches: RAPD-PCR (Random Amplification of Polymorphic DNA) and mtDNA (mitochondrial DNA) analysis.