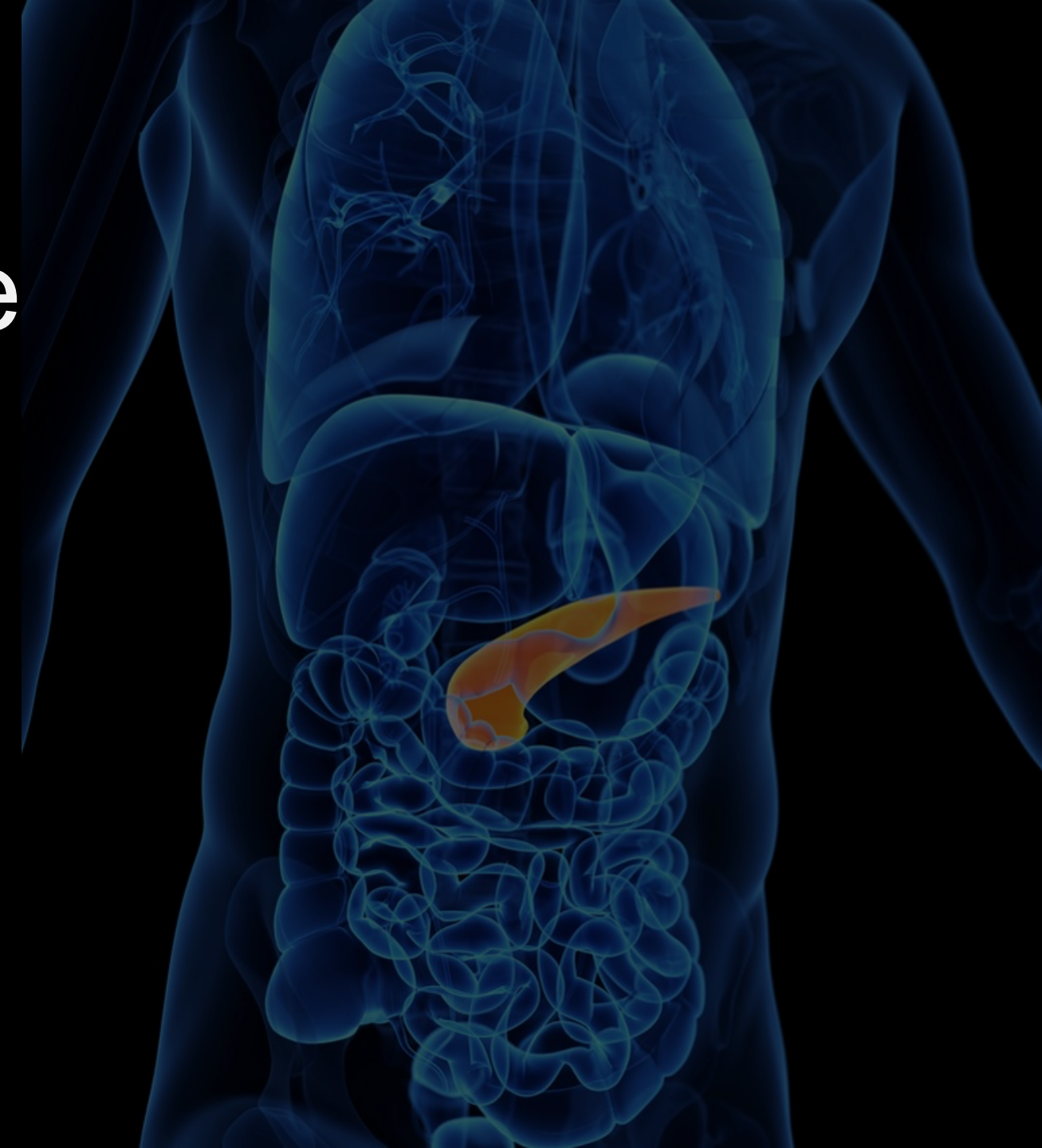# Does my patient have type 1 or type 2 diabetes?

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UNM
HEALTH SCIENCES
CENTER

Conflicts of Interest

None

Objectives

1. To contrast the pathophysiology behind type 1 and type 2 diabetes

2. To recognize the variable and often overlapping presentations of patients with type 1 and type 2 diabetes

3. To be familiar with testing that might lead to a diagnosis of type 1 or type 2 diabetes

Mystery Case

- 27 year-old woman with NEW diagnosis of DM
- Presents to clinic for follow up after recent

  What type of diabetes does my patient have?

