

Mining genomes of African and Portuguese local breeds to study host/pathogen adaptation

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This work explores the genetic and molecular mechanisms underlying host–pathogen adaptation and environmental resilience in African and Portuguese livestock, with emphasis on sheep and pig populations. In Portuguese Merino sheep, genome-wide analyses were conducted to identify genetic determinants of resistance to coccidial infection, a disease that causes significant production losses in young lambs. Genotyping of nearly 400 lambs using high-density SNP arrays identified 19 significant variants, including loci within genes associated with protease inhibition pathways. Functional enrichment indicated that peptidase inhibitors and regulators play a key role in limiting *Eimeria* sporozoite invasion, suggesting natural selection has increased tolerance-associated genotypes in this breed. Complementary analyses of livestock across diverse Angolan biomes examined genetic diversity, relatedness, selective sweeps, and epigenetic differentiation to identify mutations linked to environmental adaptation. Whole-genome sequencing of Angolan pigs revealed high genetic diversity and signatures of selection associated with metabolism, tissue remodeling, and feed efficiency, while comparative analyses indicated close ancestry between Angolan, Landim, and Iberian pigs. Additional evidence suggests selective pressure on loci involved in neural circuitry and the neuroimmune axis, potentially enhancing survival behaviors and innate immune responses. Together, these findings demonstrate how genomic variation, natural selection, and ecological pressures shape disease resistance and adaptive traits in locally adapted breeds, providing insights to support sustainable breeding strategies and resilience to pathogens and environmental stressors.

Event: ABG Connection days, 17-18 Outubro, Países Baixos

ABG Connection Days 2024

"Connect & Reconnect"



Register

The aim of the ABG Connection Days is to share knowledge, to connect and reconnect and share experience with alumni and colleagues. Therefore, the main theme of the ABG Connection Days 2024 is "Connect & Reconnect" and each day will have a specific sub-theme.

The theme of the first day is 'Animals of the Future', with a focus on Artificial Intelligence (AI), Biodiversity and Climate Change. The theme of the second day is 'Breeding all over the world', and this day will focus on the role of different ABG alumni working all over the world.

Programme

Thursday 17 October

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| 13.00-14.00 | Walk-in with lunch buffet |
| 14.00-14.30 | Welcome and getting to know each other by Esther Ellen |
| 14.30-15.20 | Artificial Intelligence in animal breeding: introduction by Claudia Kamphuis
Presentations* by Marjaneh Taghavi, Torsten Pook, Henk Bovenhuis, Yuuko Xue
John Bastiaansen |
| 15.20-15.35 | Discussion |
| 15.35-16.00 | Break |
| 16.00-17.45 | Biodiversity and climate change: introduction by Sipke Joost Hiemstra
Presentations by Richard Crooijmans, Mira Schoon, Rensco Hogers, Marije Steensma, Gibbs Kuguru, Malou van der Sluis, Jeremie Vandeplas, Anouk van Breukelen |
| 17.45-18.00 | Discussion |

18.00-18.30 End official programme day 1

19.00 Dinner

* For more detailed information see tab 'Speakers and Topics'

Friday 18 October

08.00-09.00 Breakfast

09.00-09.15 Start official programme day 2 and welcome by Mario Calus

09.15-10.45 ABG alumni working all over the world

Presentations* by Tessa Tichelaar-Brinker, Hamed Rashidi, Benan Gulzari (Rijk Zwaan), Maria Siwek-Gapńska (Bydgoszcz University of Science and Technology), Naomi Duivensteijn (Hendrix Genetics), Biaty Raymond (Limagrain), Andreia de Jesus Amaral (University of Évora), Jaap Veldhuisen (CRV), Siyuan Xing (MolBreeding Biotechnology Co., Ltd), Nonja Remijn (SZH - Stichting Zeldzame Huisdierrassen)

10.45-11.15 Break

11.15-12.15 Round table discussions on societal acceptance of animal breeding, the breeding sector and education, plant and animal breeding

12.15-12.45 Summary and discussion

12.45-14.00 Lunch

14.00 End official programme day 2

* For more detailed information see tab 'Speakers and Topics'

Call for speakers: share your expertise

It's still possible to contribute by giving a short pitch on a topic related to one of the themes that you are skilled at and passionate about. If you would like to contribute, please send an email to office.abg@wur.nl and make sure to include the title of your pitch.

Programme updates

We will keep you up to date on the programme through our programme page:

https://event.wur.nl/abgconnectiondays_2024/wiki/1099015/programme. You can also follow our [LinkedIn-page](#) for regular updates about the programme and the speakers.

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Thursday 17 October

14.30-15.20	Artificial Intelligence in animal breeding	Claudia Kamphuis
	Deep learning – an alternative for genomic prediction?	Torsten Pook
	Fish phenotyping	Yuuko Xue and John Bastiaansen
	Keeping an Eye on Locomotion and Behavior using Computer Vision	Marjaneh Taghavi
	The implications of AI for education and science	Henk Bovenhuis

16.00-17.45	Biodiversity and climate change	Sipke-Joost Hiemstra
	Using behavior as potential indicator for heat stress and breeding for improved heat tolerance in chickens	Malou van der Sluis
	Evaluating the effects of heat stress on Dutch dairy cattle	Jeremie Vanderplas
	Reducing methane emissions of dairy cows by breeding	Anouk van Breukelen
	How to disentangle adaption of traditional cattle breeds in the world using molecular tools	Richard Crooijmans
	Sharks and Breeding? Applying Techniques from ABG for Wildlife Conservation	Gibbs Kuguru
	Sustainable horse breeding	Marije Steensma
	CGN genebank for diversity	Mira Schoon en Rensco Hogers

Friday 18 October

09.15-10.45	ABG alumni working all over the world	
	Breeding Vegetables Beyond Borders	Tessa Tichelaar-Brinker, Benan Gulzari (Rijk Zwaan)
	Egg came first! Take care of the egg! How do we do this at PBS - Poland?	Maria Siwek-Gapínska (Bydgoszcz University of Science and Technology)
	Plant Breeding at Limagrain: Then, Now & the Future	Biaty Raymond (Limagrain)
	Breeding dual-purpose chickens for African environments	Naomi Duivensteijn (Hendrix Genetics)
	Mining genomes of African and Portuguese local breeds to study host/pathogen adaption	Andreia de Jesus Amaral (University of Évora)
	Better cows, Better life, around the world	Jaap Veldhuisen (CRV)
	A new genotyping method in animals breeding: Genotyping by targeted sequencing	Siyuan Xing (MolBreeding Biotechnology Co., Ltd)
	it's all about the people	Nonja Remijn (SZH - Stichting Zeldzame Huisdierrassen)

