

Genetics of immune response and disease resistance

Organised by a Standing Committee: YES

Meeting information

Date: July 4, 2023
Time: 2-5:30 PM
Number of participants: 68

Chair

Name: Chris Tuggle
Affiliation: Iowa State University
Contact email: cktuggle@iastate.edu

Co-Chair (optional)

Name: Graham Plastow
Affiliation: University of Alberta
Contact email: gplastow@ualberta.ca

Agenda

Genetics of Immune Response and Disease Resistance (orals)	
Chair(s): Christopher Tuggle, Iowa State University Ames, Iowa, United States	
Location: Daisy	
Date & Time: Tuesday, July 4, 2:00 PM - 5:30 PM	
2:00 PM	89939 Invited Workshop Presentation: Uncovering the basis of natural tolerance to African cattle diseases using integrative omics. James Prendergast*, <i>Roslin Institute, University of Edinburgh, Scotland, UK.</i>
2:40 PM	89660 IUIS-VIC Travel Award1: Transcriptomic signatures of peripheral immune cells associated with immune competence traits in Australian Angus cattle. Annaleise Wilson* ¹ , Pamela Alexandre ² , Thibault Legrand ² , Stuart Denman ² , Toni Reverter ² , Cameron Stewart ¹ , and Ryan Farr ¹ , ¹ <i>Commonwealth Scientific and Industrial Research Organization, East Geelong, VIC, Australia,</i> ² <i>Commonwealth Scientific and Industrial Research Organization, St Lucia, QLD, Australia.</i>
2:50 PM	89800 Association of variants in antibacterial TLR genes with reproductive traits in Czech Simmental cattle. Karol Novak* ¹ , K. Samake ² , and M. Bjelka ³ , ¹ <i>Institute of Animal Science, Prague-Uhrineves, Czech Republic,</i> ² <i>Charles University, Prague, Czech Republic,</i> ³ <i>Breeding Company CHD Impuls, Bohdalec, Czech Republic.</i>
2:58 PM	89546 CRISPR-SpRY-mediated base-editing screening identifies TMEM41B amino acids that are critical for Transmissible gastroenteritis virus replication in pig. Yuan Zhou* ¹ , Jinfu Zhang ¹ , Yonghui Zhang ¹ , Xinyun Li ^{1,3} , Shengsong Xie ^{1,2} , Changzhi Zhao ^{1,2} , and Shuhong Zhao ^{1,3} , ¹ <i>Key Laboratory of Agricultural Animal Genetics, Breeding and Reproduction of Ministry of Education & Key Lab of Swine Genetics and Breeding of Ministry of Agriculture and Rural Affairs, Huazhong Agricultural University, Wuhan, Hu Bei, China,</i> ² <i>Hubei Hongshan Laboratory, Frontiers Science Center for Animal Breeding and Sustainable Production, Wuhan, Hu Bei, China,</i> ³ <i>The Cooperative Innovation Center for Sustainable Pig Production, Huazhong Agricultural University, Wuhan, Hu Bei, China.</i>
3:10 PM	89613 Genome-scale CRISPR screen identifies TRIM2 and SLC35A1 associated with Porcine Epidemic Diarrhoea Virus infection. Hailong Liu ¹ , Jieru Wang ² , Zishi Guo ¹ , Xiaoyu Zeng ² , Yuqing Yang ¹ , Sheng Li ¹ , Xinyun Li ^{1,4} , Shuhong Zhao ^{1,3} , Chonglong Wang ² , and Shengsong Xie* ^{1,3} , ¹ <i>Key Laboratory of Agricultural Animal Genetics, Breeding and Reproduction of Ministry of Education & Key Lab of Swine Genetics and Breeding of Ministry of Agriculture and Rural Affairs, Huazhong Agricultural University, Wuhan, Hubei, P. R. China,</i> ² <i>Key Laboratory of Pig</i>

