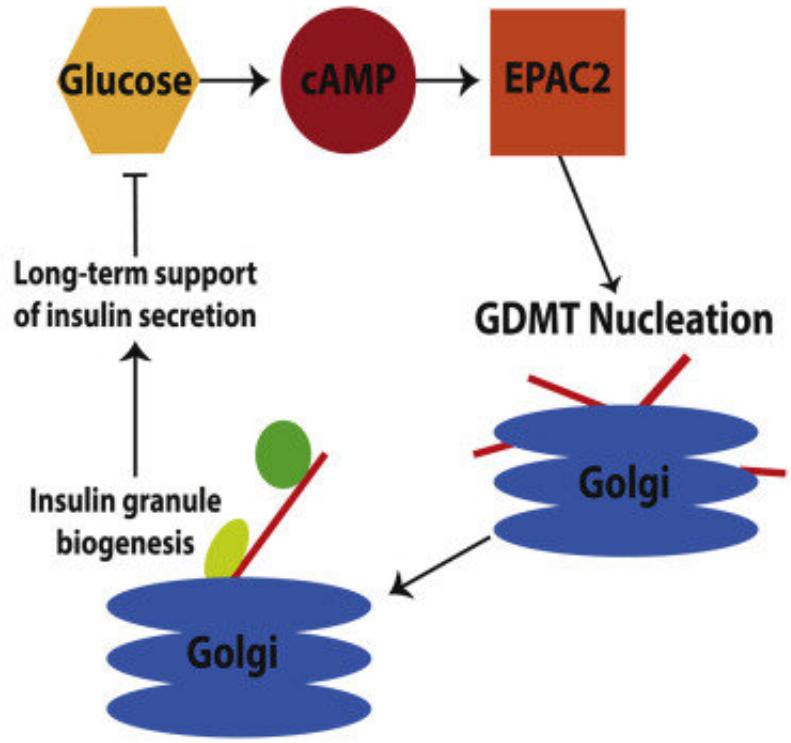
New role for microtubules in diabetes

August 1 2019, by Bill Snyder



Credit: *Current Biology* (2019). DOI: 10.1016/j.cub.2019.06.032

The failure of pancreatic beta cells to release appropriate amounts of insulin in response to rising blood glucose levels is a hallmark of type 2 diabetes.

During the past decade researchers have shown that microtubules—part of the cell's cytoskeleton—play an important role in regulating the

delivery of insulin granules to the cell membrane for secretion. Now Kathryn Trogden, PhD, and colleagues report that microtubules also are critical for the biogenesis of the granules themselves.

Microtubules, it turns out, are highly regulated by glucose acting through the ubiquitous messaging molecule cyclic AMP and its effector protein EPAC2. The glucose signal causes microtubules to disassemble and reassemble at the Golgi apparatus inside the cell, where insulin granules are formed.

Inhibiting EPAC2 blocked formation of new Golgi-derived microtubules and ultimately resulted in depletion of insulin granules in the beta cell, the researchers reported this month in the journal *Current Biology*.

Their findings provide further evidence that regulating microtubule dynamics may be a potential new approach to treating diabetes.

More information: Kathryn P. Trogden et al. Regulation of Glucose-Dependent Golgi-Derived Microtubules by cAMP/EPAC2 Promotes Secretory Vesicle Biogenesis in Pancreatic β Cells, *Current Biology* (2019). DOI: 10.1016/j.cub.2019.06.032

Provided by Vanderbilt University