

Structural insights into the inhibition of PPARgamma phosphorylation by CDK5 in the context of diabetes

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INTRODUCTION

Diabetes mellitus, commonly known as diabetes, is a metabolic disease that causes high blood sugar. The hormone insulin moves sugar from the blood into your cells to be stored or used for energy. With diabetes, your body either doesn't make enough insulin or can't effectively use the insulin it does make. Untreated high blood sugar from diabetes can damage your nerves, eyes, kidneys, and other organs. There are a few different types of diabetes :

- 1)Type 1 diabetes is an autoimmune disease.The immune system attacks and destroys the cells in the pancreas ,where insulin is made. Its unclear what causes this attack. About 10 percent people with diabetes have this type.
- 2)Type 2 diabetes occurs when your body becomes resistant to insulin,and sugar builds up in your blood.
- 3)Gestational diabetes is high blood sugar during pregnancy. Insulin-blocking hormones produced by the placenta cause this type of diabetes.

A rare condition called diabetes insipidus is not related to diabetes mellitus, although it has a similar name. It's a different condition in which your kidneys remove too much fluid from your body.

Symptoms of diabetes

The general symptoms of diabetes include :

- Increased hunger
- Increased thirst
- Weight loss
- Blurry vision
- Extreme fatigue

Treatment of diabetes

Doctors treat diabetes with a few different medications. Some of these drugs are taken by mouth, while others are taken through injections.

Type 1: Insulin is the main treatment for type 1 diabetes. It replaces the hormone your body isn't able to produce.

Type 2: Diet and exercise can help some people manage type 2 diabetes. If lifestyle changes aren't enough to lower your blood sugar, you'll need to take medication.

Gestational diabetes: you'll need to monitor your blood sugar levels several times a day during pregnancy. If it's high, dietary changes and exercise may or may not be enough to bring it down.

EXPERIMENTALS

In order to understand the overall organization of diabetes i.e crystal structure of the complex between PPARgamma LBD and the ligand NV1346(3a) (PDB ID : 6T9C). The primary cause of diabetes is the absence of a hormone called insulin or the inability of muscle and fat cells in the body to respond to this hormone and use glucose. Insulin is a protein hormone, produced by specific cells in the pancreas called beta cells (pronounced beta cells, figure 1).

