



# Precision Wellness INITIATIVE

Revolutionizing personalized disease prevention and wellness through transformative research in evolution, genomics, metabolomics, and lifestyles.

## SYMPOSIA SERIES

### **We're One—But We're Not the Same: The Genetic Basis of Differential Human Physiology**

**WEDNESDAY**

**MARCH 6, 2019**

5:30 PM - 7:30 PM

Thomas W. Keating Bioresearch Building | Room 103  
1657 E. Helen St., Tucson, AZ, 85721

*Wine and Cheese Served*

While we tend to be genetically similar to each other, there are important differences among humans caused by natural selection as our ancestors adapted to their local environments in different regions of the world. In this talk, I will give three examples of human physiological adaptation to the local environment. The first concerns physiological adaptation to the hypoxic environment at high-altitude. Tibetans harbor adaptive genetic variants in two genes that affect hemoglobin production. The second example is adaptation of the Inuit of Greenland to life in the Arctic, including low temperatures and a diet based primarily on fish and marine mammals rich in  $\omega$ -3 polyunsaturated fatty acids (PUFAs). The third example concerns the Bajau people—sea-nomads that obtain most of their food by free-diving. Our genetic analyses show that these groups have adapted to acute hypoxia via enlarged spleens, an organ that contracts in response to the dive stimulus to provide an oxygen boost through the expulsion of red blood cells. I will use these examples as an illustration of the importance of evolutionary thinking in human genetics and medical research more generally.



**Rasmus Nielsen, PhD**  
Evolutionary Biologist | UC Berkeley

#### **UA PANELISTS**

Brian Hallmark, PhD  
Joanne Berghout, PhD  
Ryan Gutenkunst, PhD

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