- Physical exam: BMI 32
- Labs: +GAD antibody titer, low C-peptide level

Diabetes Trivia: type 1 or type 2?
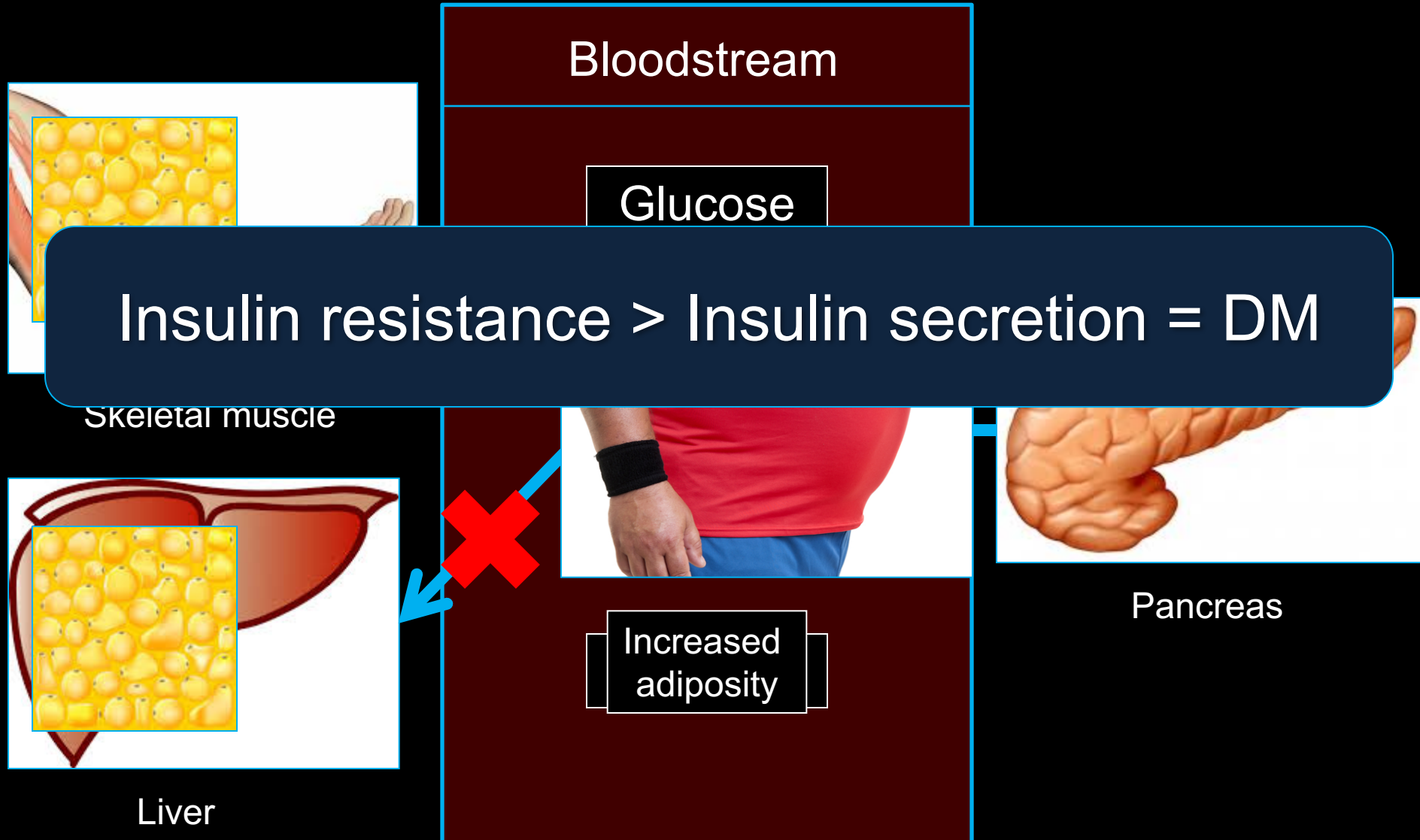
1. Most common form of diabetes

?

Diabetes Trivia: type 1 or type 2?

2. Pancreas secretes insulin but insulin signaling is impaired at the level of the liver and skeletal muscle

?