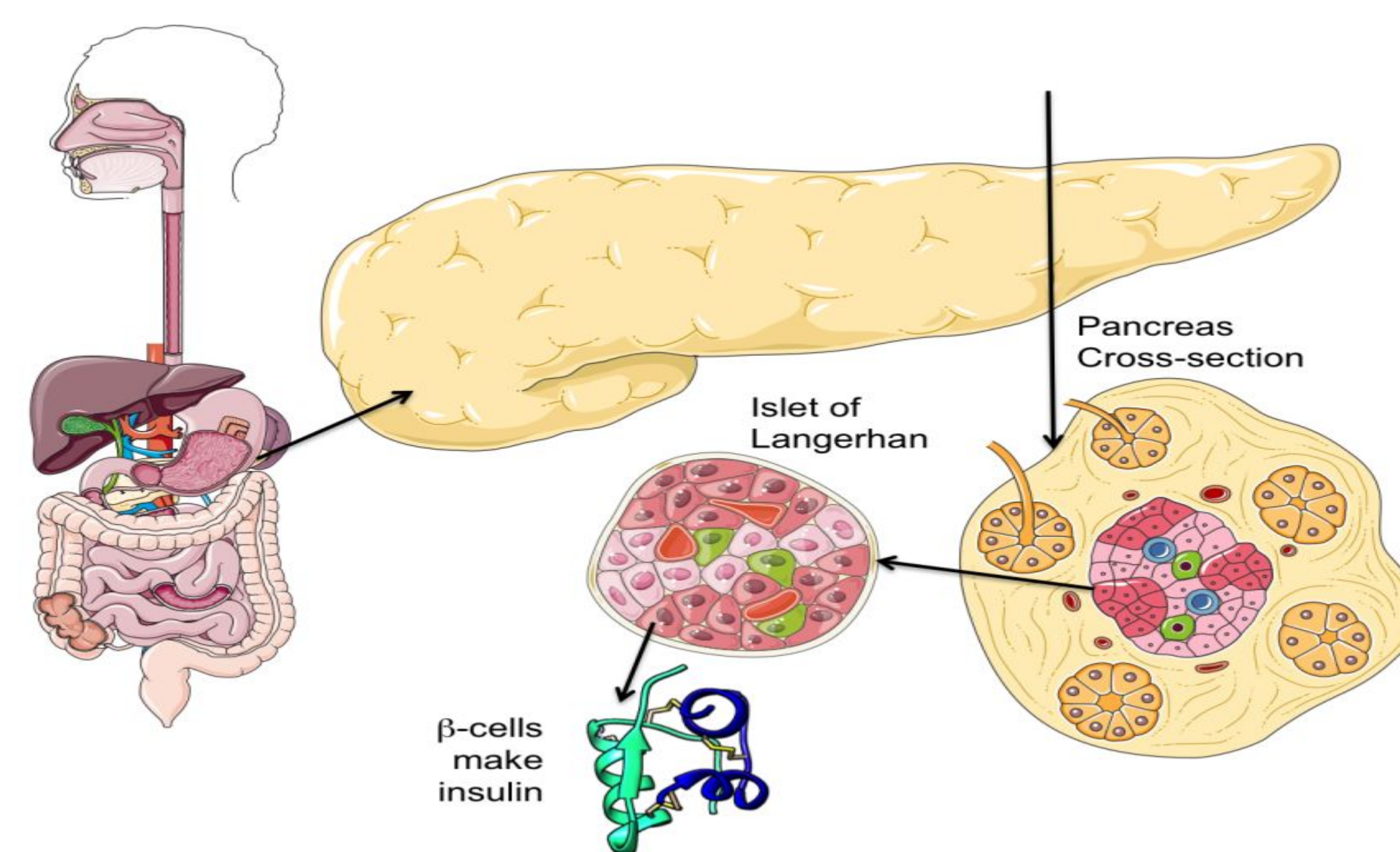


Figure 1: pronounced beta cells



Figure 2: pymol structural view of (PDB ID: 6T9C)

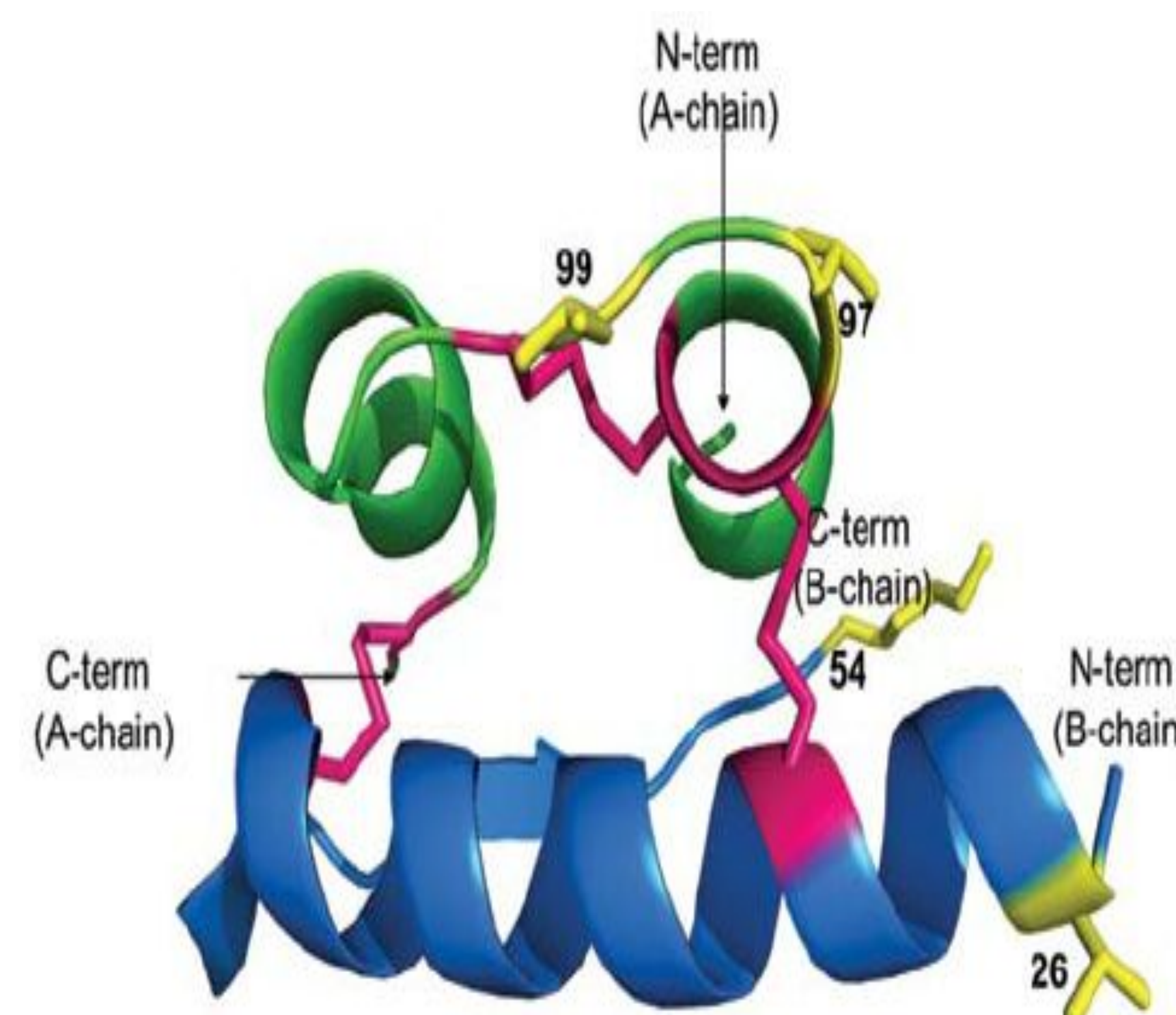


Figure 3: 3D structure of human insulin (1XDA). A-chain (green) covalently connected via disulfide bonds (magenta) to B-Chain (blue) of insulin.

RESULTS & DISCUSSION

The structure of diabetes contain insulin hormone which is a combination of two peptide chains (dimers) named an A-chain and B-chain, which are linked together by two disulfide bonds.The A-chain is composed of 21 amino acids, while the B-chains consists of 30 residues.

REFERENCES

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PYMOL structural report view

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