

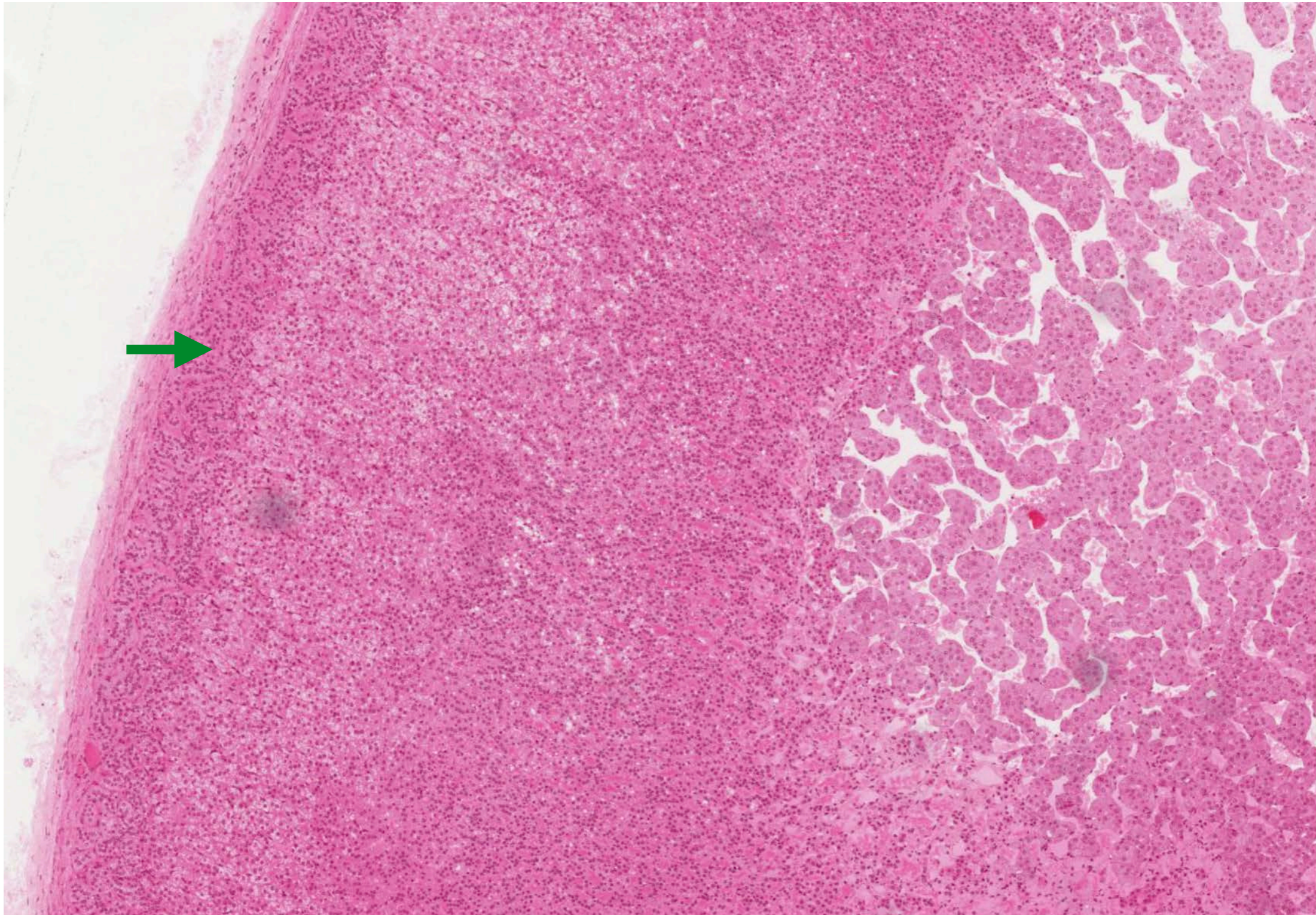
Endocrine System

Energy and Metabolism

Readiness Assessment Questions

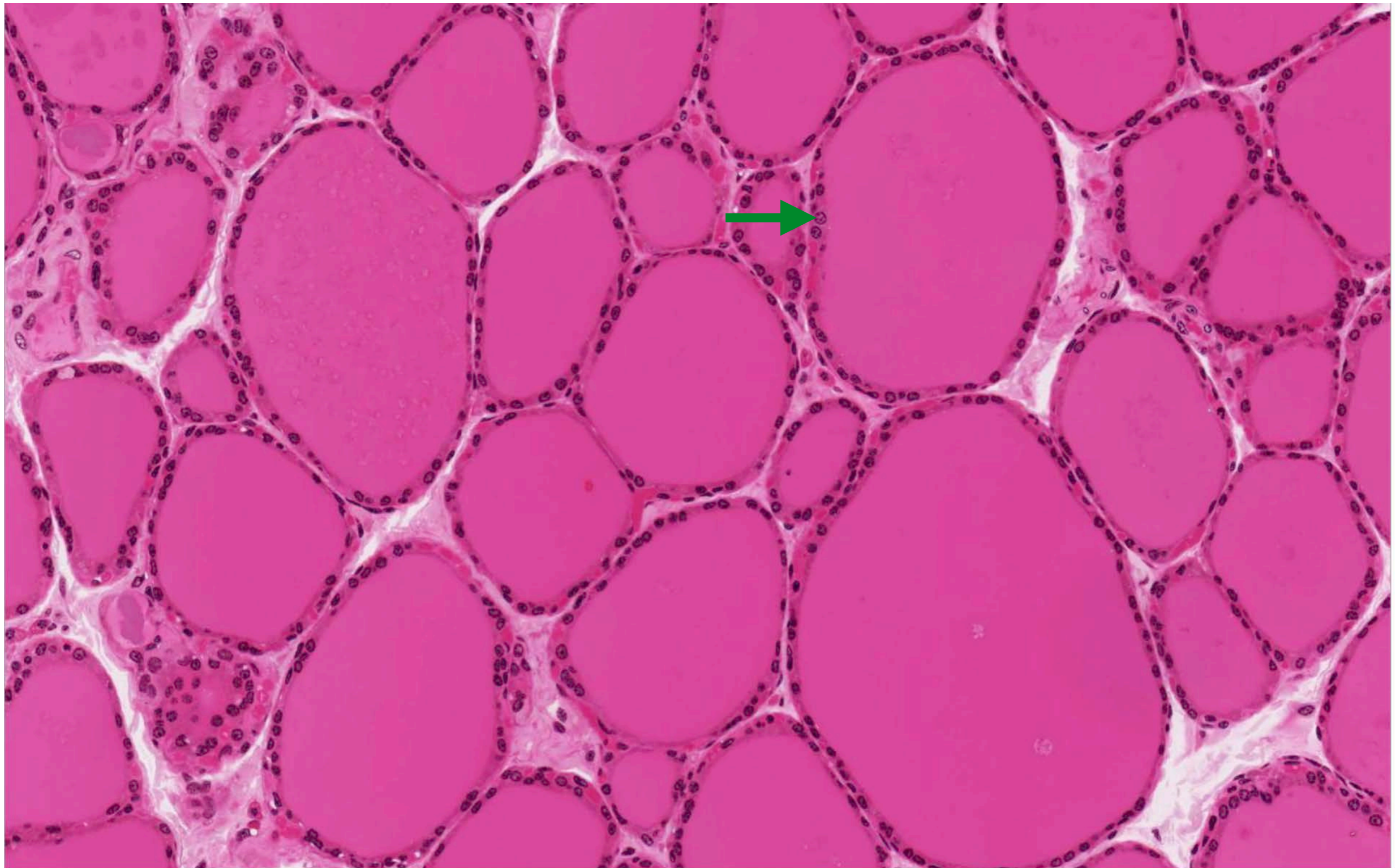
1. Which condition activates these cells to produce hormone?