Disruption of insulin signaling results in elevated glucose levels in type 2 diabetes
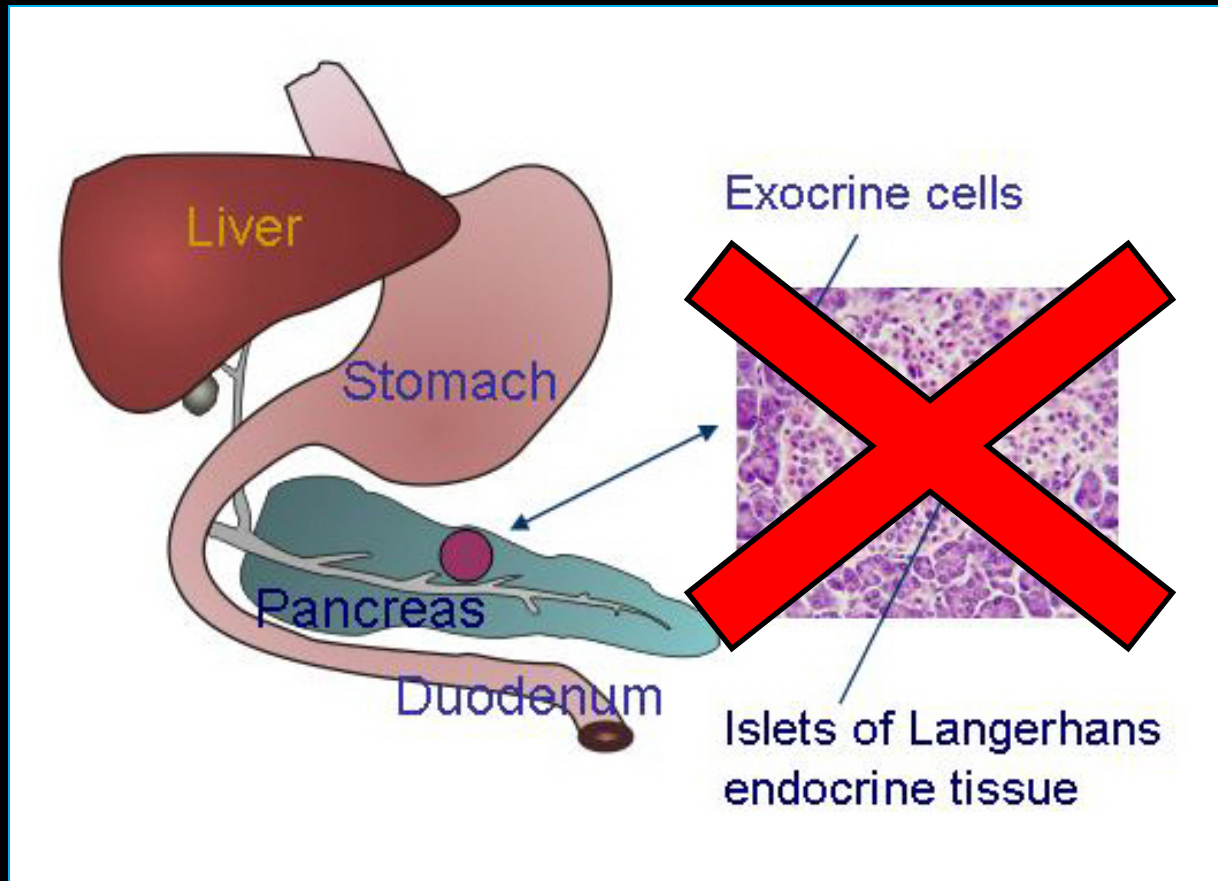
Bloodstream

Glucose

Insulin resistance > Insulin secretion = DM

Skeletal muscle

Liver

Increased adiposity

Pancreas

Diabetes Trivia: type 1 or type 2?

3. Not characterized by "insulin resistance" but rather an autoimmune destruction of the insulin-secreting pancreatic islet cells
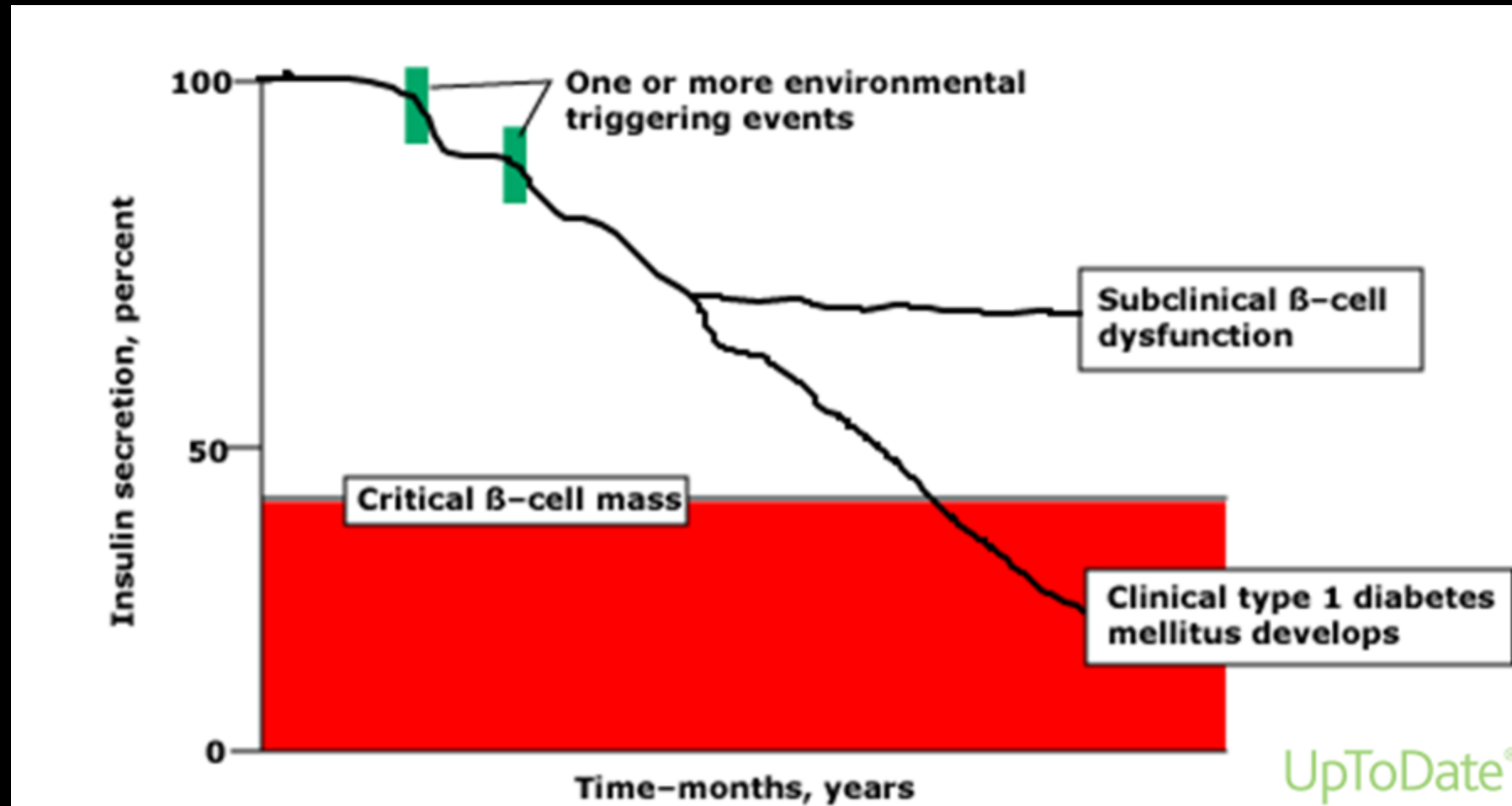
?

