PING LIANG

NSERC DISCOVERY GRANT RECIPIENT - 2017 COMPETITION

"Roles of DNA mobile elements in primate genomes"

associate professor
BIOLOGICAL SCIENCES

Tier 2
CANADA RESEARCH CHAIR
genomics & bioinformatics

How would you describe your research?

The study of the mechanisms that lead to genetic variations within and between species and how these genetic variations contribute to the diversity of biological traits, using human and other primates as models with an integrated research approach combining the use of computational and experimental genomics technologies.

What is the overall importance of this project?

This project looks into the contribution of mobile DNA elements in the evolution of primates.

What is/ will be the impact of your research?

Lay the knowledge foundation of personal genomics, which is a key for personalized/precision medicine.

How would you describe the creativity and innovation in the heart of your research?

The study of DNA mobile element's function in the genomes of primates - including our own species - is an important genetic topic, which has not received enough attention.
Our research combines the methodologies of computational genomics and bioinformatics, as well as molecular biology wet lab methodologies. It also provides students with a unique training in genomics and bioinformatics, which is in high demand in the job market.

What does receiving this grant mean to you?

It provides me the funding to do the research and train students. It also represents a recognition for the importance of our research.

What made you decide to enter this field of research?

Bioinformatics combines my research interest in biology and my skills in computer science.

What aspects of your work/research are you most passionate about?

Collaboration and getting biological research done on computers. Addressing some of the fundamental questions regarding how genomes work and evolve; helping other researchers with the application of bioinformatics via collaboration.

What are your most important publications?

Wang, J*, L. Song*, D. Grover*, S. Azrak, M.A. Batzer, Liang P. dbRIP: A Highly Integrated Database of Retrotransposon Insertion Polymorphism in Human. ***Human Mutat*** 27:323-329, 2006.
Received a total of 137 citations since 2006.

Tan Y, Tu C, Meng L, Yuan S, Sjaarda C, Luo A, Du J, Li W, Gong F, Zhong C, Deng HX, Lu G, Liang P*, Lin G*. Loss-of-function mutations TDRD7 lead to a rare novel syndrome combining congenital cataract and non-obstructive azoospermia in humans. ***Genetics in Medicine***
Accepted on June 20, 2017
This paper illustrates the power of bioinformatics in finding disease genes

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What courses are you involved in teaching?

BIOL / BTEC / BCHEM 4P06; BIOL / BTEC 5P06: Bioinformatics
BIOL 4P41: Human Molecular Genetics
BIOL 3P50: Molecular Genetics
BIOL 5P95, 7P95: Graduate Seminar

What is your teaching philosophy?

Provide the students with the BIG picture first before getting into the details.
Get the students interested in the subject rather than let them feel that they need the course just for credit.
Help students apply what they learn.

Best advice for students wanting to be successful in your class?

Be interested and motivated and work hard.

What research opportunities are available for students through your research group?

I take graduate students at both MSc and PhD levels, undergraduate students for Honours thesis, summer research and volunteer work as well as high school mentorship students.

What are some actions students should take if they are interested in assisting a professor with his or her research?

Talk to your professors and start volunteering in the lab.

Words of advice for students interested in a career in your field or subject area?

Go with interdisciplinary.
For biology students, try to get some computer science and/or statistics training
For computer science students, try to get some training in biology.

What do you think are your most significant research accomplishments?

The development of dbRIP, a database for Retrotransposon Insertions Polymorphisms in humans.

This is still the only genetic database that focuses on this special type of genetic variations in humans and it has received a lot of journal citations with many from top tier journals. Continuation of the work is still a significant part of ongoing research in my lab.

What do you see yourself doing in 10 years?

Not quite sure to be honest. But I hope to be able to help more students get into the field of bioinformatics/genomics. I also hope to get a few more important projects done, which should benefit the research in this field.