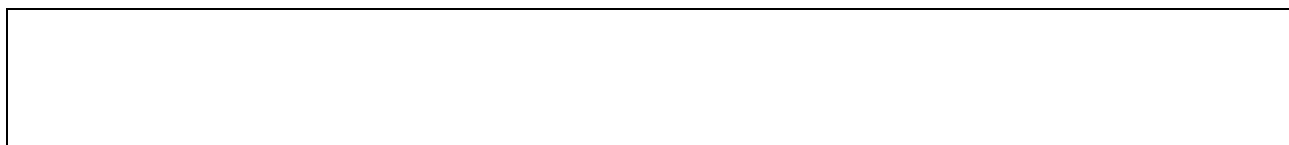
<p><i>Molecular Quantitative Genetics of Anhui Academy of Agricultural Sciences, Livestock and Poultry Epidemic Diseases Research Center of Anhui Province, Anhui Provincial Key Laboratory of Livestock and Poultry Product Safety Engineering, Hefei, Anhui, P. R. China, ³Hubei Hongshan Laboratory, Frontiers Science Center for Animal Breeding and Sustainable Production, Wuhan, Hubei, P. R. China, ⁴The Cooperative Innovation Center for Sustainable Pig Production, Huazhong Agricultural University, Wuhan, Hubei, P. R. China.</i></p>	
3:22 PM 89645	<p>LncRNA446 regulates tight junctions by inhibiting the ubiquitinated degradation of Alix after porcine epidemic diarrhea virus infection. Yeyi Xiao*, Weiyun Qin, Haifei Wang, and Wenbin Bao, <i>Yangzhou University, Yangzhou, Jiangsu, China.</i></p>
3:30 PM	<p>Tea/Coffee Break, Exhibition and Poster Viewing.</p>
4:00 PM 89410	<p>Multi-omics integration analysis deciphering genetic basis of host resistance to PRRSV. Qingqing Wu*¹, Tong Zhang¹, Xianmeng Wu¹, Xiang Zhou^{1,2}, and Bang Liu^{1,2}, <i>¹Key Laboratory of Agricultural Animal Genetics, Breeding and Reproduction of Ministry of Education, College of Animal Science and Technology, Huazhong Agricultural University, Wuhan, China, ²Hubei Hongshan Laboratory, Wuhan, China.</i></p>
4:12 PM 89371	<p>Superior survivability of <i>GBP1</i> and <i>GBP5</i> heterozygous pigs undergoing porcine respiratory syndrome outbreaks. Romi Pena*¹, Kato Keutgens², and Lorenzo Fraile¹, <i>¹Universitat de Lleida-AGROTECNIO Centre, Lleida, Spain, ²PXL University of Applied Sciences and Arts, Hasselt, Belgium.</i></p>
4:20 PM 89690	<p>IUIS-VIC Travel Award2: Due to their improved immunity, disease resistant common carp fish are also less infective. Batyá Dorfman*, Evgeniya Marcos-Hadad, Roni Tadmor-Levi, and Lior David, <i>The Hebrew University of Jerusalem, Dept. of Animal Sciences, R.H. Smith Faculty of Agricultural, Israel.</i></p>
4:30 PM OP100	<p>ISAG Bursary Award: Functional diversity of Toll signaling pathway in Czech Simmental cattle with respect to health and resilience traits. Kalifa Samake*¹, T. Valcikova², M. Bjelka³, and K. Novak⁴, <i>¹Charles University, Prague, Czech Republic, ²Czech University of Life Sciences, Prague, Czech Republic, ³Breeding Company CHD Impuls, Bohdalec, Czech Republic, ⁴Institute of Animal Science, Prague-Uhrineves, Czech Republic.</i></p>
4:42 PM 89478	<p>Genomic Markers Associated with Immune Traits in Sasso Chickens Raised in Ethiopia. Mekonnen Girma*^{1,2}, Morris Katrina³, Sutton Kate³, Wondmeneh Esatu², Bersabhe Solomon², Tadelle Dessie², Psifidi Androniki^{3,4}, Vervelde Lonneke³, Hanotte Olivier^{2,5}, Banos Georgios^{3,6}, and Malatji</p>