Insulin is secreted from beta cells within the pancreatic islets

Islet cell antibodies

- Progressive beta cell destruction

Time Course of Type 1 Diabetes

Diabetes Trivia: type 1 or type 2?

4. Is potentially "curable" with weight loss

?

Primary care-led weight management for remission of type 2 diabetes (DiRECT): an open-label, cluster-randomised trial

Michael EJ Lean*, Wilma S Leslie, Alison C Barnes, Naomi Brosnahan, George Thom, Louise McCombie, Carl Peters, Sviatlana Zhyzhneuskaya, Ahmad Al-Mrabeh, Kieren G Hollingsworth, Angela M Rodrigues, Lucia Rehackova, Ashley J Adamson, Falko F Sniehotta, John C Mathers, Hazel M Ross, Yvonne McIlvenna, Renae Stefanetti, Michael Trenell, Paul Welsh, Sharon Kean, Ian Ford, Alex McConnachie, Naveed Sattar, Roy Taylor*

- Weight loss group (n=149) vs control group (n=149)
- Mean duration of DM: 3 years
- Mean Age ~55 yrs
- Mean BMI ~35 kg/m^2
- Mean A1c ~7.5%

Primary care-led weight management for remission of type 2 diabetes (DiRECT): an open-label, cluster-randomised trial

Michael EJ Lean*, Wilma S Leslie, Alison C Barnes, Naomi Brosnahan, George Thom, Louise McCombie, Carl Peters, Sviatlana Zhyzhneuskaya, Ahmad Al-Mrabeh, Kieren G Hollingsworth, Angela M Rodrigues, Lucia Rehackova, Ashley J Adamson, Falko F Sniehotta, John C Mathers, Hazel M Ross, Yvonne McIlvenna, Renae Stefanetti, Michael Trenell, Paul Welsh, Sharon Kean, Ian Ford, Alex McConnachie, Naveed Sattar, Roy Taylor*
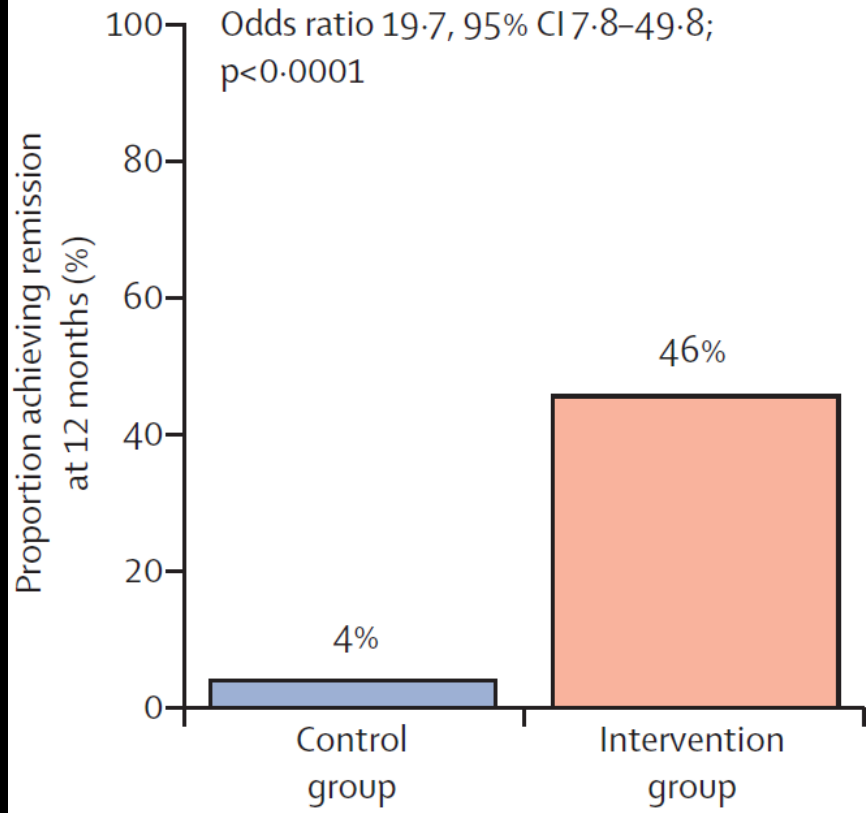
Mean weight loss of ~10% of total body weight resulted in remission in almost half of patients with T2D at 12 months

Lancet 2017; S0140-6736(17)33102-1.

