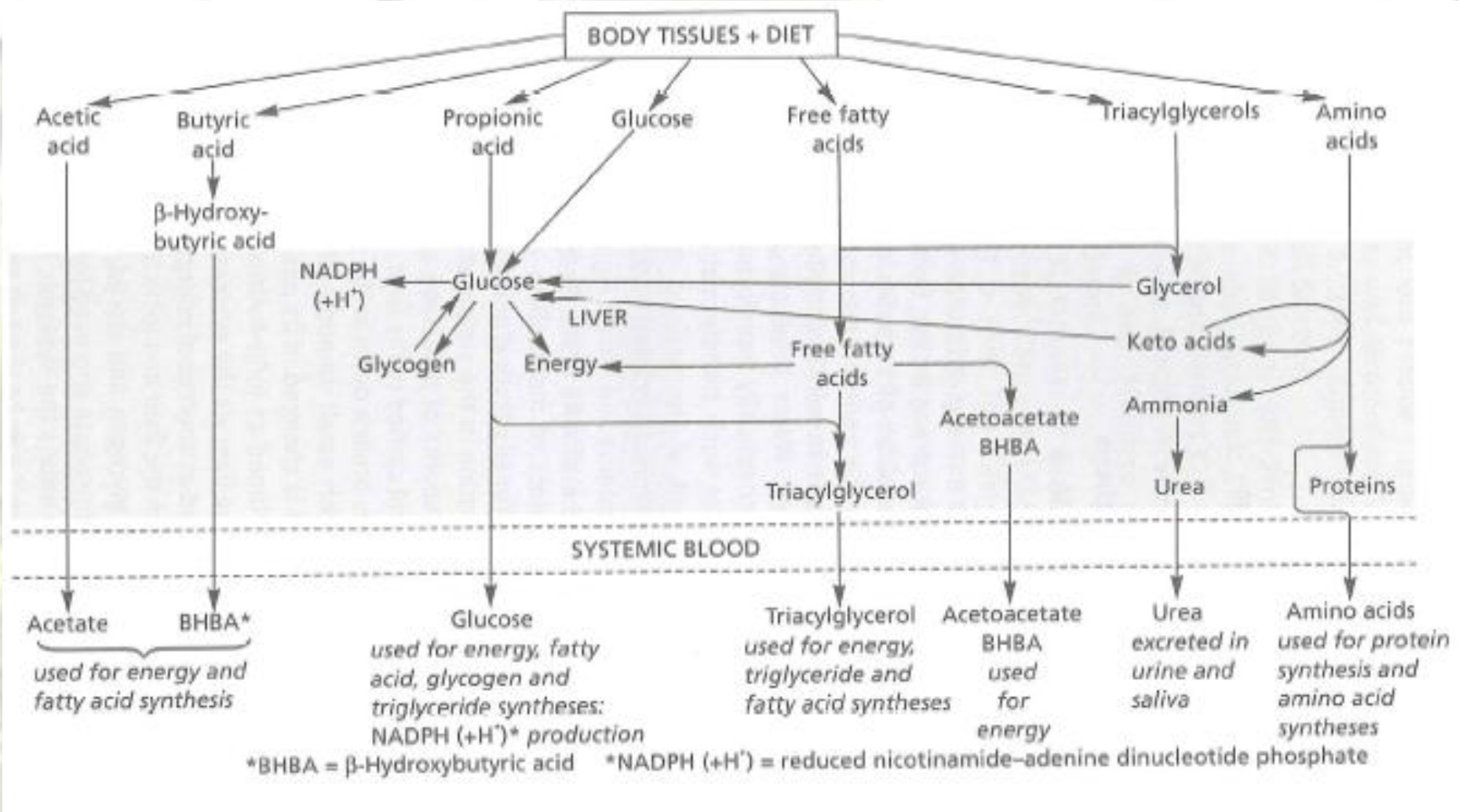
KeyPoint Metabolic Physiology

Fuel for Life: Metabolism and energy balance