- Low serum glucose
- Stress
- Low serum calcium
- Low blood pressure



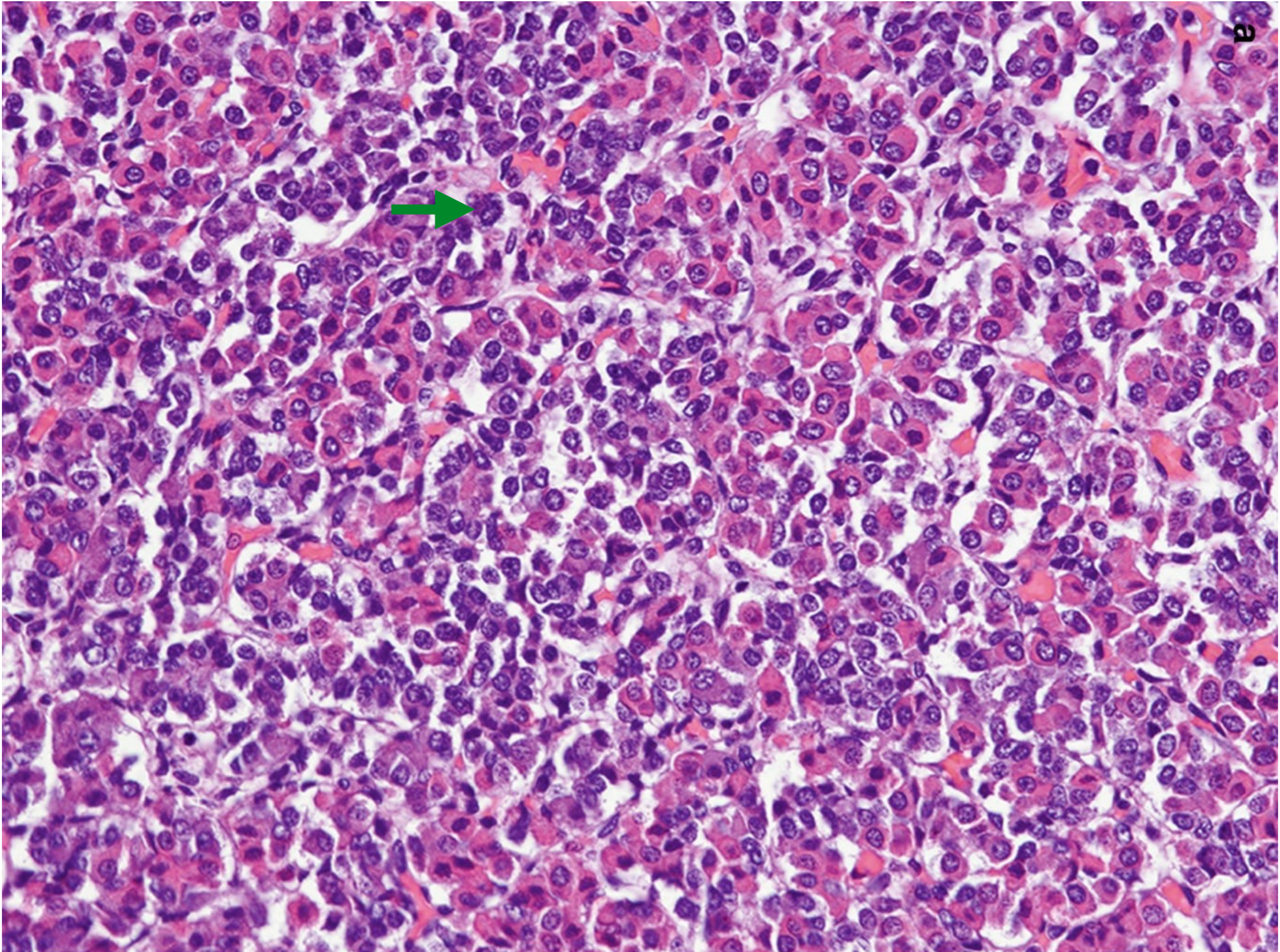
2. Which condition would cause these cells to become columnar?

