



Biodiversity Genomics Europe: Europe's drive to reverse biodiversity loss through genomics research

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European experts gather to launch an unprecedented project that will tackle the biodiversity crisis using DNA data.



BGE brings together experts from more than 20 countries. *Photo: Royal Botanic Garden Edinburgh*

The comprehensive application of genomic science to biodiversity research will fundamentally change conservation science and policy - with impacts predicted to be on a scale similar to those of the Human Genome Project in medicine. The new pan-European Biodiversity Genomics Europe (BGE) consortium, launched today, is leading the way.

Time is running out. An appalling one in four species on the planet are currently threatened with extinction, putting livelihoods, food supplies, and essential water and nutrient cycles at risk. Knowledge is of the essence in the fight to reverse this unprecedented loss of species and degradation of ecosystems - yet currently our understanding of how life on Earth functions and responds to environmental pressures is far from complete. Genomics provides crucial new tools to

answer these questions, and the BGE consortium will cause a quantum leap in the use of genomics across the continent.

Despite centuries of scientific research, an estimated 80% of the world's species still await scientific discovery and description. Even for described species, telling them apart is often difficult. Moreover, interactions within and among species, and between species and their environment, create a hugely complex picture from individual to planetary levels. Genomic science is our best hope for success in mapping these interdependencies and predicting how individuals and groups may respond to environmental change.

By bringing together Europe's key practitioners in two fundamental DNA-based technologies - DNA barcoding and genome sequencing - BGE will streamline the rollout of these methods across Europe.

DNA barcoding uses short sequences of DNA to discriminate between species - analogous to the way conventional barcodes distinguish products in a supermarket. With modern genetic sequencing techniques, DNA barcoding has the potential to dramatically accelerate the inventory of life on Earth, providing a basis for global conservation monitoring.

At the opposite end of the scale, **genome sequencing** determines the order of DNA nucleotides - the building blocks of the genetic code - throughout the entire genome of any given species. This enables scientists to identify and locate genes and other features of the genome, creating a comparative 'map' of the code that creates each organism. This provides a full picture of how biological systems function and, crucially, how species respond and adapt to environmental change.

Europe at the forefront of genomics research

The EU's Biodiversity Strategy for 2030 and the European Green Deal make clear commitments to address challenges such as pollinator decline, the deterioration of key terrestrial, freshwater and marine habitats, and the impact of invasive non-native species on biodiversity. The Horizon Europe-funded BGE Consortium - a major investment in European genomic science - provides the means to achieve these aims.

BGE's project director, **Dimitris Koureas** (Naturalis Biodiversity Center, The Netherlands) said *"We see BGE as a mechanism through which we can go out from the limitations of national investments that we already have in biodiversity genomics and into the European level. We are looking at BGE as a mechanism to build the economies of scope and scale that we need for the future."*

Pete Hollingsworth, Director of Science at the Royal Botanic Garden Edinburgh, said *"This vital European coalition brings together diverse expertise and infrastructure across two emerging technological streams using the power of DNA and genomic science to help understand and conserve biodiversity, providing the means to tackle some of the biggest challenges facing the planet today."*

Camila Mazzoni, research group leader at the Leibniz Institute for Zoo and Wildlife Research, said *"BGE bridges the identification and monitoring of coexisting species via barcoding and the understanding of the entire genetic make-up and adaptive capacity of each species via genomes. The steady buildup and connection of both types of information will bring an unprecedented comprehension of Earth's biodiversity and the human actions towards its restoration"*.

BGE will also collaborate with the Earth BioGenome Project and International Barcode of Life.

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For further information or interviews please contact info@biodiversitygenomics.eu. A selection of images and graphics can be downloaded from [this link](#).

EDITORS' NOTES

The €21 million **Biodiversity Genomics Europe** (BGE) Project (biodiversitygenomics.eu) is co-funded by the European Commission, as well as the UK and Swiss governments. This first large European project will run until 2026. It brings together organisations from the BIOSCAN Europe DNA-barcoding consortium (104 partner institutions across 29 countries) and the ERGA genome-sequencing consortium (709 members across 37 countries).

BIOSCAN Europe brings together existing European national networks, scientists and projects that work on the monitoring of biodiversity using DNA to build an efficient European system of interconnected facilities for rapid identification and monitoring of species. The initiative is part of the International Barcode of Life Consortium (iBOL) and its global BIOSCAN initiative, which aims to transform understanding of species diversity, their interactions, and dynamics. BIOSCAN Europe's aim is to establish a European hub for the International Barcode of Life consortium.

The **European Reference Genome Atlas (ERGA)** initiative is a pan-European scientific community of experts in genome sequencing that aims to coordinate the generation of reference-quality genomes for all eukaryotic European species. ERGA follows a distributed model to create and consolidate a collaborative and interdisciplinary network of scientists across Europe and associated countries. ERGA works to develop and propagate guidelines for scaling up all the steps required for state-of-the-art reference genome generation through training and knowledge transfer.

Visit www.bioscaneurope.org and www.erga-biodiversity.eu for more details on the individual members of both networks.

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