Diabetes Trivia: type 1 or type 2?

5. Patients may be dependent on insulin injections

?

Diabetes Trivia: type 1 or type 2?

6. Diagnosed in childhood

?

Diabetes Trivia: type 1 or type 2?
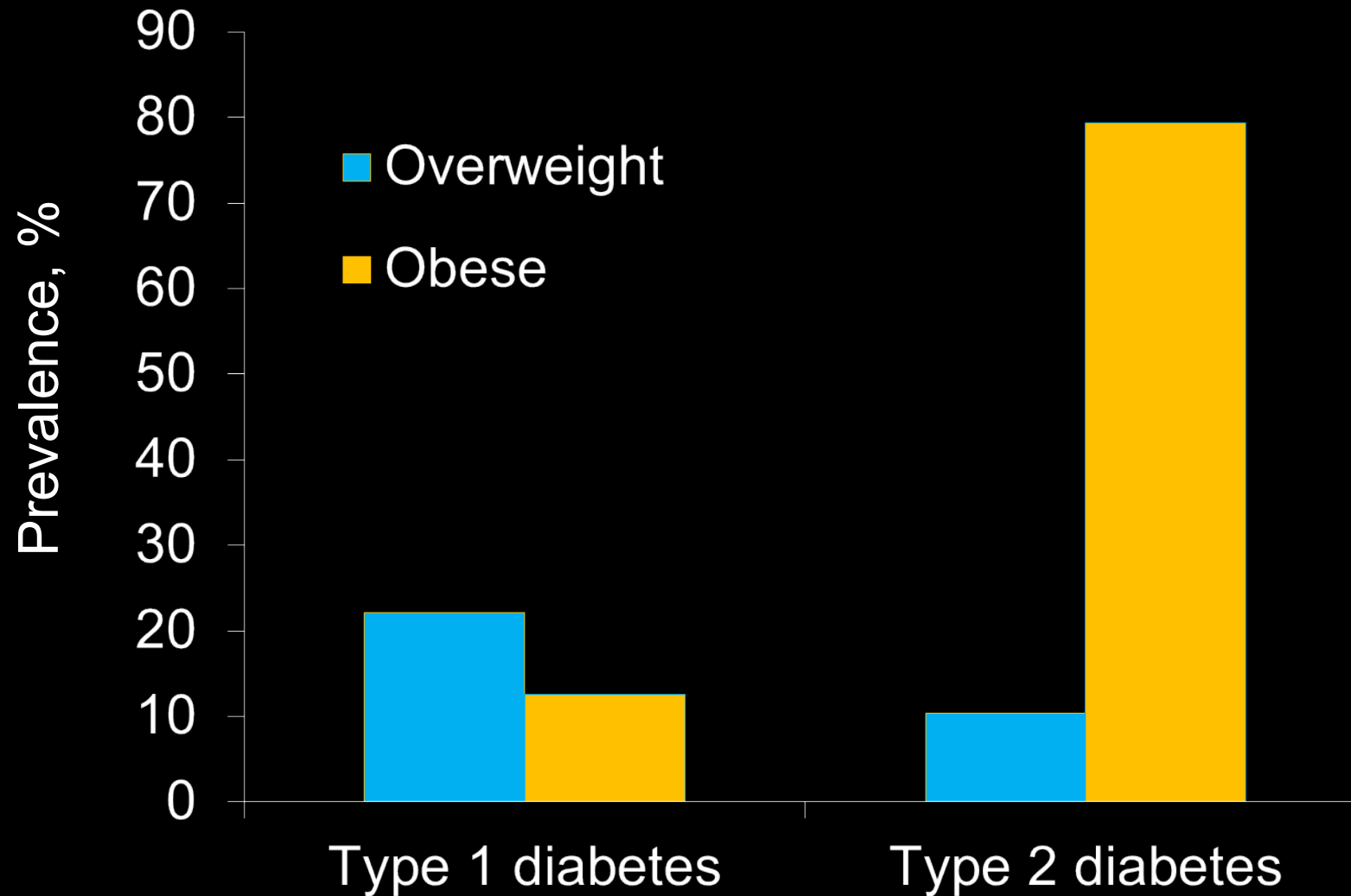
7. Diagnosed in adulthood

?

Diabetes Trivia: type 1 or type 2?

8. Patients may be obese

?

