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New Zealand opens doorways for better diabetic heart health

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May lead to a massive change in the lives of people with Type 2 Diabetes

Dr June-Chiew Han and fellow researchers from Waipapa Taumata Rau University of Auckland, New Zealand are looking closely at cells in diabetic heart muscles using the power of super resolution microscopy.

For the first time, scientists have been able to see minute structures of cardiac cells and observe, in fine detail, the behaviour of contractile proteins in early-stage diabetes.

They have found that there are fewer contractile proteins present in the diabetic cardiac cells than in healthy cardiac cells. These specific proteins are integral to the process which tightens heart muscles as part of the heart's life-sustaining pumping action to move blood around a body.

With specialist equipment designed at the Auckland Bioengineering Institute (ABI), the team also observed the diabetic heart muscle at work. Surprisingly they found that with fewer proteins to elicit a contraction response, the muscle from a diabetic heart maintains the same force as a muscle in a healthy heart.

"With fewer contractile proteins, what we would expect is that force developed would be lower," says Dr Han. "But this is not the case. What we found is the force developed by the diabetic muscle is the same despite fewer contractile proteins in early-stage diabetes."

Data from the team's pilot study, on heart muscles from rats, suggest a change in one specific protein, the calcium ion release channel known as the ryanodine receptor (RyR). The change of RyR appears to compensate for the contractile function to maintain the force of the muscle.

New funding of $150,000 from the Heart Foundation will support, over the next two years, further investigation of these doorways in the diabetic heart.