

Fructose metabolism by the brain increases food intake and obesity

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The journal *Biochemical and Biophysical Research Communications* (BBRC), published by Elsevier, will publish an important review this week online, by M. Daniel Lane and colleagues at Johns Hopkins, building on the suggested link between the consumption of fructose and increased food intake, which may contribute to a high incidence of obesity and Type 2 diabetes.

Over the past four decades life-styles have gravitated toward the excessive consumption of 'high energy' foods and [sedentary behavior](#) that has resulted in a high incidence of obesity and its pathological consequences. This scenario has led to the increased occurrence of [insulin resistance](#) and [Type 2 diabetes](#). At present, approximately thirty percent of adult Americans can be classified as obese. Moreover, these changes now extend into the younger age group.

M. Daniel Lane and co-workers at The Johns Hopkins University School of Medicine in Baltimore have now pulled together work, largely in their laboratory (many papers beginning in 2000), dealing with the role of malonyl-CoA in the signaling system in the [brain](#) (specifically the hypothalamus) that has inputs into the higher brain centers that determine feeding behavior, most notably appetite. Two papers in the journal PNAS in 2007 and 2008 showed that glucose and [fructose](#) act quite differently in the brain (hypothalamus) - glucose decreasing [food intake](#) and fructose increasing food intake. Both of these sugars signal in the brain through the malonyl-CoA signaling pathway and have inverse effects on food intake.

Lane commented: "We feel that these findings may have particular relevance to the massive increase in the use of high fructose sweeteners (both [high fructose corn syrup](#) and table sugar) in virtually all sweetened foods, most notably soft drinks. The per capita consumption of these sweeteners in the USA is about 145 lbs/year and is probably much higher in teenagers/youth that have a high level of consumption of soft drinks. There is a large literature now that correlates, but does not prove that a culprit in the rise of teenage obesity may be fructose."

The fact that fructose metabolism by the brain increases food intake and obesity risk raises health concerns in view of the large and increasing per capita consumption of high fructose sweeteners, especially by youth.

More information: The article, appearing in Volume 382/1 (print edition: coverdate April 24) is available on ScienceDirect at [dx.doi.org/10.1016/j.bbrc.2009.02.145](https://doi.org/10.1016/j.bbrc.2009.02.145) .

Source: Elsevier

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