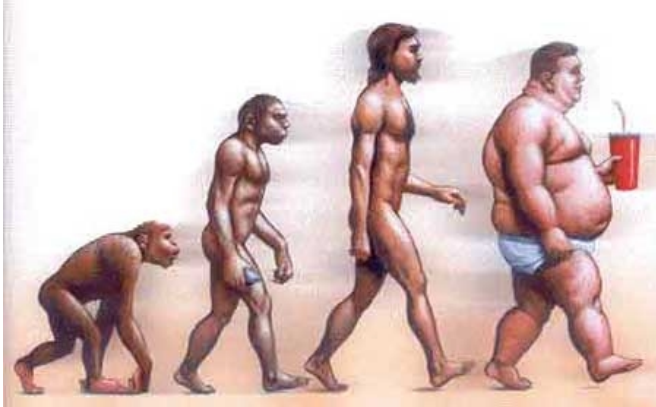


# Scientists link excess sugar to cancer

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Sugars are needed to provide us with energy and in moderate amounts contribute to our well-being. Sustained high levels of sugars, as is found in diabetics, damages our cells and now is shown that can also increase our chance to get cancer: The dose makes the poison as Paracelsus said.

It is well known that obesity is a leading cause of [diabetes](#), a disease where the body fails to control [blood sugar levels](#). [High blood sugar](#) levels are characteristic in obesity and diabetes. What is less well known is that diabetes and obesity are also linked to an increase in [cancer](#) risk. That is, the diabetic population has up to double chances to suffer pancreatic or [colon cancer](#) among others, according to well sustained [epidemiological studies](#). With obesity in British and Spanish children reaching 16%, the highest in Europe, this epidemic has major [health implications](#). How obesity or diabetes increase cancer risk has been a major health issue.

Scientists led by Dr. Custodia Garcia-Jimenez at the University Rey Juan Carlos in Madrid have uncovered a key mechanism that links obesity and diabetes with cancer: high sugar levels, which increase activity of a gene widely implicated in cancer progression.

Dr Garcia Jimenez's laboratory was studying how cells in the intestine respond to sugars and signal to the pancreas to release insulin, the key hormone that controls blood sugar levels. Sugars in the intestine trigger cells to release a hormone called GIP that enhances [insulin release](#) by the pancreas.

In a study published in *Molecular Cell*, Dr Garcia Jimenez's team showed that the ability of the [intestinal cells](#) to secrete GIP is controlled by a protein called  $\beta$ -catenin, and that the activity of  $\beta$ -catenin is strictly dependent on sugar levels.

Increased activity of  $\beta$ -catenin is known to be a major factor in the development of many cancers and can make normal cells immortal, a key step in early stages of [cancer progression](#). The study demonstrates that high (but not normal) sugar levels induce nuclear accumulation of  $\beta$ -catenin and leads to cell proliferation. The changes induced on  $\beta$ -catenin, the molecules involved and the diversity of cancer cells susceptible to these changes are identified.

Dr. Custodia García said "We were surprised to realize that changes in our metabolism caused by dietary sugar impact on our cancer risk. We are now investigating what other dietary components may influence our cancer risk. Changing diet is one of easiest prevention strategies that can potentially save a lot of suffering and money".

Colin Goding, Professor of Oncology at the University of Oxford, UK said 'Previously we were unsure about how increased blood sugar found in diabetes and obesity could increase cancer risk. This study identifies a key molecular mechanism through which high blood glucose would predispose to cancer. It opens the way for potential novel therapies aimed at reducing [cancer risk](#) in the obese and diabetic populations.'

Estimations published by the World Health Organisation (WHO): Obesity predisposes to diabetes and its prevalence is doubling every 20 years worldwide. More than 1 in 10 adults

worldwide (12%) are obese (BMI>30). 1 in 6 children in UK and Spain suffer obesity.

Diabetes caused 4.6 million deaths in 2011, more than 2 deaths per hour in Spain, more in USA. Worldwide, 1 in 10 adults (10%) suffered from diabetes in 2010 and more than one-third of individuals with diabetes are unaware they suffer from the disease. The national cost of diabetes or cancer is in the order of billions of pounds or euros in Spain or England.

More than half (63%) of premature deaths worldwide are due to non communicable diseases (NCD) of which cancer and diabetes are among the 4 causes more frequent.

At least 1 in 3 of the main cancers (27–39%) can be prevented by improving diet, physical activity and body composition.

Provided by University Rey Juan Carlos

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