- High serum TSH
- High serum T3
- Low serum calcium
- Low serum TSH



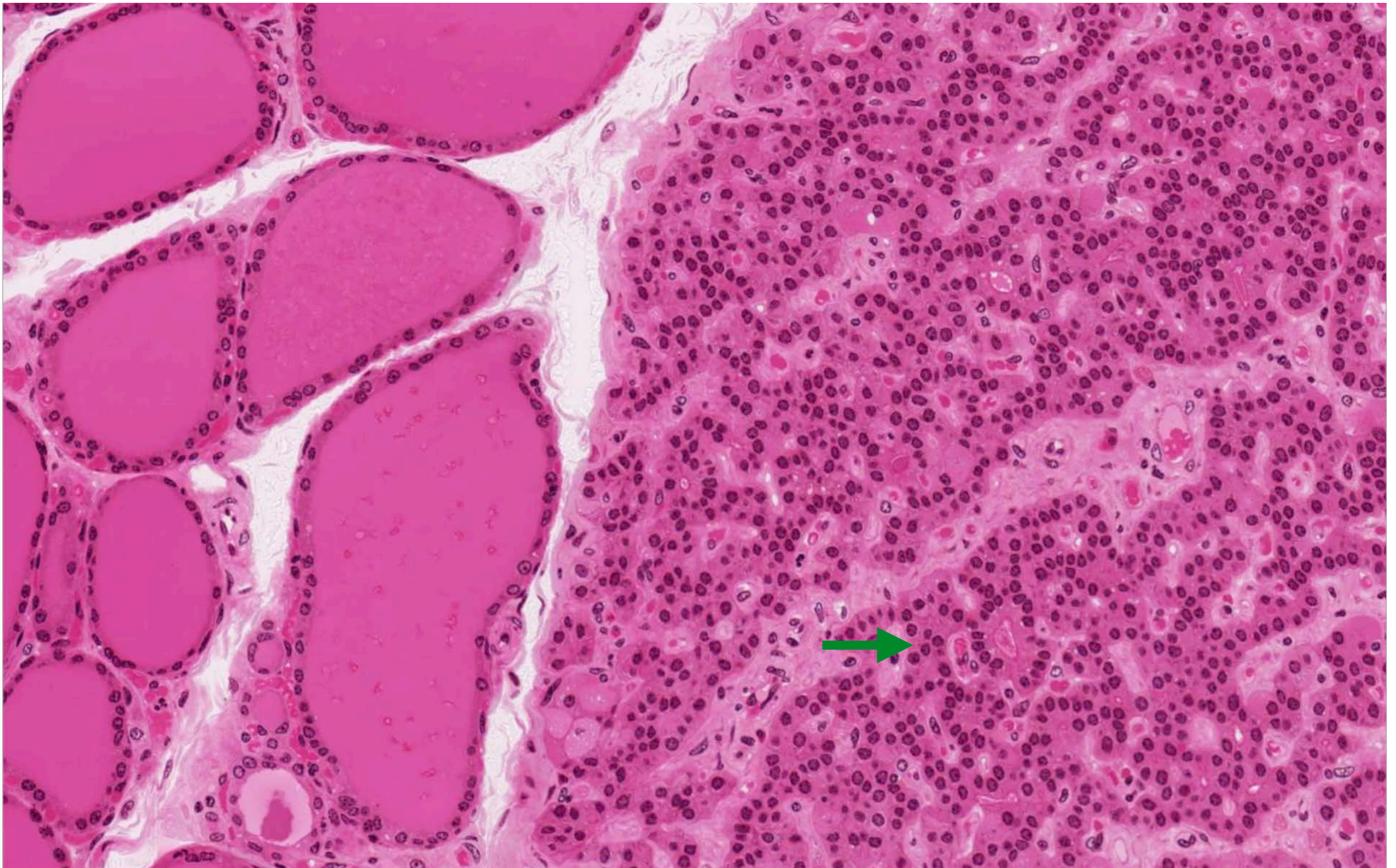
3. In this sample from the pituitary, the marked cell could secrete which hormone?

- Prolactin
- Growth hormone
- ACTH
- Oxytocin



4. These cells release hormone under which condition?

- Low blood pressure
- Low serum calcium
- High serum ACTH
- High serum TSH



5. The marked region releases hormone at a high rate under which condition?

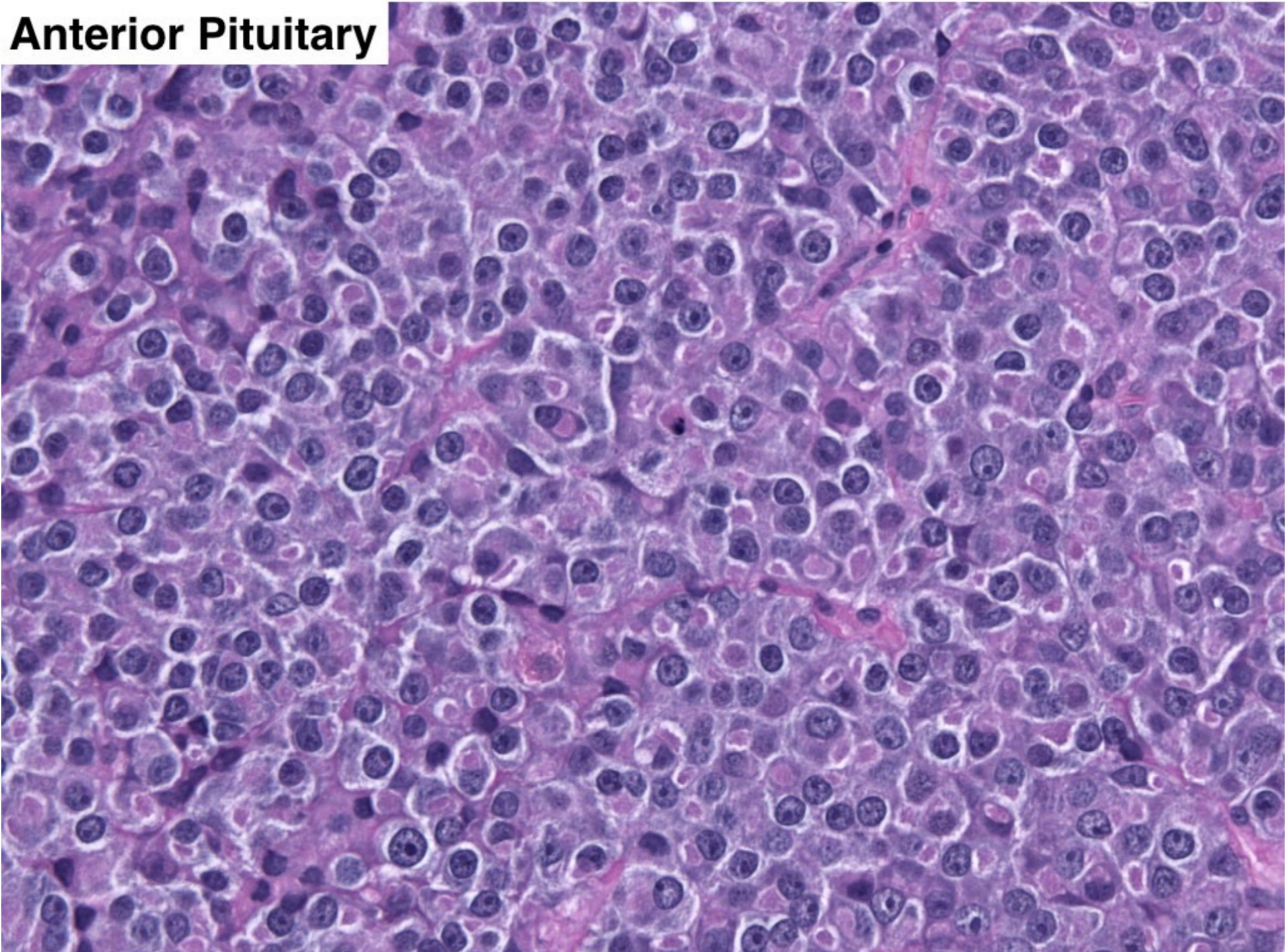
- Hypothermia
- External stress
- Child birth
- Hypocalcemia



Application Questions

During a routine checkup, a 30-year old patient presents with facial plethora (swelling/puffiness), accumulation of abdominal fat and weakness in the peripheral muscles. The patient is hypertensive and has elevated serum glucose. A pituitary MRI is inconclusive and a biopsy produces the image below. What structural changes do you observe in the biopsy?

