Certain genes when exposed to the environment may lead to diabetes

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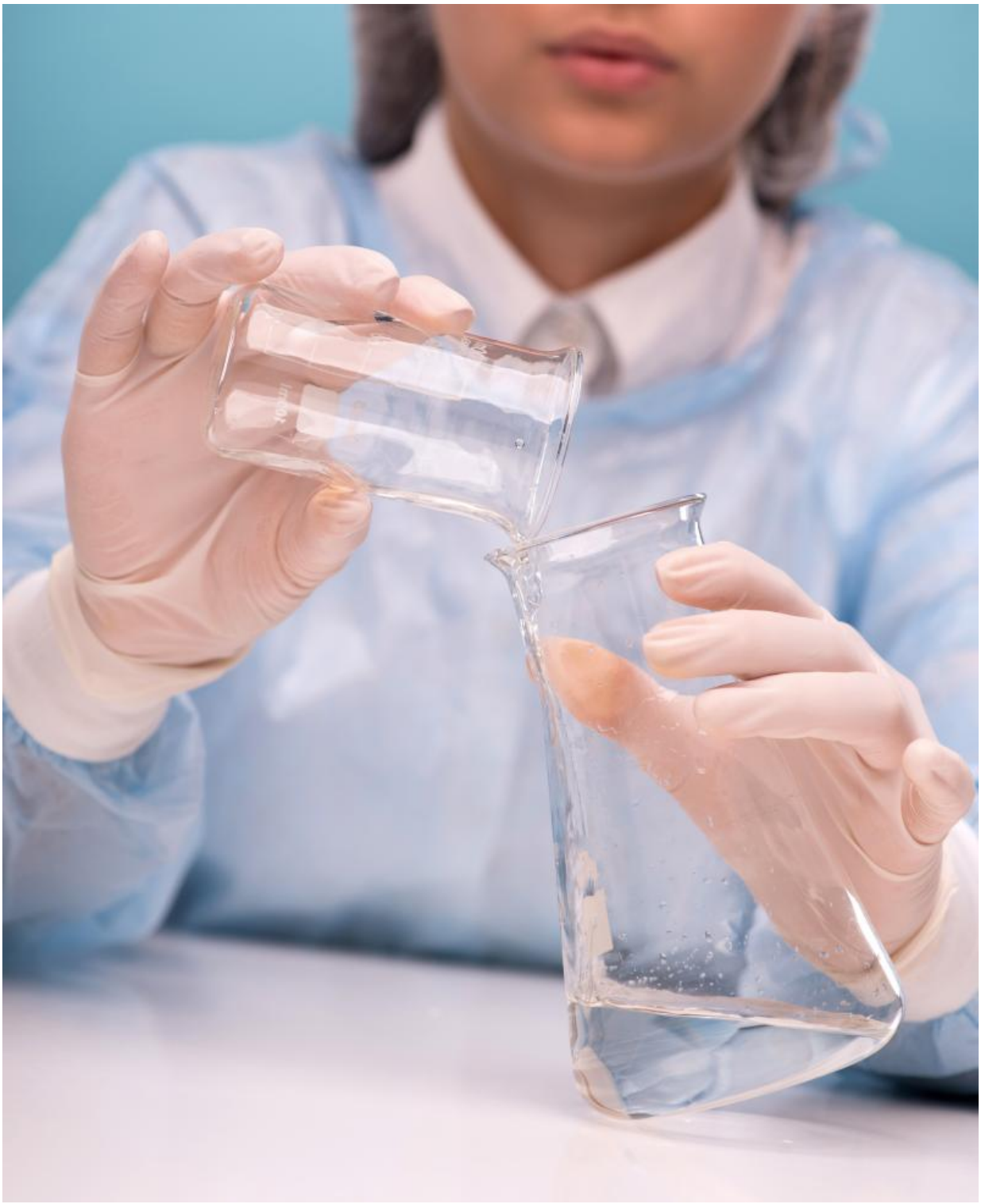

Water analysis

Arsenic, which can be present in ground water, modifies an enzyme that alters the secretion of insulin in the pancreas.

Physicians usually describe type II diabetes as a consequence of imbalanced food intake and lack of exercise; however, there are about 50 genes that cause changes in DNA, known as polymorphisms, that when combined with harsh environmental factors increase risk of developing the disease, says PhD Marta Ostrosky Wegman, director of the Institute for Biomedical Research the National University of Mexico (UNAM).

"This does not mean that everyone who is exposed to pollution will have diabetes, only those who are susceptible will develop polymorphisms," she says.

She adds that there are substances known as obesogenic and diabetogenic, like pesticides, cadmium, the chemical bisphenol A, among others, which may alter genes.

The best known is arsenic, which comes from groundwater and contaminates the tap water of northern Mexican states like Coahuila, Sonora, Chihuahua and Hidalgo. In Mexico, mining and overexploitation of underground aquifers are the main factors that contaminate water.

The researcher at the UNAM, who for 20 years has conducted several scientific studies, found that people who drink this water are more susceptible to developing diabetes, because arsenic modifies the enzyme calpain 10, which alters insulin secretion by the pancreas.

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In this regard, she noted that in vitro research in the area of the Laguna Region (comprised of three cities in the states of Coahuila and Durango) has found that people who drink large amounts of water contaminated with arsenic have polymorphisms in genes of calpain 10, which alters cells and prevents the body from taking advantage of glucose, thereby showing susceptibility to diabetes.

Therefore, the Laguna region implements measures to combat pollution of water by arsenic; one measure is to mix the contaminated liquid with the clean water and promote the intake of bottled water in areas where it is possible to acquire it.

Wegman Ostrosky detailed that arsenic besides being a diabetogenic factor also influences in the development of skin and bladder cancer. "We can not be so drastic and say that only eating carbs and not exercising is causing diabetes. There are other parameters that are related with genes and their interaction with the environment. We must know what toxic substances accumulate in the environment and avoid exposure to them."

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