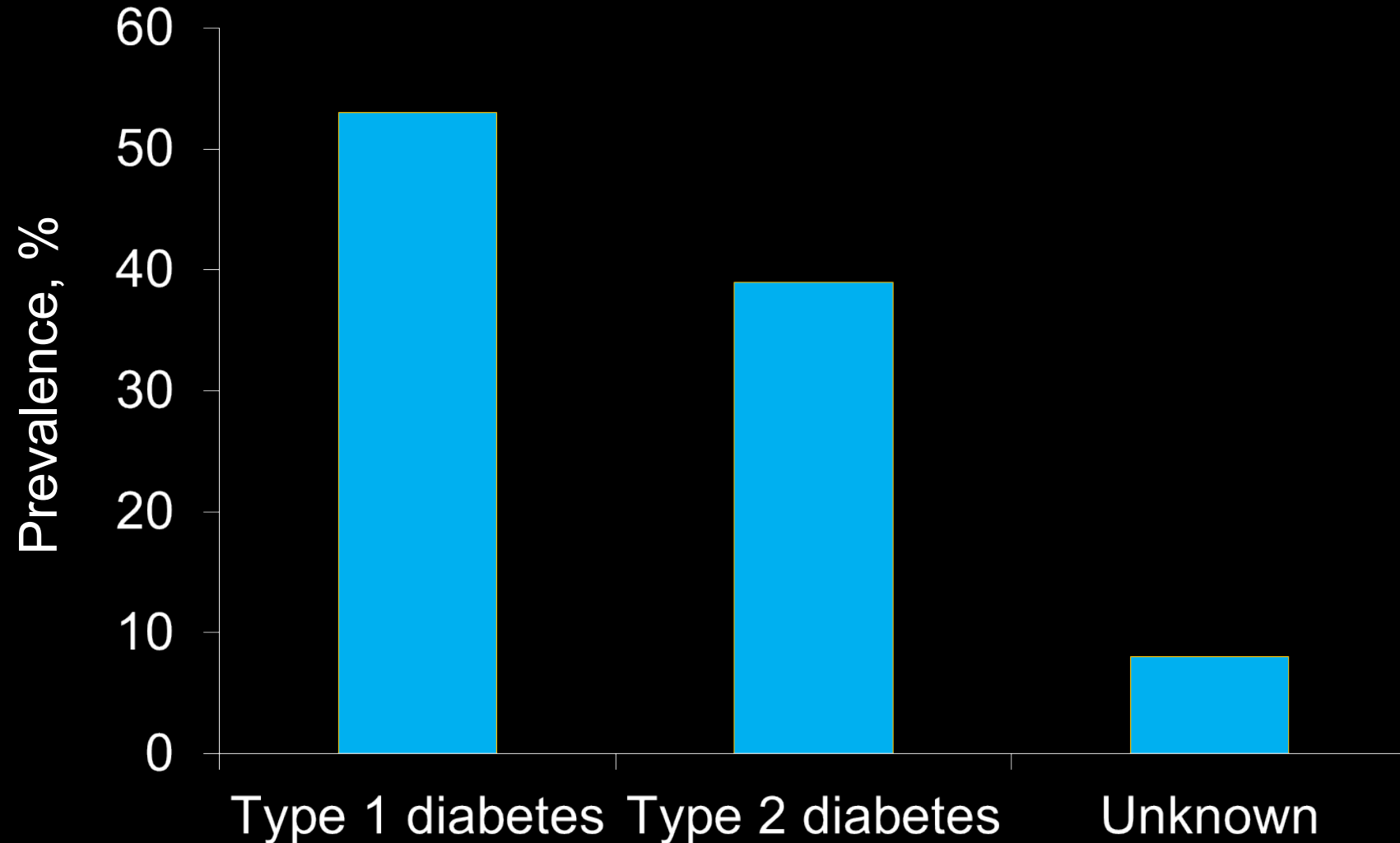# Prevalence of overweight and obesity in DM (SEARCH for Diabetes in Youth study)

