

## NATURAL SELECTION VS. NEUTRAL EVOLUTION

What is the contribution of each of these two processes (natural selection and neutral evolution) to the evolution of genomes?

In 1983, in a book called [The Neutral Theory of Molecular Evolution](#), M. Kimura summarized his theory that was first published [in Nature](#) in 1968. He claims that “*the overwhelming majority of evolutionary changes at the molecular level are not caused by selection acting on advantageous mutants, but by random fixation of selectively neutral or very nearly neutral mutants...*”.

As far as natural selection is concerned, there are several examples of strong selection which very quickly spreads the mutation in the population. The lactase persistence in some population is the most striking example (see [Schlebusch et al., 2012](#)). In many situations, however, it is not easy to determine if a DNA trait was under selective pressure or originated from neutral evolution.

With respect to this debate, Hunter B. Fraser (Stanford) has just published a paper in [PNAS](#). He says “*I introduce an approach to detecting selection (on quantitative traits) that makes minimal assumptions and only requires phenotypic data from ~10 individuals*”; And concludes: “*In sum, this test is applicable to phenotypic data from almost any genetic cross, allowing selection to be detected more easily and powerfully than previously possible.*”.

Moreover, with regard to the above mentioned question, his work reaches an important conclusion: “*Applied to empirical data, the test reveals widespread selection in both domesticated and wild species*”.