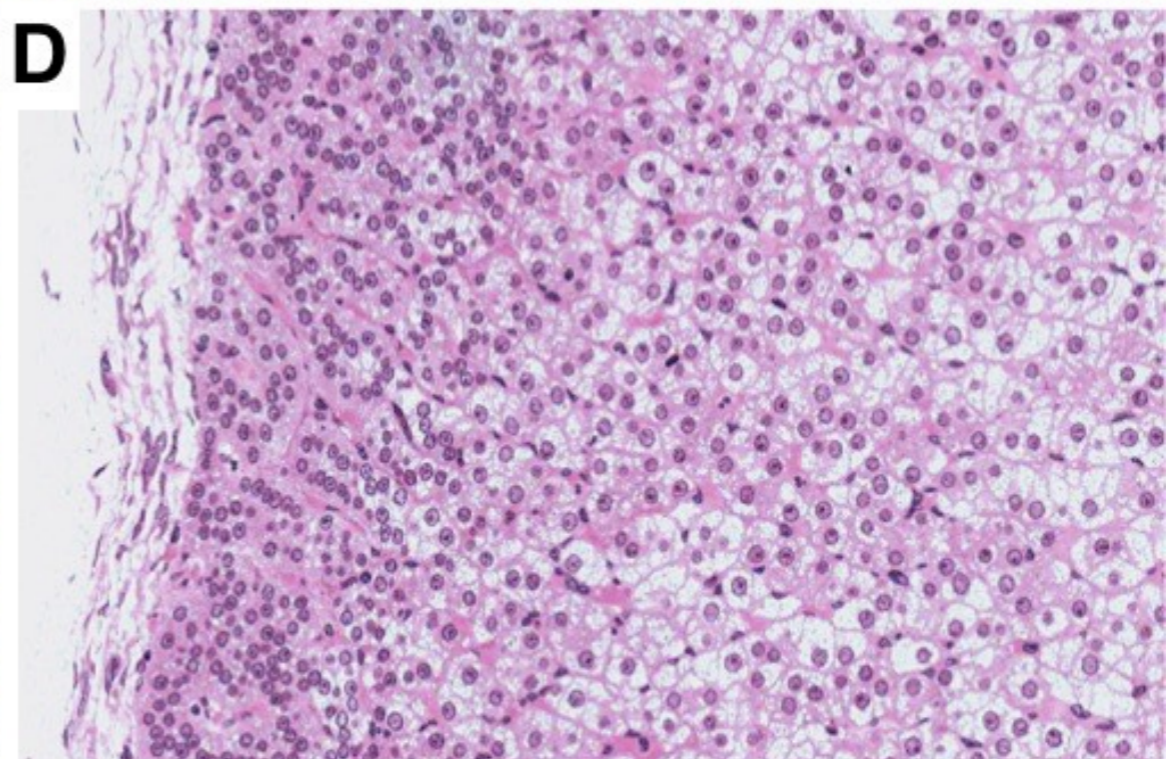
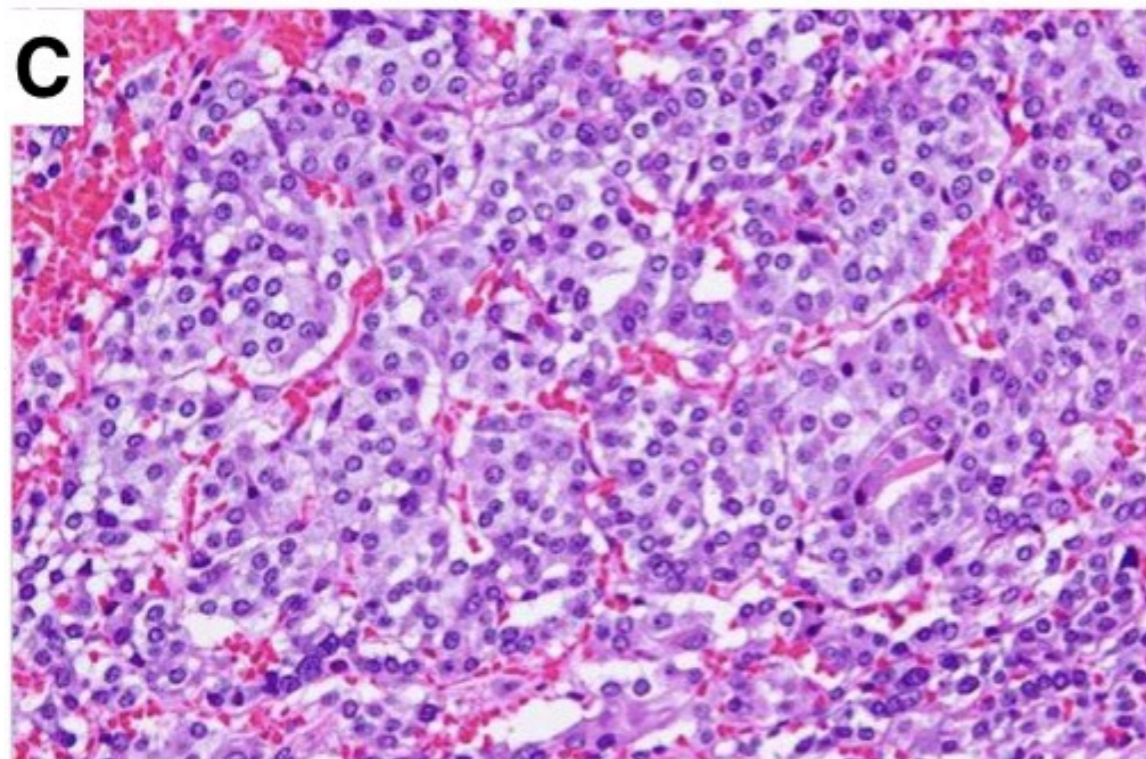
