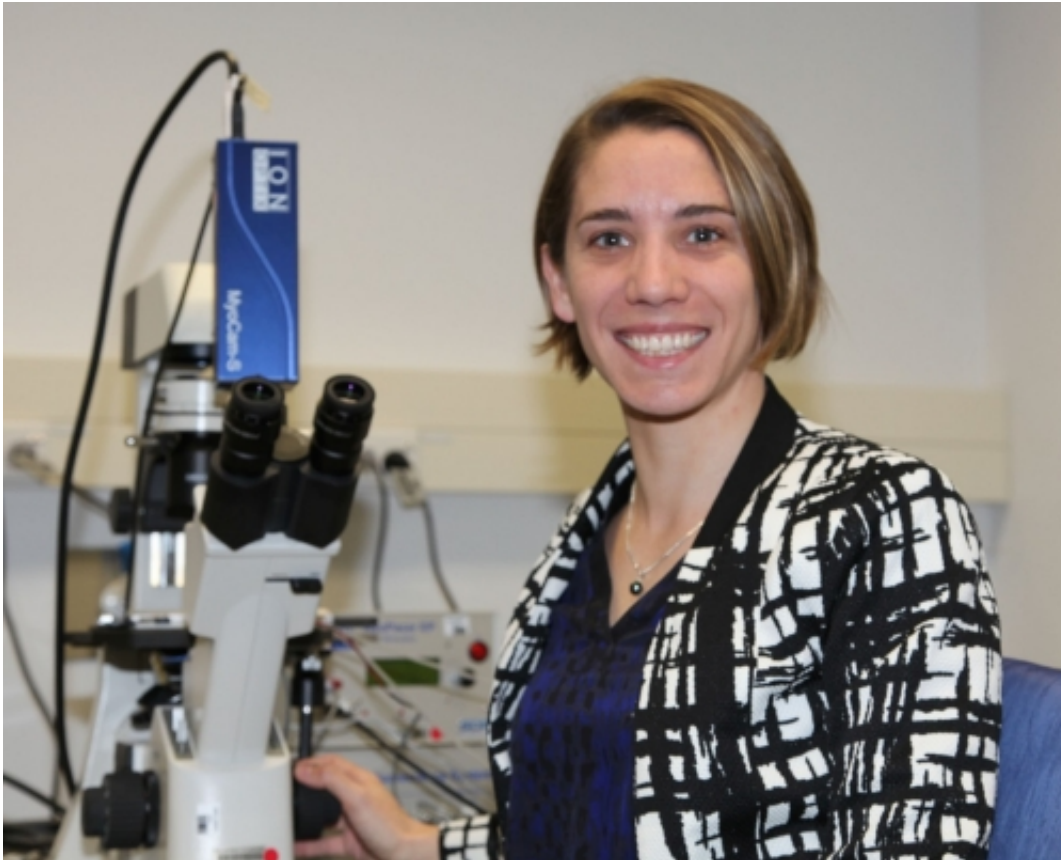


# Fructose – too much sugar for the heart?

July 12 2016, by Suzi Phillips

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Dr Kim Mellor is researching the links between fructose and heart muscle damage this year. Credit: University of Auckland

The impact of a high level of sugar intake on heart health will come under scrutiny this year in a new research project probing the link between fructose and diabetes.

The three-year Health Research Council funded project will be led by Dr Kimberley Mellor from the University of Auckland.

The investigation, titled 'Fructose and the [heart](#): targeting novel mechanisms of diabetic cardiomyopathy', aims to produce a significant advance in our understanding of the causes of [heart abnormalities](#) commonly seen in diabetic patients.

The ultimate hope is that this project will generate new information which can be used to develop treatment strategies to achieve health benefits for the large number of diabetic patients in New Zealand who have a high risk of heart disease.

"The rate of diabetes and death from diabetic complications in New Zealand is rising dramatically and is disproportionately high in Māori populations," says Dr Mellor.

"It is estimated that more than 80 percent of diabetic patients have heart failure," she says. "Heart abnormalities in diabetic patients are distinctive - and a specific treatment is not currently available."

As the diabetic epidemic has escalated in New Zealand and globally, so too has the dietary consumption of refined sugars – especially in the form of [fructose](#).

"Most of the fructose that we eat is in the form of sucrose, which is half fructose and half glucose," says Dr Mellor. "Fructose is the sweet sugar – it's sweeter than glucose, so it is often put into foods and drinks to make them sweet."

"Most studies, including our own, have so far looked at the relationship between consuming lots of sugar and the development of heart problems," she says. "Now we are working to understand the links

between the type of sugar consumed and the nature of the heart damage".

Dr Mellor says that her project focuses on the particular question "does fructose inflict direct damage on the heart, in addition to the more general problems which arise due to excess sugar calorie intake".

"Our studies suggest that fructose sugar may be a key instigator of heart damage in diabetes." says Dr Mellor. "This could arise from fructose in the diet, or activation of a pathway in the heart which produces fructose (the sorbitol pathway) which is known to be upregulated in diabetic hearts."

The project will be led by Dr Mellor with assistance from her Auckland colleague, Professor Peter Shepherd and an international collaborator, Professor Lea Delbridge from the University of Melbourne.

"This is the first study to focus on how fructose contributes to [heart muscle damage](#) from a molecular perspective and to look at how these molecular responses influence the heart in diabetes," says Dr Mellor.

"We think that there could be some heart muscle cell death pathways activated as a result of excess fructose metabolism," she says. "We also know that fructose can attach to proteins, alter the protein shape and function and cause cell dysfunction."

"Some of these pathways are well characterised already in relation to glucose [sugar](#), but we're putting forward the proposition that fructose has the potential to trigger different damage responses and this may be an important factor in explaining why the heart is vulnerable in diabetes" she says.

The three year project will include cell culture work (incubating [heart](#)

[muscle](#) cells with fructose to see what happens); experimental intervention studies to manipulate the genes that can regulate fructose metabolism; and investigation of fructose pathways in human heart tissue (from patients who have had cardiac surgery) from both diabetic and non-[diabetic patients](#).

Provided by University of Auckland

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