Dikeledi¹, ¹*Department of Agriculture and Animal Health, College of Agriculture and Environmental Sciences, University of South Africa, Florida 1710, South Africa,* ²*CTLGH-LiveGene, International Livestock Research Institute (ILRI), P.O. 5689, Addis Ababa, Ethiopia,* ³*Centre for Tropical Livestock Genetics and Health, The Roslin Institute, University of Edinburgh, Easter Bush Campus, Midlothian, EH25 9RG, UK,* ⁴*The Royal Veterinary College, Hawkshead Lane, Hatfield, Hertfordshire, AL9 7TA, UK,* ⁵*Cells, Organisms and Molecular Genetics, School of Life Sciences, University of Nottingham, Nottingham, NG7 2RD, UK,* ⁶*Scotland's Rural College (SRUC), Animal and Veterinary Sciences, Easter Bush, EH25 9RG, Midlothian, UK.*

4:54 PM 89214 **Assessment of haemagglutination titre and serum lysozyme concentration in Nigerian indigenous chicken genotypes.**
U. Akpan*, A.S. Adenaike, M.I. Takeet, A.A. Bello-Ibiyemi, and C.O.N. Ikeobi, *Federal University of Agriculture, Abeokuta, Ogun state, Nigeria.*

5:02 PM 89729 **Exploring, evaluating, and quantifying the mammalian alveolar macrophage response to intracellular mycobacterial pathogens using an integrative multi-omics approach.**
T. J. Hall¹, M. Mittermite², J. A. Browne¹, G. P. McHugo¹, J. F. O'Grady¹, E. L. Clark³, M. Salavati^{3,4}, S. V. Gordon^{2,5}, and David. E. MacHugh*^{1,5}, ¹*UCD School of Agriculture and Food Science, University College Dublin, Belfield, Dublin, D04 VIW8, Ireland,* ²*UCD School of Veterinary Medicine, University College Dublin, Belfield, Dublin, D04 VIW8, Ireland,* ³*The Roslin Institute and Royal (Dick) School of Veterinary Studies, University of Edinburgh, Edinburgh, EH25 9RG, Scotland, United Kingdom,* ⁴*Dairy Research and Innovation Centre, SRUC South and West Faculty, Barony Campus, Parkgate, Dumfries DG1 3NE, Scotland, United Kingdom,* ⁵*UCD Conway Institute of Biomolecular and Biomedical Research, University College Dublin, Belfield, Dublin, D04 VIW8, Ireland.*

5:14 PM **Genetics of Immune Response and Disease Resistance Business Meeting.**



Summary of the meeting

Report on the Genetics of immune response and disease resistance workshop (GIRDRW) at the International Society of animal genetics meeting July 2023

The GIRDRW was held in Capetown July 4, 2023 (room and times are shown in the detailed program). The program was put together by a vote of the current committee (https://www.isag.us/committee_members.asp?comm=IS-GIRC) using those abstracts submitted



INTERNATIONAL SOCIETY FOR ANIMAL GENETICS

which requested to be included in our Workshop. Some balancing was done to have a mix of species represented. Prior to this, the committee had decided to apply for an invited speaker; Romi Pena spearheaded this application and we were successful in obtaining ISAG funding for Dr. James Prendergast (U.K.). Our Committee was also fortunate in that the IUIS-VIC chair Claire Rogel-Gaillard and member Eva Watrang contacted the Co chairs to organize a competition for funding that the IUIS-VIC (\$1,000). This travel funding was intended to be a means for connecting our two committees. Request for applications were sent out and we awarded \$500 each to two strong applicants Batya Dorfman (Israel) and Annaleise Wilson (Australia). With these three speakers we then assigned 40 minutes to Dr. Prendergast and 10 minutes each to the IUIS-VIC awardees; this left two hours for the rest of the workshop. We note also that six speakers won an ISAG bursary award; all these awards are denoted in the program below.

Approximately 65-68 people were in the audience within the first 5 minutes of the start of the Workshop, Two speakers were not able to attend the Workshop due to visa issues but were able to record their talks and these were provided to the Workshop attendees. The Co Chairs thank all speakers for interesting talks and the discipline to stay on time so that all speakers had their full time.

