

Genetic code of 66,000 UK species to be sequenced

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Genetic code of 66,000 UK species are set to be sequenced by the newly launched Darwin Tree of Life Project

The genetic codes of 66,000 species in the UK are planned to be sequenced by the Wellcome Sanger Institute and its collaborators as part of a global effort to sequence the genomes of all 1.5 million known species of animals, plants, protozoa and fungi on Earth.

The UK effort, known as the Darwin Tree of Life Project, officially launches today in London (1 November) alongside the global effort, the Earth BioGenome Project (EBP). The launch is marked by a gathering of key scientific partners and funders from around the globe to discuss progress in organising and funding the project.

The EBP will ultimately create a new foundation for biology to drive solutions for preserving biodiversity and sustaining human societies.

A greater understanding of Earth's biodiversity and the responsible stewarding of its resources are among the most crucial scientific and social challenges of the new millennium. The overcoming of these challenges requires new scientific knowledge of evolution and interactions among millions of the planet's organisms.

The Sanger Institute will serve as the genomics hub in the UK and will collaborate with the Natural History Museum in London, Royal Botanic Gardens, Kew, Earlham Institute, Edinburgh Genomics, University of Edinburgh, EMBL-EBI and others in sample collection, DNA sequencing, assembling and annotating genomes and storing the data. Further, the Sanger Institute will coordinate with other groups contributing to the EBP, such as the G10K Vertebrate Genomes Project (VGP) and the 10,000 Genomes Plant Project, to ensure there is no redundancy of effort, and that each project contributes to the other.

The Darwin Tree of Life project is estimated to cost approximately £100 million over the first five years, and the sequencing of 66,000 species' genomes will take around 10 years.

To mark the 25th anniversary of the Wellcome Sanger Institute, the [institute](#) and its collaborators used PacBio long-read technology and protocols developed by the VGP to sequence the genomes of 25 UK species for the first time, including red and grey squirrels, the European

robin, Fen raft spider and blackberry. The insights gained from the 25 Genomes Project form a basis for scaling up to sequence the genomes of 66,000 species.

The Darwin Tree of Life [project](#) is now possible due to recent and expected advances in sequencing and information technology that will enable the reading and interpretation of thousands of species' genomes each year by the Sanger Institute and its partner institutions across the UK and internationally. All of the data will be stored in public domain databases and made freely available for research use.

Sequencing the eukaryotic species in the UK and worldwide will revolutionise our understanding of biology and evolution, bolster efforts to conserve, help protect and restore biodiversity, and in return create new benefits for society and human welfare.

"Globally, more than half of the vertebrate population has been lost in the past 40 years, and 23,000 species face the threat of extinction in the near future. Using the biological insights we will get from the genomes of all eukaryotic species, we can look to our responsibilities as custodians of life on this planet, tending life on Earth in a more informed manner using those genomes, at a time when nature is under considerable pressure, not least from us," says Professor Sir Mike Stratton, Director of the Wellcome Sanger Institute.

"The Darwin Tree of Life Project is a tremendously important advance for the Earth BioGenome Project and will serve as a model for other parallel national efforts. The Wellcome Sanger Institute brings decades of experience in [genome](#) sequencing and biology to help build the global capacity necessary to produce high quality genomes at scale. The Earth BioGenome Project and its partner organizations welcome the outstanding leadership that the Wellcome Sanger Institute brings to our efforts to sequence all known eukaryotic life on our planet," says

Professor Harris Lewin, University of California, Davis, United States and Chair of the Earth BioGenome Project.

"When the Human Genome Project began 25 years ago, we could not imagine how the DNA sequence produced back then would transform research into human health and disease today. Embarking on a mission to sequence all life on Earth is no different. From nature we shall gain insights into how to develop new treatments for infectious diseases, identify drugs to slow ageing, generate new approaches to feeding the world or create new bio materials," says Sir Jim Smith, Director of Science at Wellcome.

Provided by Wellcome Trust Sanger Institute

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