

# Supplements are not nutritious

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Selenium supplementation, for example in mineral tablets, might not be that beneficial for the majority of people according to researchers writing in the open access journal *Genome Biology*. Although this trace element is essential in the diet of humans, it seems that we have lost some of the need for selenium, which occurs in proteins and is transported in blood plasma, when our evolutionary ancestors left the oceans and evolved into mammals.

The research team including Alexey Lobanov and Vadim Gladyshev of the University of Nebraska-Lincoln and Dolph Hatfield of the National Institutes of Health conducted the genetic analysis. “Several trace elements are essential micronutrients for humans and animals but why some organisms use certain ones to a greater extent than others is not understood” comments Gladyshev. “We’ve found that the evolutionary change from fish to mammals was accompanied by a reduced use of proteins containing selenium.”

Selenium-containing proteins evolved in prehistoric times. Several human disorders have been associated with a deficiency in the trace element, among them are Keshan disease, a heart disorder affecting primarily children in certain provinces of China where the soil is deficient in selenium, and Myxedematous Endemic Cretinism, a rare form of mongolism attributed to deficiencies in selenium and iodine found in certain areas of Africa. Selenium supplementation was thought to be necessary to prevent these and other diseases even in the areas with adequate selenium supply.

The evolved reduced reliance on selenium invites questions regarding the widely accepted use of supplements incorporating this trace element to maximize amounts of proteins that rely on it. Supplements are taken without knowing which groups of the population can benefit.

Interestingly, only 20% of lower organisms use selenium-based proteins, and, for example, fungi and vascular plants do not. Some insects have also lost the need for selenium during the course of evolution. Aquatic environments seem to favor an increased reliance on selenium because of environmental factors. Selenoprotein-rich Sea urchins, for instance, feed on algae, which themselves contain a lot of selenium.

Gladyshev concludes: “The evolved reduced utilization of selenium-containing proteins in mammals raises important questions in human and animal nutrition. Selenoprotein expression is regulated such that people don’t need to rely so heavily on dietary selenium which is often present in excess amounts in the diet. Individuals should consider their age, sex and medical needs before taking such supplements on a regular basis.”

Source: BioMed Central

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