In the business meeting we discussed the current committee and terms for each member to determine elections needed. Those who are fulfilling their second term included the two Co chairs Chris Tuggle and Graham Plastow as well as Karel Novak. Two members that were completing their first term Sabine Hammer and Romi Pena were nominated for reelection and these two were re-elected with no negative votes from those present. The terms for Romi Pena and Sabine Hammer will be until 2027 and they both agreed to serve as Co chairs for the next workshop as well and there was no concerns. Nominations for additional members were then made and Matthew Addelke from UKZN, South Africa was nominated and elected. Therefore the committee for 2023 to 2025 is as follows:

Co-Chairs:

1. Romi Pena, University of Lleida, Lleida, Spain, Term of service (2nd term, 2023-2027)
2. Sabine Hammer, University of Veterinary Medicine Vienna, Austria (2nd, 2023-2027)

Members:

3. Kathryn McRae, AgResearch, Mosgiel, New Zealand, (1st, 2021-2025)
4. Eduard Murani, Institute for Farm Animal Biology FBN Dummerstorf, Dummerstorf, Germany, (1st, 2021-2025)
5. Marta Alonso-Hearn, NEIKER-Basque Research and Technology Alliance (BRTA), Derio, Bizkaia, Spain, (1st, 2021-2025)
6. Tavsief Ahmad, Division of Animal Genetics & Breeding, FVSc & AH, SKUAST- Kashmir India, Srinagar, India (1st, 2021-2025)
7. Matthew Addelke, University of KwaZulu-Natal, Durban, South Africa (1st, 2023-2027)

General discussion

The structure of the workshop as a series of talks was discussed. Overall the group liked to hear from many different project teams and so the general structure was acceptable for 2025. But many members also wanted to reserve more time for unstructured interactions and development



INTERNATIONAL SOCIETY FOR ANIMAL GENETICS

of collaborative approaches. One interesting suggestion was that a part of the workshop could be to adjourn to the posters which in 2023 were organized by workshop so this was a very possible mechanism for interactions if the same organization holds for 2025. Another suggestion was to set up a topic for discussion, and potentially a speaker related to that topic, i.e., “experimental design for collaborative disease challenges”. The new committee will consider these options in developing the 2025 workshop.

New Committee chair

Chair: Romi Pena, University of Lleida, Lleida, Spain,
Term of service (<i>add years of first and second term of service</i>): (2 nd term, 2023-2027)
Affiliation: University of Lleida, Lleida, Spain,
E-mail address: romi.pena@udl.cat

New Committee co-chair (optional)

Chair: Sabine Hammer
Term of service (<i>add years of first and second term of service</i>): (2 nd , 2023-2027)
Affiliation: University of Veterinary Medicine Vienna, Austria
E-mail address: sabine.hammer@phylo-dat.net

Note: One term runs for two bi-annual conferences (i.e. four years)

New Committee members

Other committee members	First term of service (from year to year)	Second term of service (from year to year)	Email address
3. Kathryn McRae, AgResearch, Mosgiel, New Zealand,	(1st, 2021-2025)		Kathryn.McRae@agresearch.co.nz
4. Eduard Murani, Institute for Farm Animal Biology FBN Dummerstorf,	(1st, 2021-2025)		murani@fbn-dummerstorf.de

<p>Dummerstorf, Germany, 5. Marta Alonso- Hearn, NEIKER- Basque Research and Technology Alliance (BRTA), Derio, Bizkaia, Spain,</p>	<p>(1st, 2021- 2025)</p>		<p>malonso@neiker.eus</p>
<p>6. Tavsief Ahmad, Division of Animal Genetics & Breeding, FVSc & AH, SKUAST- Kashmir India, Srinagar, India</p>	<p>(1st, 2021- 2025)</p>		<p>tavsief@gmail.com</p>
<p>7. Matthew Addelke, University of KwaZulu-Natal, Durban, South Africa</p>	<p>(1st, 2023- 2027)</p>		<p>AdelekeM@ukzn.ac.za</p>

COMPARISON TEST (2020-2021)

NO

SIGNATURE



Chair

Duty laboratory (if applicable)