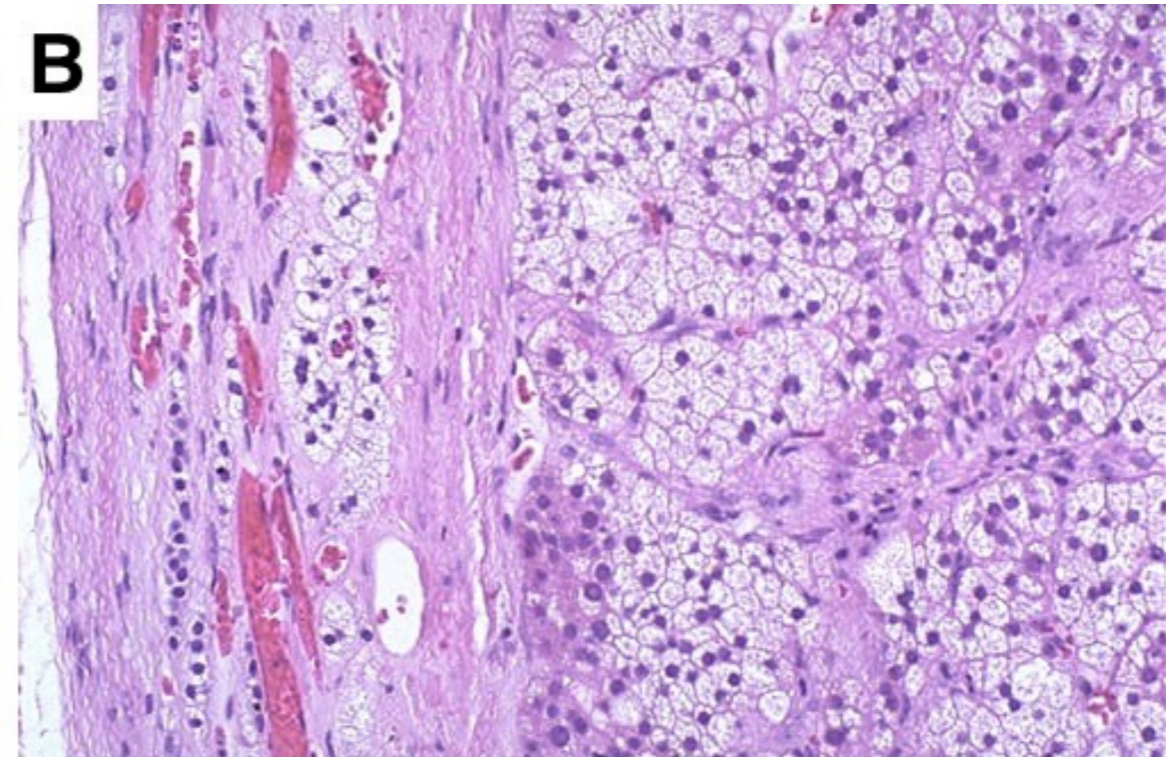
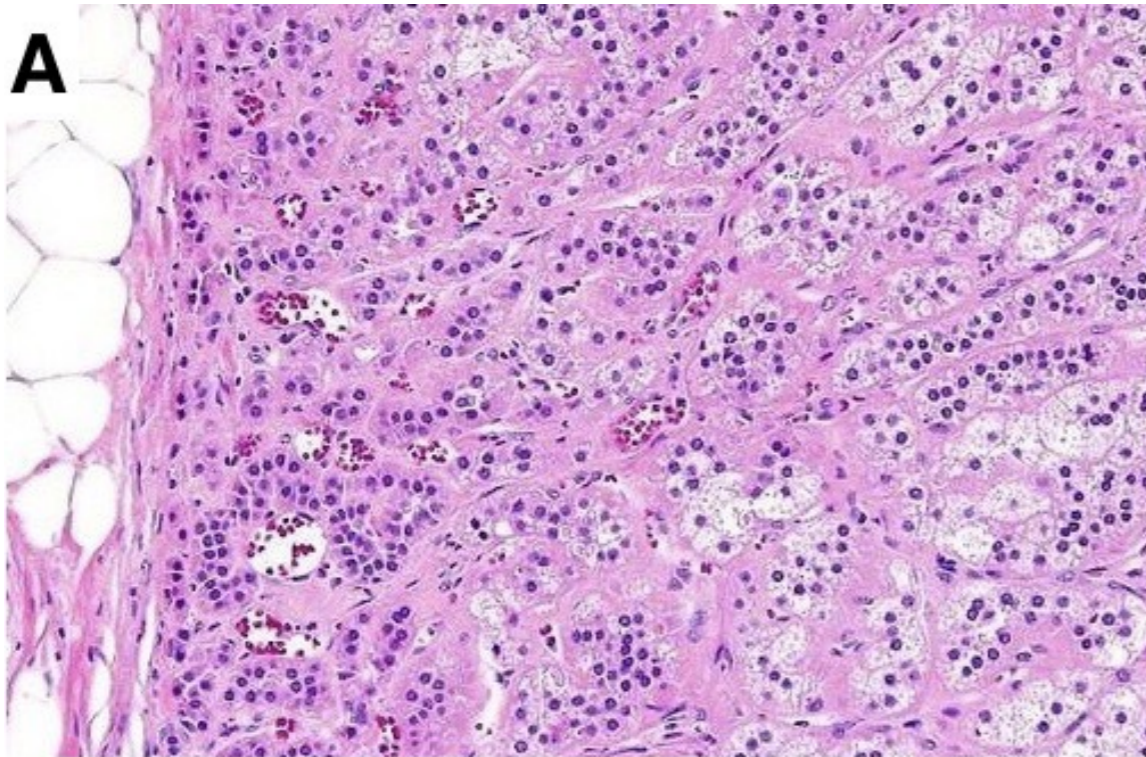
Anterior Pituitary