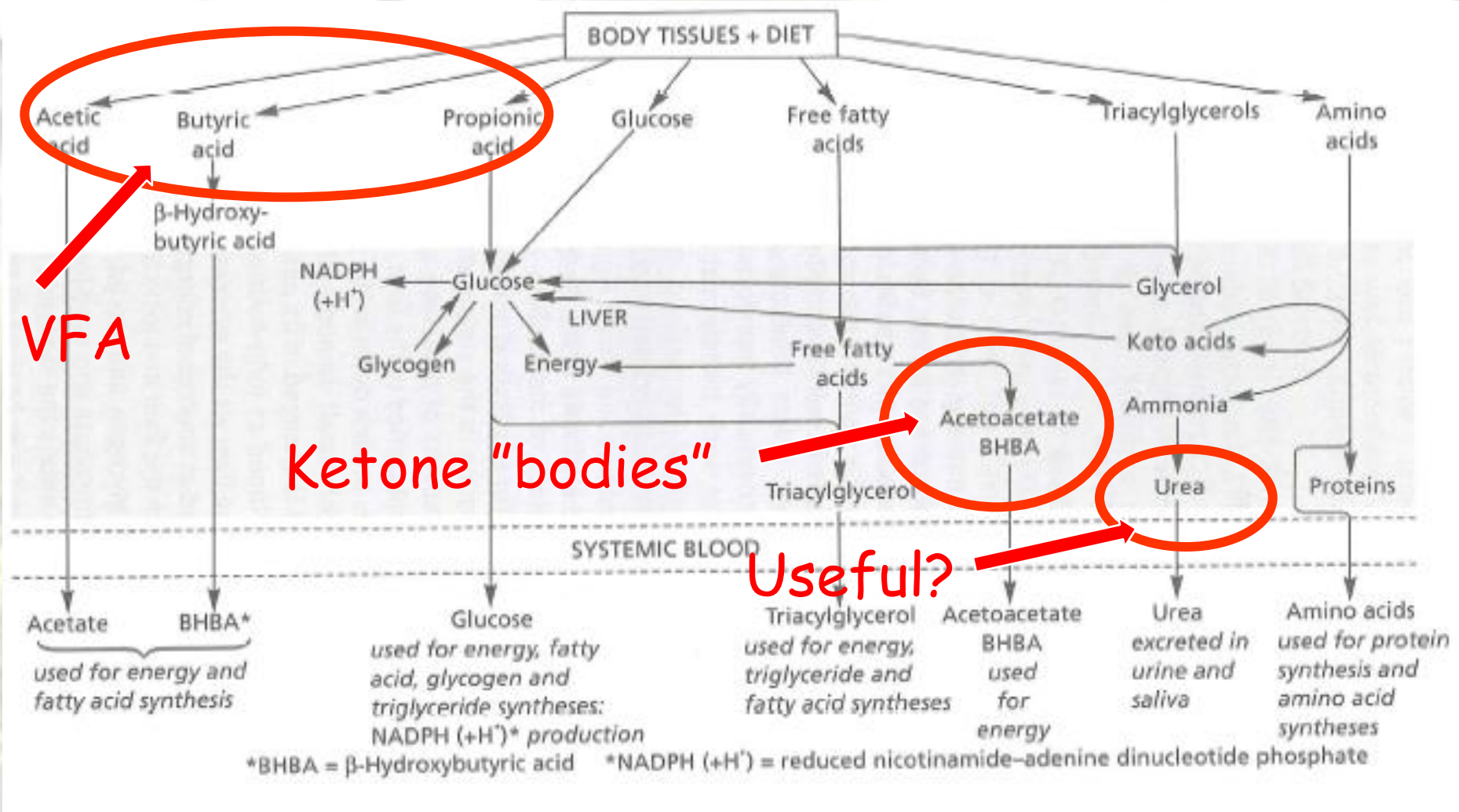
Overview of metabolism

You do NOT need to memorize all of this!

