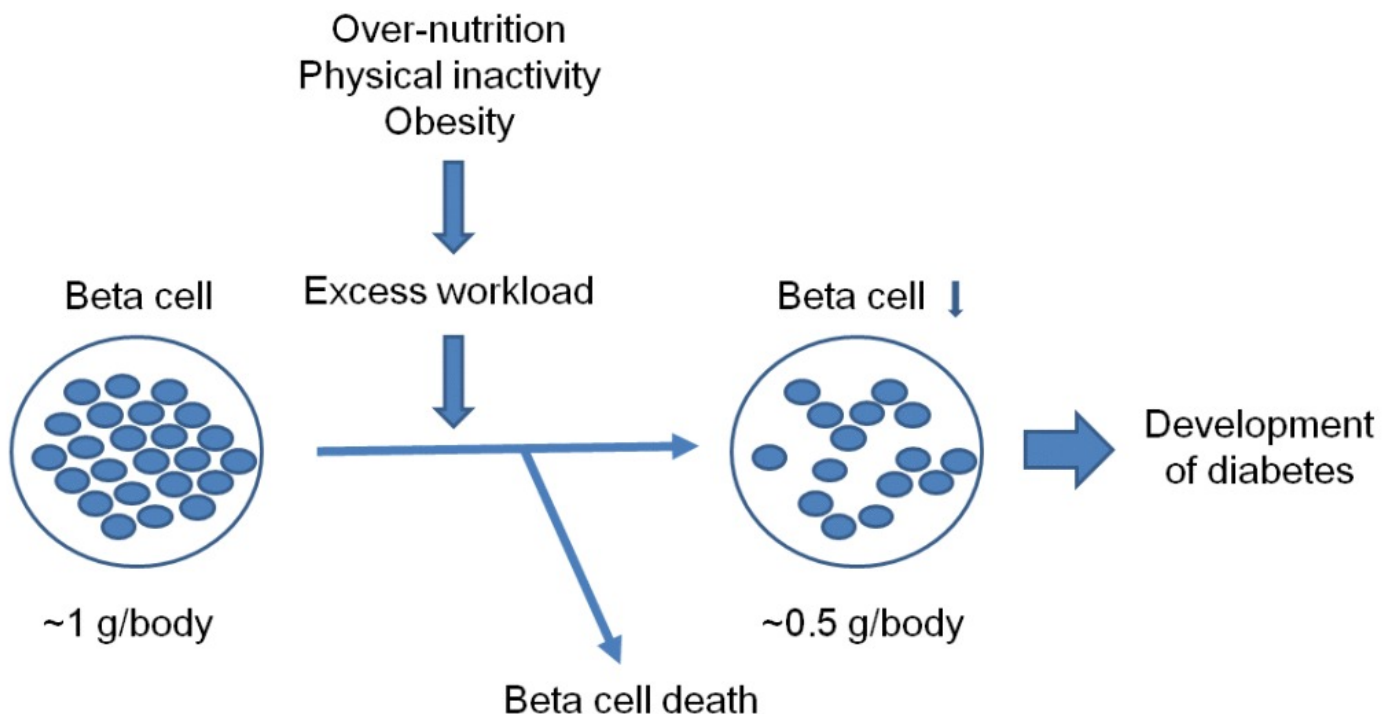


## Save your pancreas from diabetes! Your beta cell reserve is critical for prevention and treatment of diabetes.

To date the number of people with diabetes is estimated to be 387 million over the world. This number is continuing to increase and predicted to be 592 million in 2035. Despite the recent advance in the treatment of diabetes, we are still struggling to prevent the development of diabetes.

Why is it so difficult to prevent the development of diabetes? The majority of people with diabetes are classified as type 2 diabetes (T2DM). Obesity, over-nutrition and physical inactivity are attributable to the development of T2DM. In the modern, Westernized, or capitalism-based high consuming society, it is often difficult to keep healthy lifestyle. The challenge is how we gain high motivation to keep healthy lifestyle in a daily life. Better understanding the pathophysiology of T2DM is therefore important for not only healthcare providers but also the general population including people without diabetes.



Here we review the current knowledge of pathophysiology of T2DM and emphasize the importance of beta cell, which secretes insulin, a critical hormone to control blood glucose level. In contrast to type 1 diabetes, it is often emphasized that T2DM is characterized by obesity, hyperinsulinemia and insulin resistance. This implies that beta cell is not a problem in T2DM. This misinterpretation is further exaggerated by the rodent studies showing beta cell expansion to compensate insulin resistance.

Past	<u>Type 1 diabetes</u>	<u>Type 2 diabetes</u>
	Beta cell destruction Beta cell mass ↓↓ Insulin secretion ↓↓	Obesity Insulin resistance Hyperinsulinemia
Now	<u>Type 1 diabetes</u>	<u>Type 2 diabetes</u>
	Beta cell destruction Beta cell mass ↓↓ Insulin secretion ↓↓	Beta cell loss Beta cell mass ↓ Insulin secretion ↓
Causes	Autoimmune	Insulin resistance Beta cell overwork

However, recent studies have emerged that functional beta cell mass is already markedly reduced at the onset of T2DM. It has also shown that unlike rodents, the compensatory beta cell expansion to insulin resistance is markedly limited in humans. Based on these evidences, we here propose the beta cell workload hypothesis. In the face of insulin resistance, beta cells work harder to secrete more insulin to keep normoglycemia. If the excess workload on beta cell continues, stress-induced beta cell death eventually may occur and beta cell mass is reduced. Once beta cell mass reduced, the each residual beta cell will be exposed to the even greater workload, which results in a vicious cycle fostering further beta cell loss, reflecting the progressive nature of this disease.

We thus speculate that beta cell loss is critical for the development and treatment of T2DM and it is important to ameliorate beta cell workload for the prevention and treatment of T2DM.

Better understanding of T2DM is critical to gain high motivation to keep healthy lifestyle. Not only saying that the bad lifestyle is bad for your health, but also explaining that healthy lifestyle save your beta cell from diabetes may gain more attention from the society. We hope this review helps more people to adhere healthy lifestyle.

## Publication

[Importance of Beta Cell Function for the Treatment of Type 2 Diabetes.](#)

Saisho Y

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