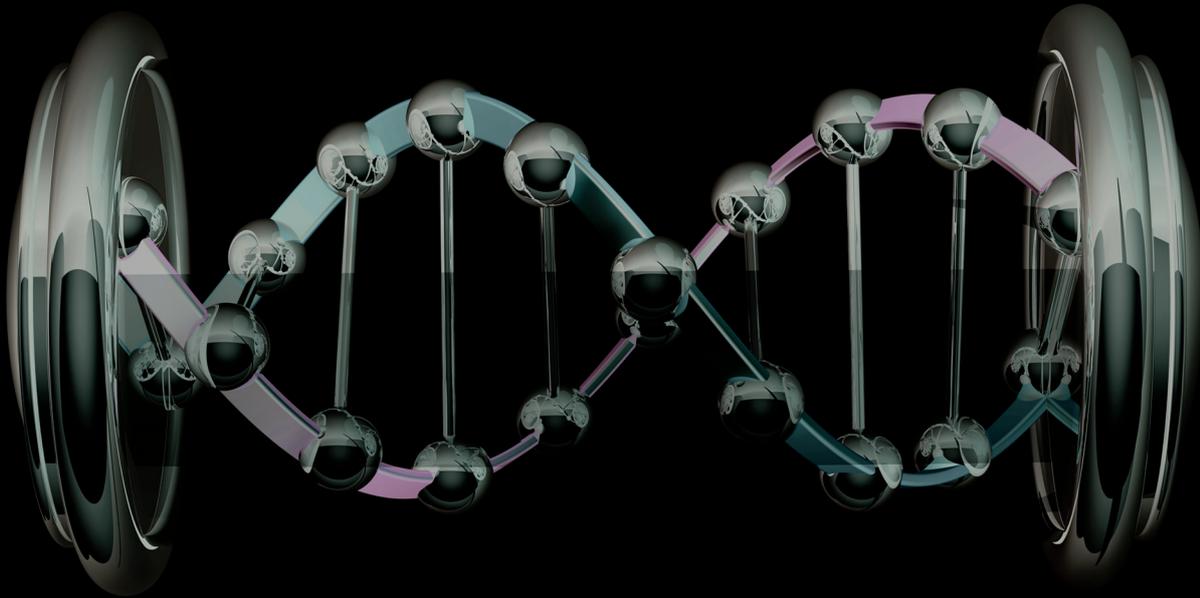


UK benefits from EC-funded genetics and genomics research



The Biosciences KTN instigated and coordinated “SABRE”, a large pan-European project, thereby ensuring a large UK involvement. Those involved now use new genomic knowledge in commercial products that have global impact on food security and sustainability.

The need

The efficiency and sustainability of food production is improved year on year by the world's plant and animal breeders. As these benefits from selective breeding are cumulative, even small increases to the rate of annual improvement can have very large impacts over time. The application of new genomic technologies can increase the rate of genetic improvement by up to 50 percent, particularly for some traits. However, early development costs can be high as the process is very knowledge and data intensive. Developing effective international collaborations plays an important role in making good progress affordable.

The results

Participation in the European Commission's Framework Programmes provides opportunities for UK based organisations to collaborate with many of the world's leading genetics organisations. The funding mechanism also enables leveraging of research funding by project partners and national funders.

Led by the Biosciences KTN, SABRE (Cutting-Edge Genomics for Sustainable Animal Breeding) was made possible by a €13.9 million grant from the EC's 6th Framework Programme. With 36 partners and a total project value of €23 million, SABRE is one of the largest food-related EC projects to date, and has resulted in numerous benefits to European and UK organisations. The €7.1 million worth of activities carried out by the 11 UK project partners comprised of €2.6 million UK investment and €4.5 million EC grant.

SABRE has provided both fundamental knowledge of genomics and epigenetics

related to animal health, food safety and food quality traits in many livestock species, along with the selection tools required to implement this knowledge in breeding programmes. The knowledge gained has allowed animal breeders to increase the emphasis given to animal health, welfare, food safety, product quality and ultimately sustainability within ongoing breeding programmes.

While of great scientific and economic benefit to project partners, the SABRE project also enabled many partners to forge effective linkages that will continue beyond SABRE's lifespan; The project has also helped Biosciences KTN become a major international hub in knowledge transfer for animal genomics. This provides the UK industry with a greatly enhanced network of leading science groups, which has strongly contributed to the Biosciences KTN's success in gaining EU funding for two further genomics projects that they coordinate:

3SR (www.3SRbreeding.eu)

Quantomics (www.Quantomics.eu).

Examples of SABRE results

Poultry and Food Safety



The 370 million laying hens in the EU produce 9.9 million tonnes of eggs each year. Poor eggshell quality can lead to substantial levels of waste through cracked or damaged eggs as well as early culling of hens. Cracked eggs are also more susceptible to bacterial infections that can cause Salmonella outbreaks. Through the SABRE project a number of tests have been developed

which will help breeders to select hens that lay eggs with stronger shells that are less likely to crack. If this could result in even a 10% (or 14,000) reduction in human Salmonella infection cases across the EU, annual cost savings of about €400million could be achieved.

Pigs and Animal Welfare



Boar taint is an unpleasant odour and taste that affects meat from around 5-15% of uncastrated male pigs. To avoid the problem, approximately 90 million male piglets are castrated shortly after birth in the EU every year. However, the EC and many stake holders in the pig industry are seeking to end castration in Europe by 2018 with the aim of improving pig welfare. SABRE research has contributed to the development of a genetic test for boar taint, which makes selective

breeding a realistic alternative to castration, without reducing meat quality.

Cattle and Disease Resistance



Mastitis is a painful inflammatory reaction in the mammary gland due to invasion and colonisation by diverse pathogens. Mastitis is also one of the main reasons for antibiotic use in dairy production as it affects 6.9 million dairy cattle in Europe at an annual cost of €2 billion. Through the SABRE project genes and genetic pathways involved in the immune

response to bovine mastitis have been identified. This information can now be used to help breeders identify and select for cows that are more resistant to mastitis, thus simultaneously improving animal welfare, food safety, product quality, economic returns and reducing the need for antibiotic use.

Economic Value of Animal Genomics

The economic value per annum of animal production at farm level is €132 billion (2004) in the European Union-25 and £9.8 billion (2010) in the UK. Conservative estimates of the economic gain achieved each year by animal breeding are €1.83 billion in Europe and £137 million in the UK. The value of genomic technologies to the UK animal industry is estimated to be at least £20 million per annum.



SABRE

CUTTING EDGE GENOMICS FOR SUSTAINABLE
ANIMAL BREEDING

“SABRE has provided opportunities to select high performing animals that adapt better to environmental challenges.”

Genus plc

Project Details

Duration:

April 2006-September 2010

Commercial UK Partners:

1. Biosciences KTN
2. Argentix Ltd
3. Genus plc
4. Cogent Ltd
5. BioBest Ltd
6. Aviagen Ltd

Academic UK Partners:

7. Wellcome Trust Sanger Institute
8. The Roslin Institute and R(D)SVS, University of Edinburgh
9. Scottish Agricultural College
10. Institute for Animal Health
11. University of Glasgow

Project investment:

EC: €13.9 million

Total: €23 million

Contact:

Biosciences KTN: 0131 651 7334

info@biosciencektn.com



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You can find SABRE on _connect: <https://ktn.innovateuk.org/web/international-projects/sabre>

For more information please visit: www.sabre-eu.eu



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