

Obesity genetics

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New evidence that genetics plays a key role in obesity is published today in the *International Journal of Bioinformatics Research and Applications*. The findings relate to the genetics of modern Pima Indians who have an unusually high rate of obesity but could be extrapolated to all people. Their obesity is thought to be linked to a thrifty metabolism that allowed them to metabolize food more efficiently in times when little was available but causes problems when food is in abundance.

Mark Rowe, David McClellan, and colleagues at Brigham Young University in Provo, Utah, USA, have studied the effect of evolutionary selection on Pima Indians, a people indigenous to the present-day Sonora desert of Arizona and New Mexico. The researchers anticipated an effect consistent with higher metabolic efficiency among these people and focused specifically on recently discovered variations in their mitochondrial DNA, so-called SNPs, or single nucleotide polymorphisms.

The metabolic rates of 200 obese Pima individuals were measured and revealed that two of the three known SNPs influence metabolic efficiency. The researchers then used the genetics software TreeSAAP, to analyze the biochemical changes caused by these SNPs and then tracked the evolutionary selection of these genetic variations in 107 different types of mammals. This allowed them to propose a mechanism by which these SNPs affect the mitochondrial respiratory chain and consequently increase metabolic efficiency in the Pima people.

The team suggests that an increased metabolic efficiency could have



been an evolutionary advantage. The SNPs may have persisted because they helped the Pima survive the harsh dietary environment of the Sonora desert throughout the history of the people. In the current environment of caloric over-consumption an increased efficiency is unfavorable and may contribute to the high rates of obesity among the Pimas.

While the Pima Indians are an extreme case, the entire human population may also have evolved in a restricted caloric environment, say the researchers. Many populations may exhibit similar SNPs that were advantageous to our ancestors but may now be detrimental. The presence of these SNPs may thus provide one explanation as to why obesity is so rife in the 21st century.

Source: Inderscience Publishers

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