



BIOSCAN: Transforming Biodiversity Science

An Exceptional Opportunity for Early Career Researchers

The **International Barcode of Life Consortium (iBOL)** is coordinating a series of research programs that will register all multicellular species and activate a global biosurveillance system within 25 years. **BIOSCAN**, its current program, is an 8-year, \$180 million effort involving organizations in 40 nations. Its scientific work focuses on three major themes – species discovery, interactions, and dynamics. This work will be advanced by exploiting the latest developments in DNA sequencing, AI, data science, and machine learning. This scientific work will support important applications designed to improve the sustainability of agriculture, forestry, and mining. Furthermore, BIOSCAN aims to ensure its science influences society through policy change. Further details are available at <https://bioscan.life/>

Because BIOSCAN's activities are rapidly expanding in Canada and internationally, this is the perfect time to join an enterprise that will transform our understanding of biodiversity and our capacity to manage it. We seek early career researchers (ECRs) to join us in leading Canada's contribution to BIOSCAN.

If selected, you will work with leading Canadian researchers in biodiversity science, genomics, and computer science to achieve BIOSCAN's mission. There will be strong opportunities for cross-disciplinary training, for national and international travel, and for carrying out impactful science.

See following page for a detailed description of each position.

To apply: Candidates should submit a 2-page letter of interest (outlining key skills and background), a full CV, and contact information for two references as one PDF to: BIOSCANCanada@ibol.org. Applicants should clearly indicate the position(s) that are of most interest.

BIOSCAN supports a culture of inclusion as an organizational imperative. As a result, we encourage applications from all qualified individuals, especially those from groups traditionally underrepresented in science.

Closing date: Review of applications will commence on March 21, 2022.



Postdoctoral fellow, Hebert Lab (6 positions)

Principal Investigator: Dr. Paul Hebert

Summary: These postdoctoral fellows will advance work on species discovery in both Canada and internationally. As more than 10 million specimens will be analyzed over the next six years, those selected for these positions will have access to unprecedented datasets in terms of both geographic breadth and taxonomic coverage. Work will involve the acquisition and analysis of long-read DNA sequences generated by in-house PacBio Sequel and Sequel II platforms supported by a strong team of analysts. Tens of thousands of species new to science will be registered, motivating the search for improved methods to discriminate species and to speed their description. Prior experience with arthropod taxonomy, especially with Acarina, Collembola, Hemiptera, Hymenoptera, or Lepidoptera is desirable. Candidates who couple such expertise with a background in DNA barcoding, metabarcoding, or molecular evolution will be ideal for these positions.

Postdoctoral fellow, Hajibabaei Lab (1 position)

Principal Investigator: Dr. Mehrdad Hajibabaei

Summary: Our lab uses genomic methods to investigate biodiversity and its changes at various levels of organization and scales. This postdoctoral position will help advance the development of bioinformatic tools for the rapidly advancing field that uses metabarcoding and related approaches. This could involve the development of new tools or improvement of existing tools to be more scalable or user-friendly. Potential candidates should be comfortable working in a command-line Linux environment, and they should be familiar with a scripting language such as Python or Perl. Candidates should have experience in R and be comfortable performing basic statistical tests in R or Python as required. An interest in or experience implementing machine learning (ML) techniques using R or Python would be an asset but not required. Any previous experience with field work, molecular biology work, analyzing metabarcoding or other genomics data should be mentioned in your application. Our lab provides an excellent training environment for motivated candidates with a willingness to learn or further develop proficiency with scripting/coding/ML methods. Our team has expertise in ecology-evolutionary biology, bioinformatics, and computational biology. Your application should list your technical skills (platforms, languages, programs) and highlight relevant course work as well as how you have applied your technical expertise to address problems in the fields of ecology/evolutionary biology/genomics or related fields.

Postdoctoral fellow, Machine Learning Research Group (1 position)

Principal Investigator: Dr. Graham Taylor

Summary: We seek a postdoctoral fellow to be based in the Machine Learning Research Group at the University of Guelph and affiliated with the Vector Institute for Artificial Intelligence, a network of more than 600 AI researchers. You are motivated to advance AI/ML research in the service of BIOSCAN's ambitious global mission. You will have the opportunity to work on projects that span computer vision and DNA sequence analysis. For vision, this involves pushing the limits of fine-grained recognition for taxonomic categorization using techniques such as self-supervised learning, generative models and sim2real. For DNA sequences, this involves graph representation learning to predict missing links and evolutionary paths from recovered structures. The data collected in BIOSCAN will also support learning joint visual-DNA representations. You have a strong publication record, preferably in international conferences such as NeurIPS, ICML, ICLR and CVPR. You are keen to raise awareness of biodiversity research in those communities. You have mastered Python-based frameworks such as PyTorch/TensorFlow/JAX. You also have experience managing experimental workflows on GPU-enabled clusters. You are open to and ideally experienced in cross-disciplinary collaboration.