Diabetes Trivia: type 1 or type 2?
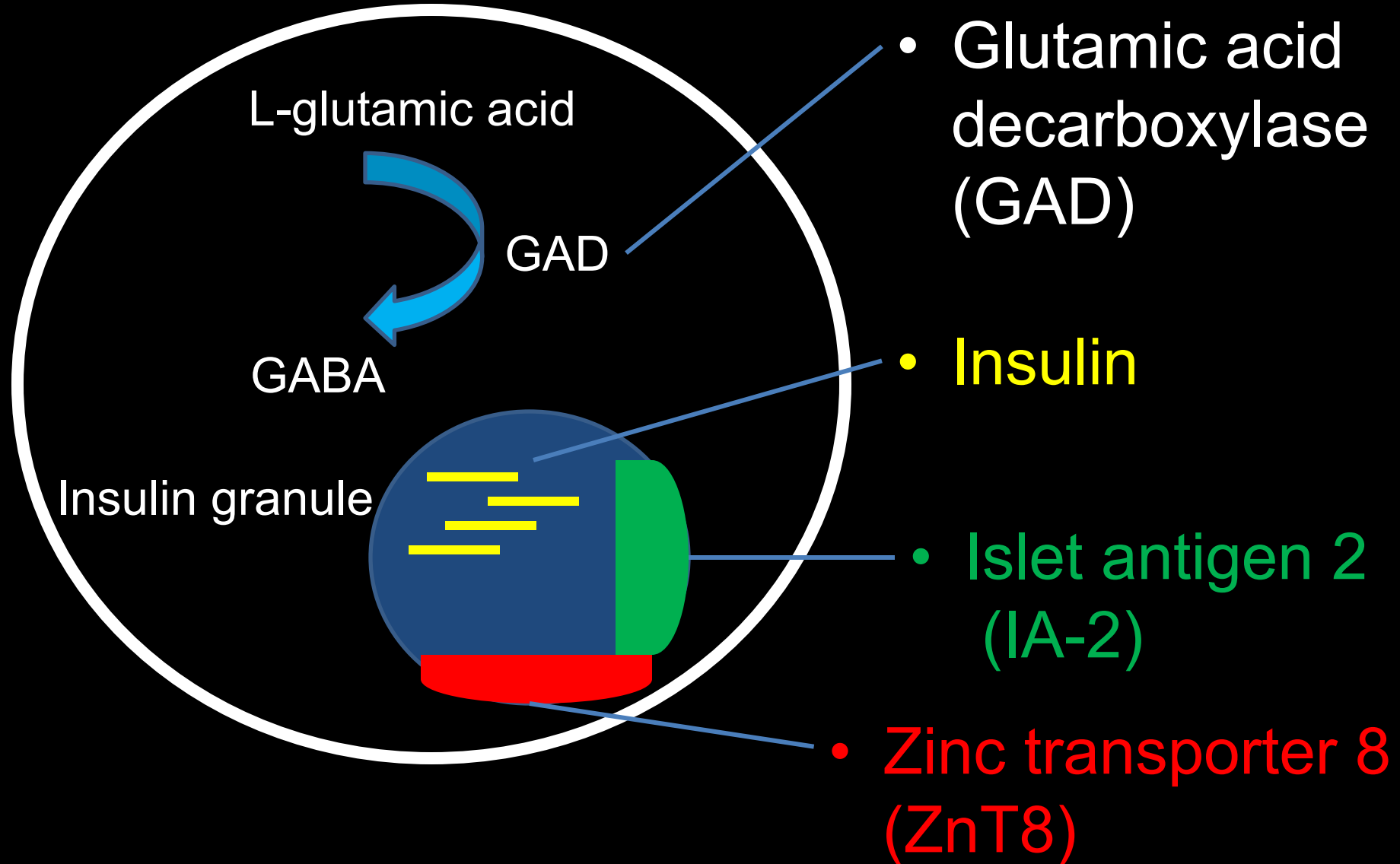
9. Patients may present in DKA

?

Diagnosis in 141 patients presenting in DKA

What about antibody testing?

Islet cell

L-glutamic acid

GAD

GABA

Insulin granule

- Glutamic acid decarboxylase (GAD)

- Insulin

- Islet antigen 2 (IA-2)

- Zinc transporter 8 (ZnT8)

Diabetes Trivia: type 1 or type 2?

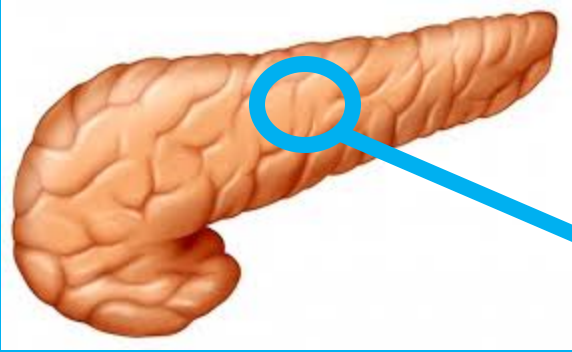10. May test NEGATIVE for islet cell auto-

