

Learning to Live the High Life: Decoding the Genetic Basis of Adaptation

Keynote Address

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Abstract

Adaptation to changing environment is a key central evolutionary process and is at the core of some of the greatest challenges facing us. Humans for example, have successfully adapted to living at high altitudes above 10,000m, where Oxygen levels are at 80% of normal. An adapting population leaves a variety of detectable signatures in genomes, in the form of distortions in polymorphism patterns, and these have been intensely investigated. In this talk, we start by developing a unifying framework that encapsulates the strengths and weaknesses of existing tools. Next, we develop novel computational approaches to improving performance of the tools, and solving some outstanding problems. We apply our techniques to decoding the genetic basis of human highlander adaptation, in collaboration with experimental scientists..

Bibliography

Vineet Bafna joined the UCSD in 2003, after seven years in the biosciences industry. He received his Ph.D. in Computer Science from Pennsylvania State University in 1994, and was a post-doctoral researcher at its Center for Discrete Mathematics and Theoretical Computer Science for two years. From 1996-99, Bafna was a senior investigator at SmithKline Beecham, conducting research on DNA signaling, target discovery and EST assembly. From 1999 to 2002, he worked at Celera Genomics, ultimately as Director of Informatics Research, at a time when Celera was decoding the human genome. He arrived at the Jacobs School from the Center for Advancement in Genomics, recently set up by Celera founder Craig Venter. Bafna has been on the Program Committees of the past two annual International Conferences on Research in Computational Biology (RECOMB), and is on the editorial board of the Journal of Bioinformatics and Computational Biology (JBCB). He received his B.Tech from the Indian Institute of Technology in 1989, and has published two dozen articles in major journals and conference proceedings.

