

The [Human Genome Project](#), which involved preparing a blueprint of the sequence of genes that make up humans, opened a new vantage point to appraise our species. It gave scientists a way to link networks of genes with disease and well-being, as well as discover unexpected links; for instance, why some women were prone to breast cancer more than others. Sequencing the human genome may have been the most high-profile activity of its kind, catalysing new academic disciplines, industrial applications and medical innovations. If mining a single species' genes can yield such benefits — at least \$1 trillion to the U.S. alone, according to a 2013 *Nature* study — the bounty from preparing detailed sequences of every species on the earth could be many multiples of that and could benefit the world and not just the U.S. alone, says a paper published online in the *Proceedings of the National Academy of Sciences*.

The Earth BioGenome Project (EBP), as envisaged in the paper titled “Earth BioGenome Project: Sequencing life for the future of life”, proposes a detailed genome-sequence draft of every eukaryote species (organisms with a defined nucleus and to which belong all plants and animals). There are about eight million eukaryotic species and the authors argue that being able to create their detailed genetic sequences will reveal unexpected, evolutionary connections among the genus, orders and families that make up the so-called Tree of Life. So far, less than 0.2% of eukaryote genomes have been sequenced and these are at the level of “draft genomes”, meaning that they are still at the crudest resolution.

The EBP has a 10-year road map and hopes to sequence about 1.5 million eukaryote species in three phases. This exercise needs global collaboration and can have many benefits. For instance, the Large Hadron Collider at CERN has not only helped Indian physicists but also given a boost to Indian industries, in that they have designed specialised equipment for the machine. The EBP will have similar spin-off benefits, the authors say. Sequencing such a large number of organisms will require innovative computation- and-storage solutions and the programming acumen of many thousands across the world. “The greatest legacy of the EBP will be the gift of knowledge — a complete Digital Library of Life that contains the collective biological intelligence of 3.5 billion years of evolutionary history,” the authors conclude.

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