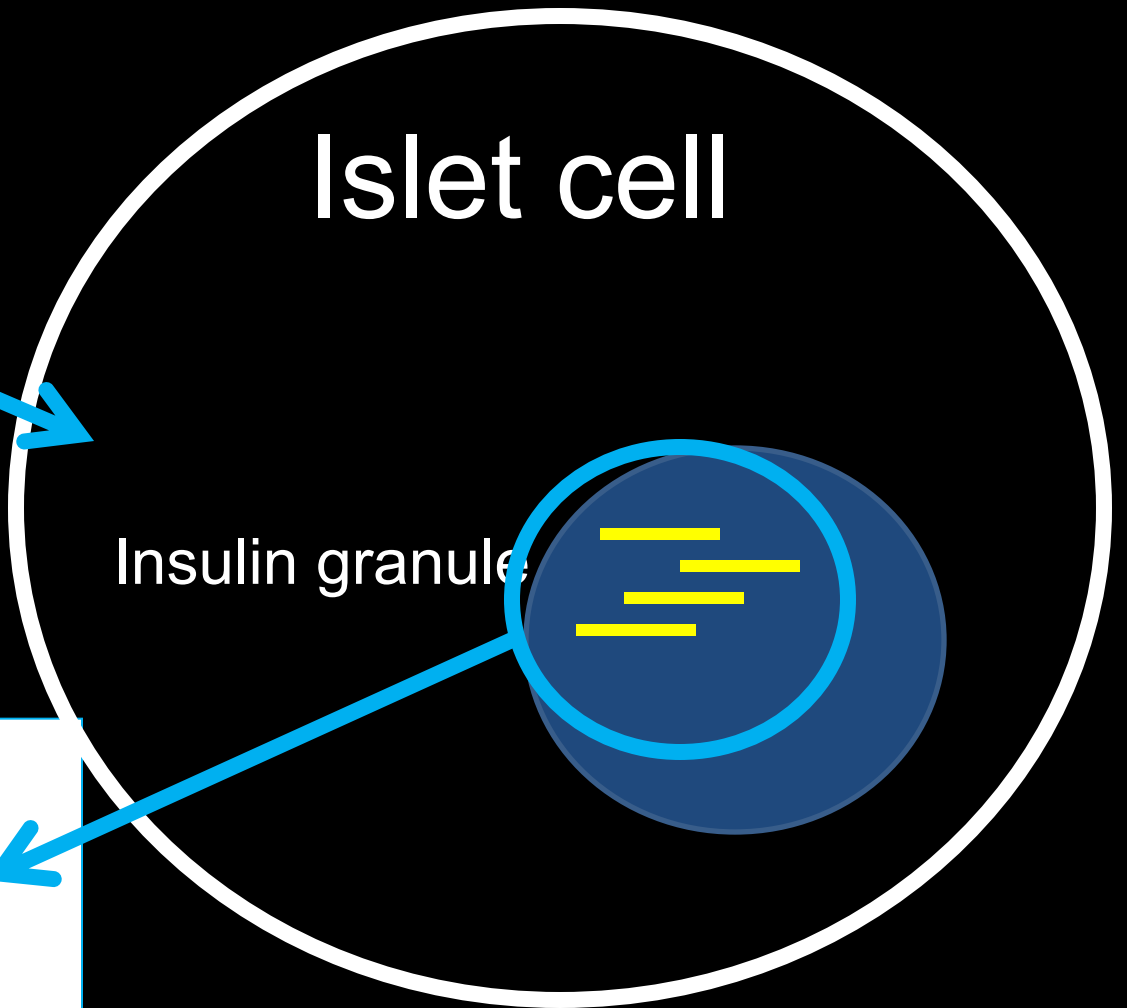15% of T1D/autoimmune DM patients test NEGATIVE for autoantibodies
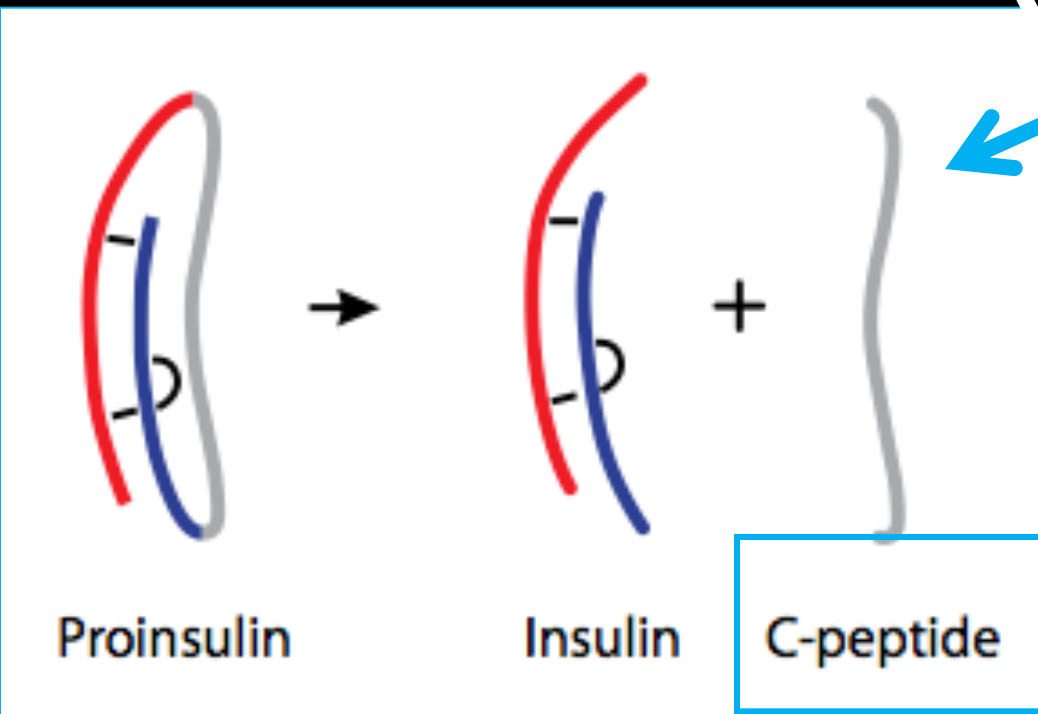
?

What about C-peptide testing?

Pancreas

Islet cell

Insulin granule

Proinsulin → Insulin + C-peptide

Marker of endogenous insulin production

Diabetes Trivia: type 1 or type 2?

11. May present with LOW C-peptide

Acute hyperglycemia may suppress endogenous insulin secretion

?

Does my patient have type 1 or type 2 diabetes?

Factors determining whether your patient has T1D or T2D must be considered together rather than in isolation

Questions?