Which of the images below of the adrenal gland best matches the pituitary biopsy?

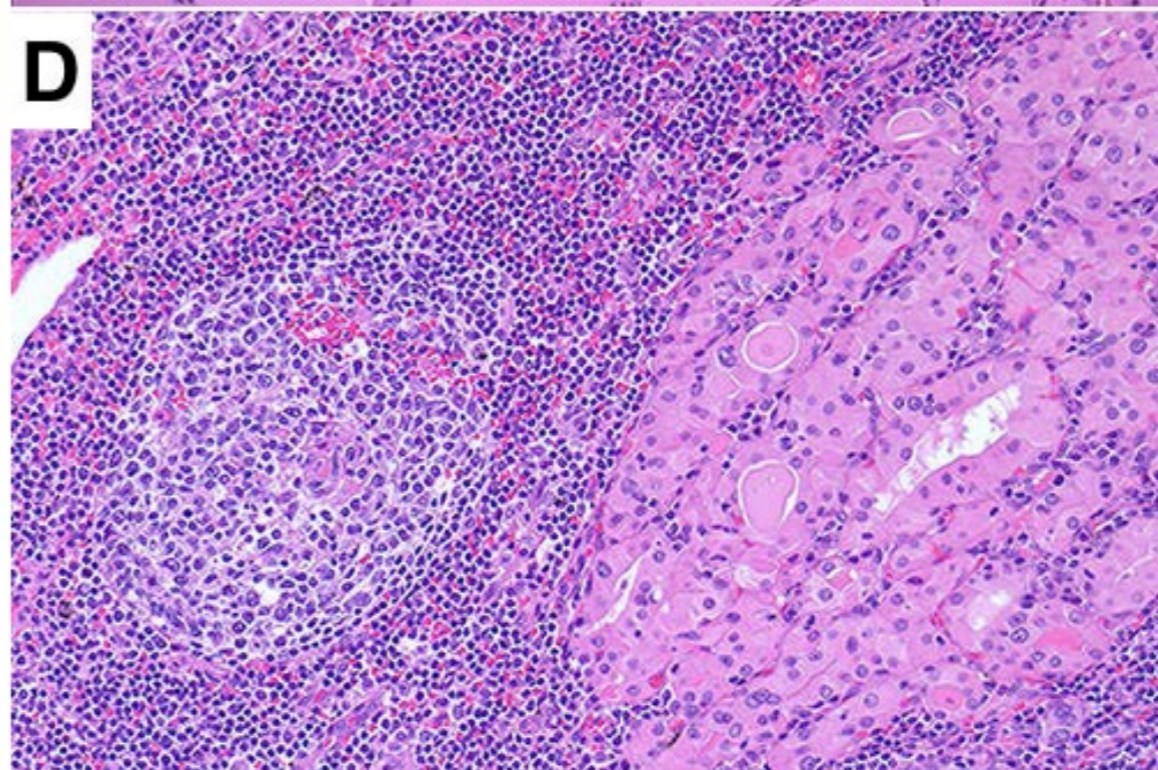
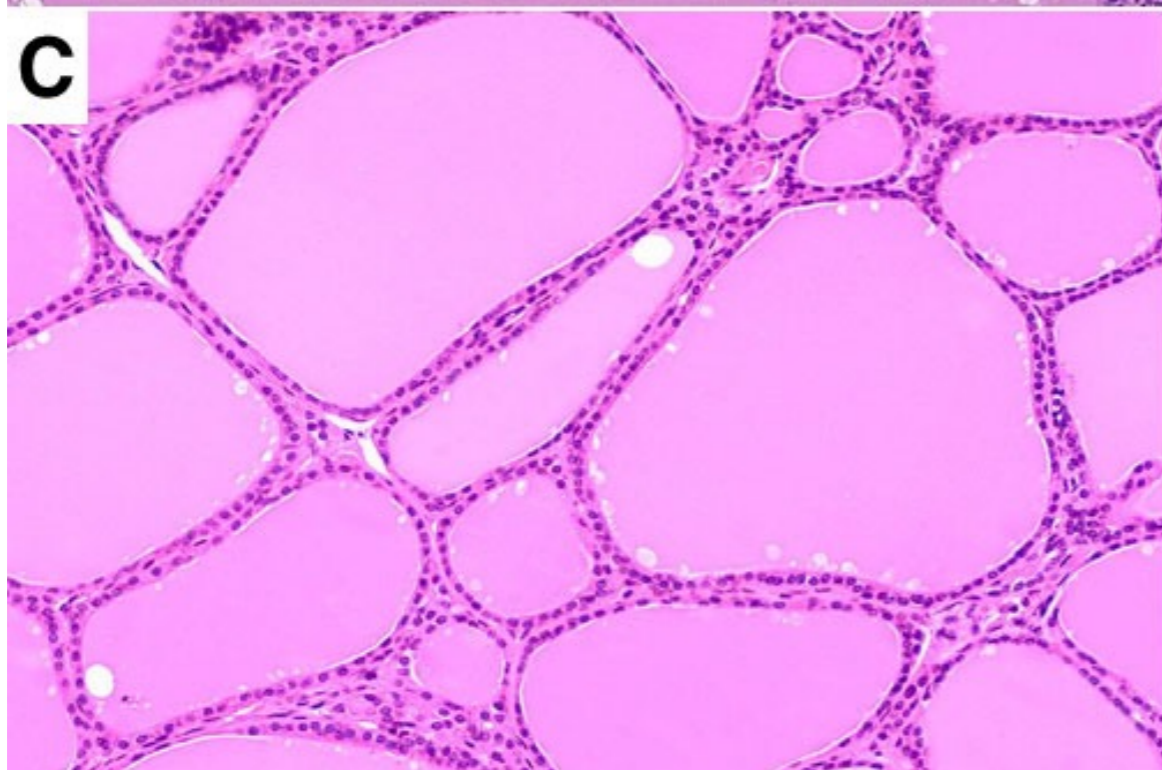
