



## News Release

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### Prof receives \$3 million grant for DNA barcoding centre

A University of Guelph zoology professor has received \$3 million from the Gordon and Betty Moore Foundation to help equip, staff and operate the world's first centre for high-volume DNA barcoding.

The grant to Prof. Paul Hebert is one of the largest research awards a single U of G faculty member has received from a non-government agency. Allocated over three years, the money will help to support barcode studies at the Biodiversity Institute of Ontario, which is being built on the west side of the Guelph campus.

"We are building the first-ever production line for DNA barcoding, and the Gordon and Betty Moore Foundation award has played a critical role in making this possible," Hebert said. "The Foundation was willing to take a risk in aiding a new science idea. Their support is allowing us to rush the acquisition of DNA barcodes, not just here in Canada, but across the planet."

Hebert was the first scientist to propose that a short DNA sequence from a gene found in all animals can be used to identify species. He called it "DNA barcoding" to reflect the fact that analysis focuses on a short, standard gene region. Just as retail barcodes allow the quick identification of millions of items on store shelves, so too will DNA barcodes allow the rapid identification of species, Hebert said.

Already, DNA barcoding has led to the discovery of new species of birds, butterflies and fishes. Hebert estimates that in about 20 years, the technique could enable completion of a catalogue of the estimated 10 million species of animals on the planet, of which only 1.2 million have been formally identified over the past 250 years.

"We are building a master key to life that will represent a major advance in accessibility to biological identifications," he said.

The new Biodiversity Institute of Ontario, which Hebert will direct, will bring together researchers interested in DNA barcoding and will provide the facilities and equipment needed to conduct analysis on species from around the world. The facility has also received support from the Canada Foundation for Innovation, the Ontario Innovation Trust, and the Natural Sciences and Engineering Research Council.

"The Biodiversity Institute of Ontario is capturing the excitement of rediscovering the natural world," said Alan Wildeman, vice-president (research). "The support from the Gordon and Betty Moore Foundation, and indeed all of the organizations supporting this institute, will help fuel that excitement worldwide."

DNA barcoding is already being used by scientists around the world. This month, a renowned fish researcher from Australia came to Guelph, bringing with him 1,000 tissue samples that included representatives of one per cent of all fish species on the planet.

"Fishes are a big challenge for identification because they are the most diverse group of vertebrates," said Hebert. "However, in just 10 days, we assembled DNA barcodes for this subset of fishes, and, in the process, identified several new species."

In addition, Hebert and researchers from the Rockefeller University and the Canadian Wildlife Service recently found four new species of

North American birds. In another discovery, Hebert and leading biodiversity researchers based in Costa Rica and at the Smithsonian Institution used DNA barcoding to show that a tropical skipper butterfly was actually a complex of at least 10 species.

Hebert and other scientists have already begun to establish a public on-line database that includes DNA barcode sequences of known and newly discovered plant and animal species. In the longer term, they expect that inexpensive hand-held devices will allow lay users to do DNA analysis. "Even kids could use this device to input a specimen, gain a DNA sequence and identify anything they encounter," he said.

DNA barcoding has several advantages over traditional identification methods, Hebert said. It requires only a small sample of tissue and it allows the identification of organisms at different stages of their life, such as the eggs and larvae of insects. It can also help resolve identification when only remnants or fragments are available.

"But it's more than an identification system. It also provides a sense of species age, enabling enquiries into the ecological traits that influence the lifespan of a species. It will also be a grand tool for any area of biology that requires species identifications," Hebert said.

The Gordon and Betty Moore Foundation was established in September 2000 by Intel co-founder Gordon Moore and his wife, Betty. The foundation funds outcome-based projects that will measurably improve the quality of life by creating positive outcomes for future generations. Grants are targeted at initiatives that support the foundation's principal areas of concern: environmental conservation, science, higher education and the San Francisco Bay area.

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