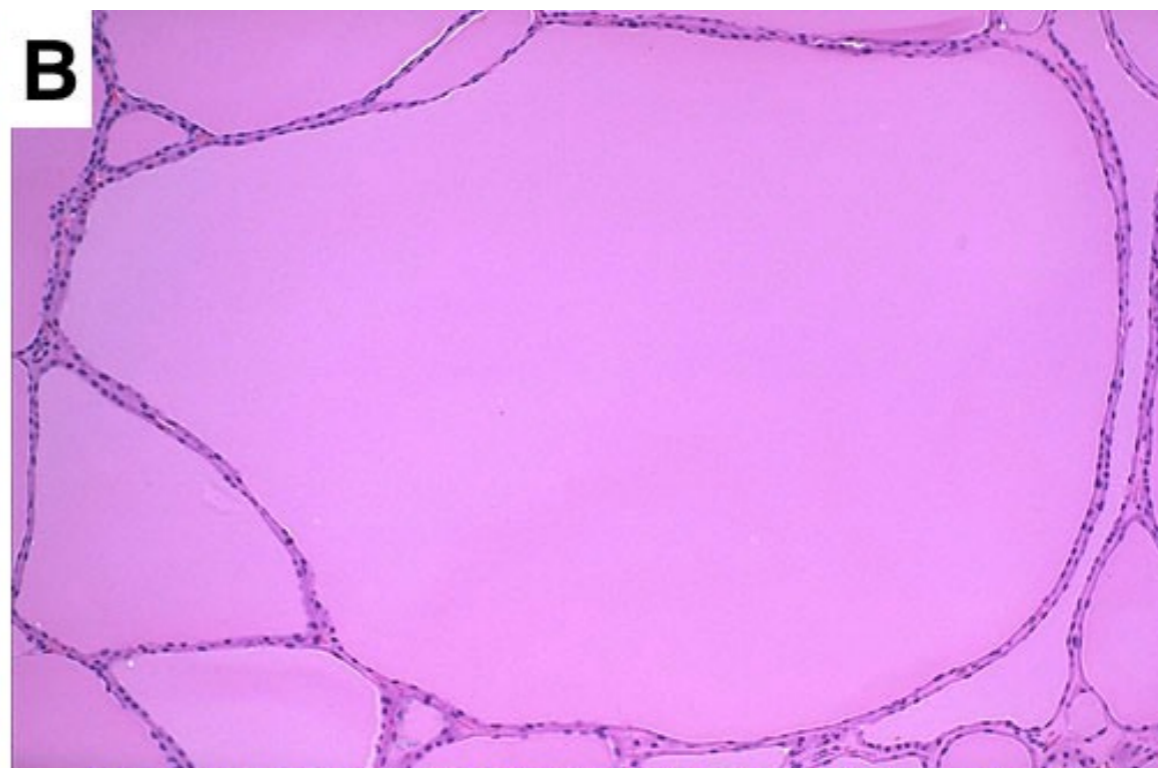
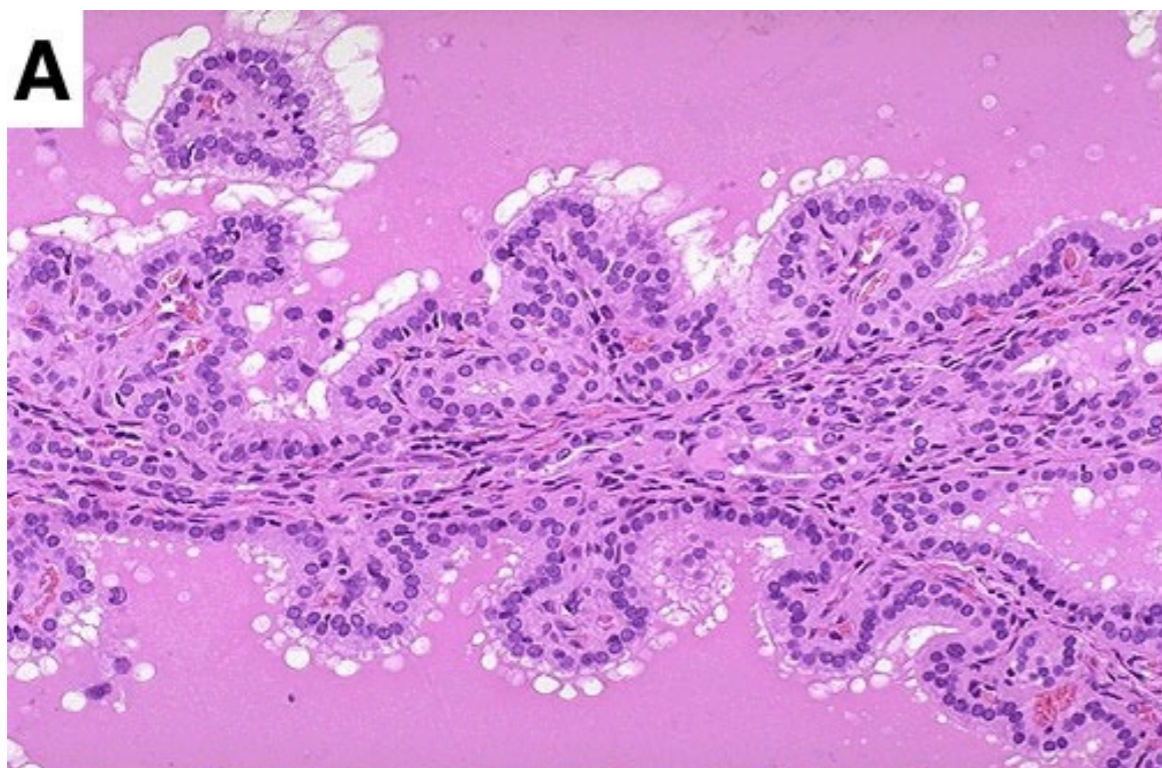
Why does the patients have hypertension and elevated serum glucose?

Are there other causes that could generate similar changes in the adrenal gland?



A patient presents with progressive weight loss despite reporting an increase in appetite. During the interview, the patient reports perspiring more and feeling less tolerant of heat. A physical exam reveals palpitations and the patient's blood work detects below normal levels of TSH.

- Which of the images below of the thyroid best matches the patient's symptoms?
- Why are the patient's TSH levels low?
- What explains the patient's weight loss and feeling hot?
- What are some potential causes that lead to the changes in the thyroid?



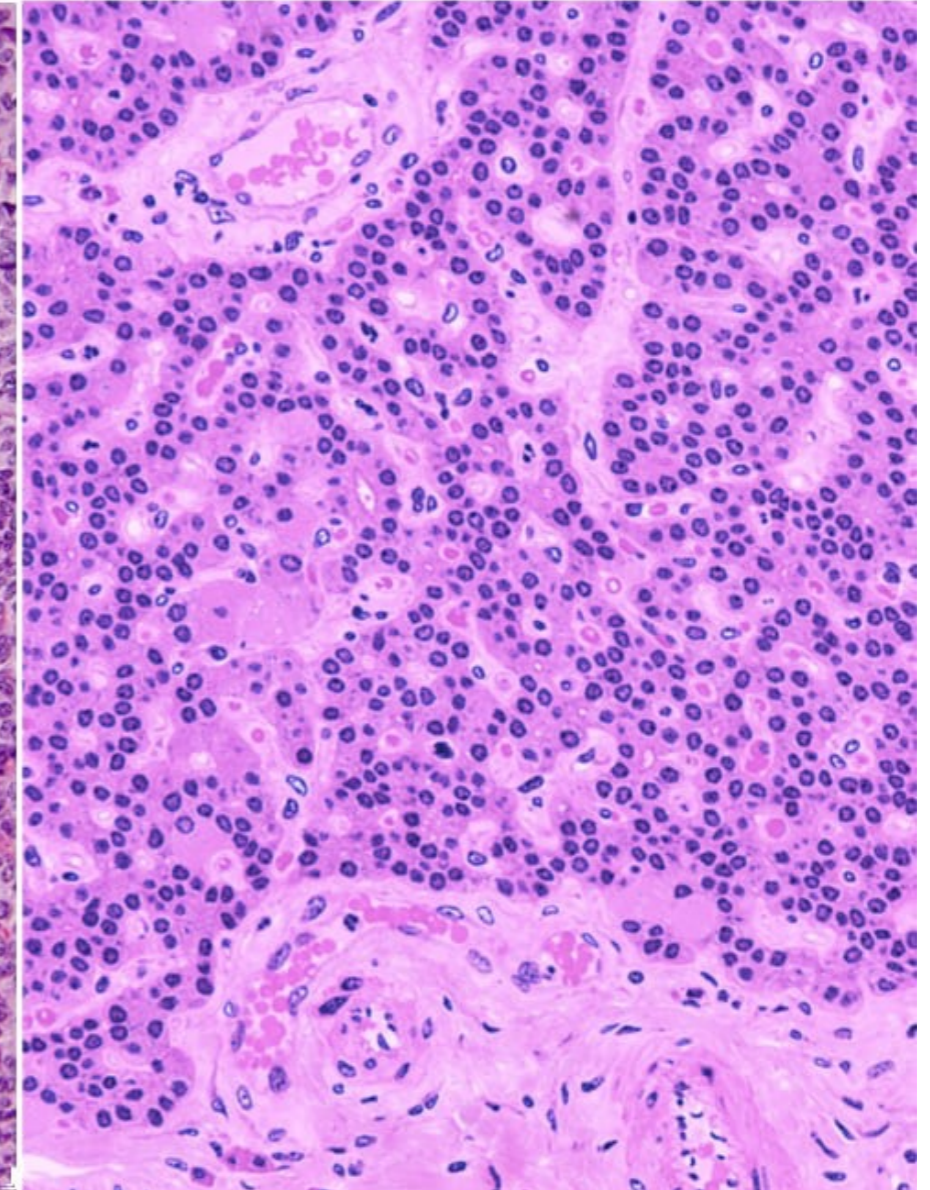
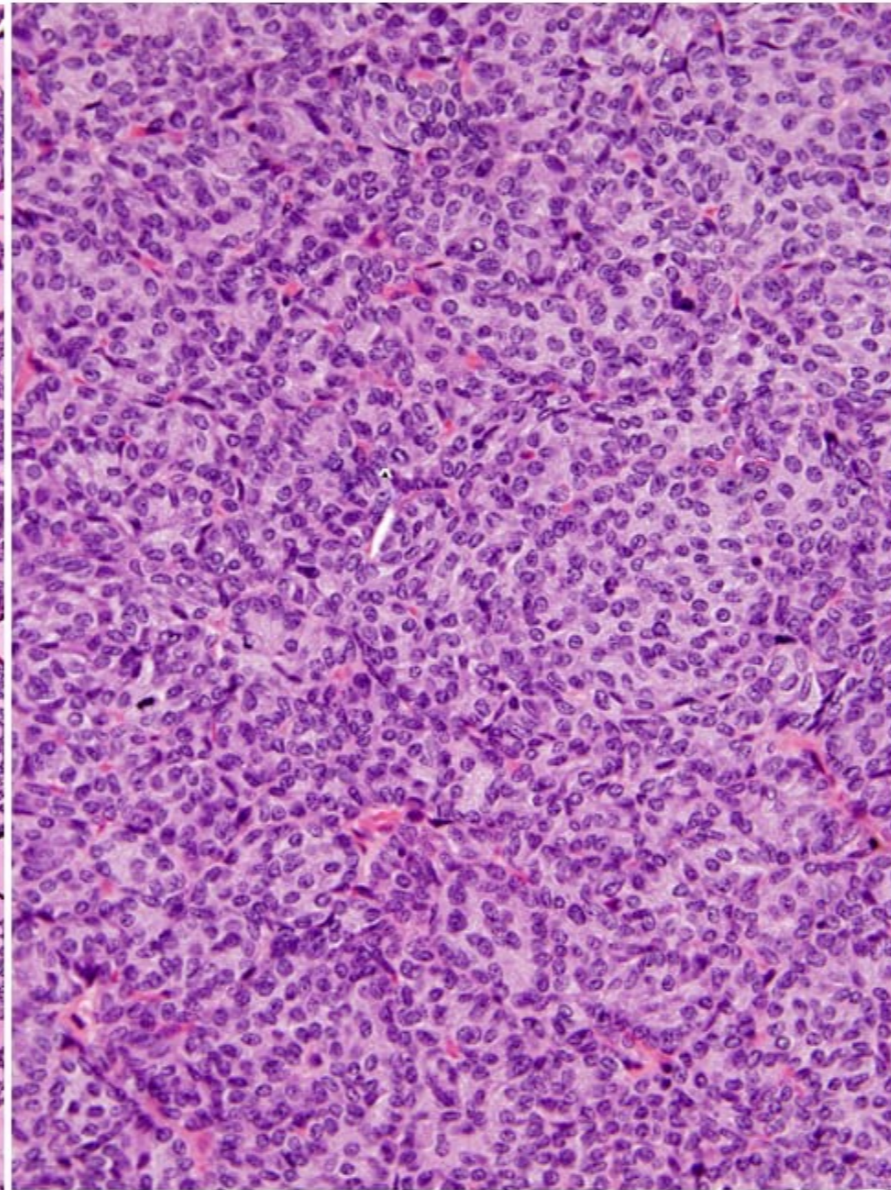
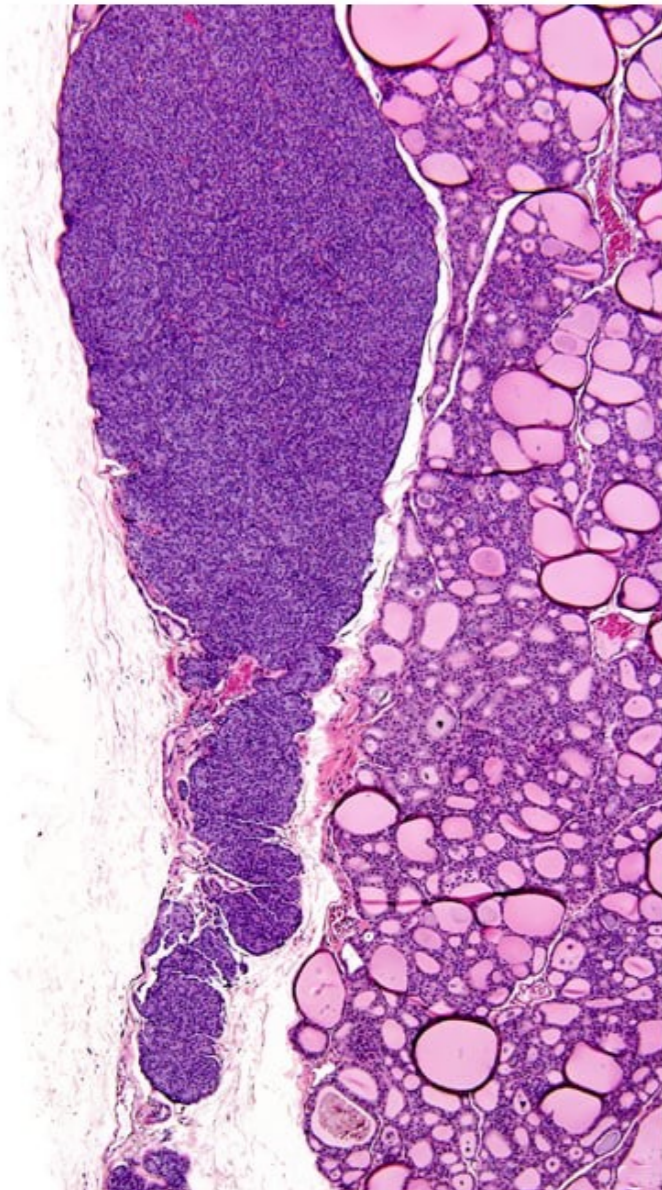
A patient presents with burning stomach pain that is occasionally relieved by eating. A blood test reveals hypercalcemia and hypoglycemia. PTH levels are also above normal.

A biopsy of the parathyroid gland is shown below. Describe the structural changes

Genetic tests show a partial deletion of one allele of the MEN1 (multiple endocrine neoplasia) gene and a nonsense mutation in the other allele. What function does the Men1 protein perform?

Which other organs might also show cellular and/or structural changes? How do they lead to some of the patient's symptoms?

Biopsy



Normal

A patient presents with a lump in their neck but is otherwise asymptomatic.

A biopsy of the thyroid gland is shown below at medium and high magnification. Describe the structural changes and cellular changes you observe.

What biochemical test would be helpful to diagnose the cause of the histological change?

A genetic test reveals a mutation in the RET7 gene. Which disease might you find in the patient's history?