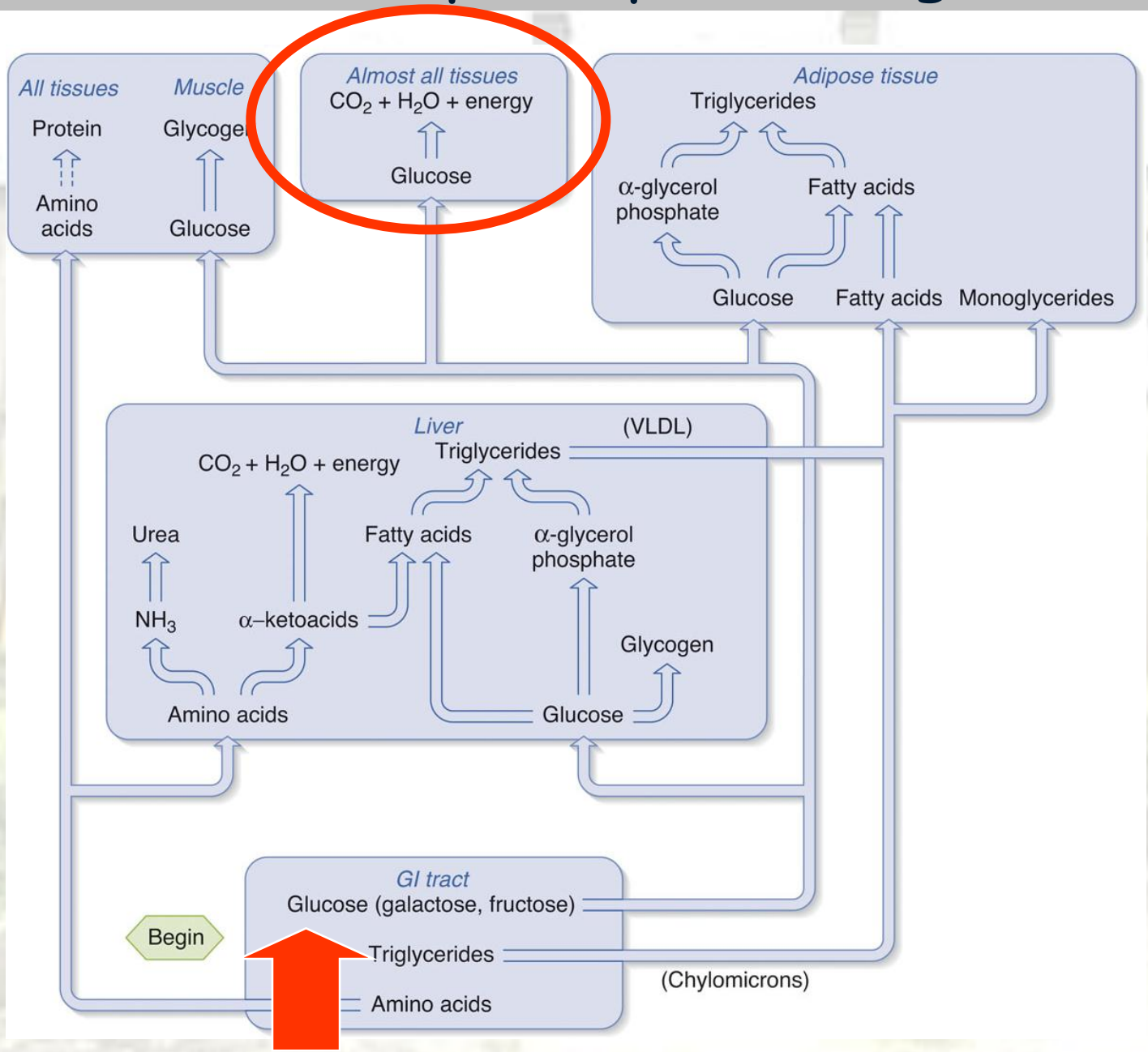


Overview of metabolism

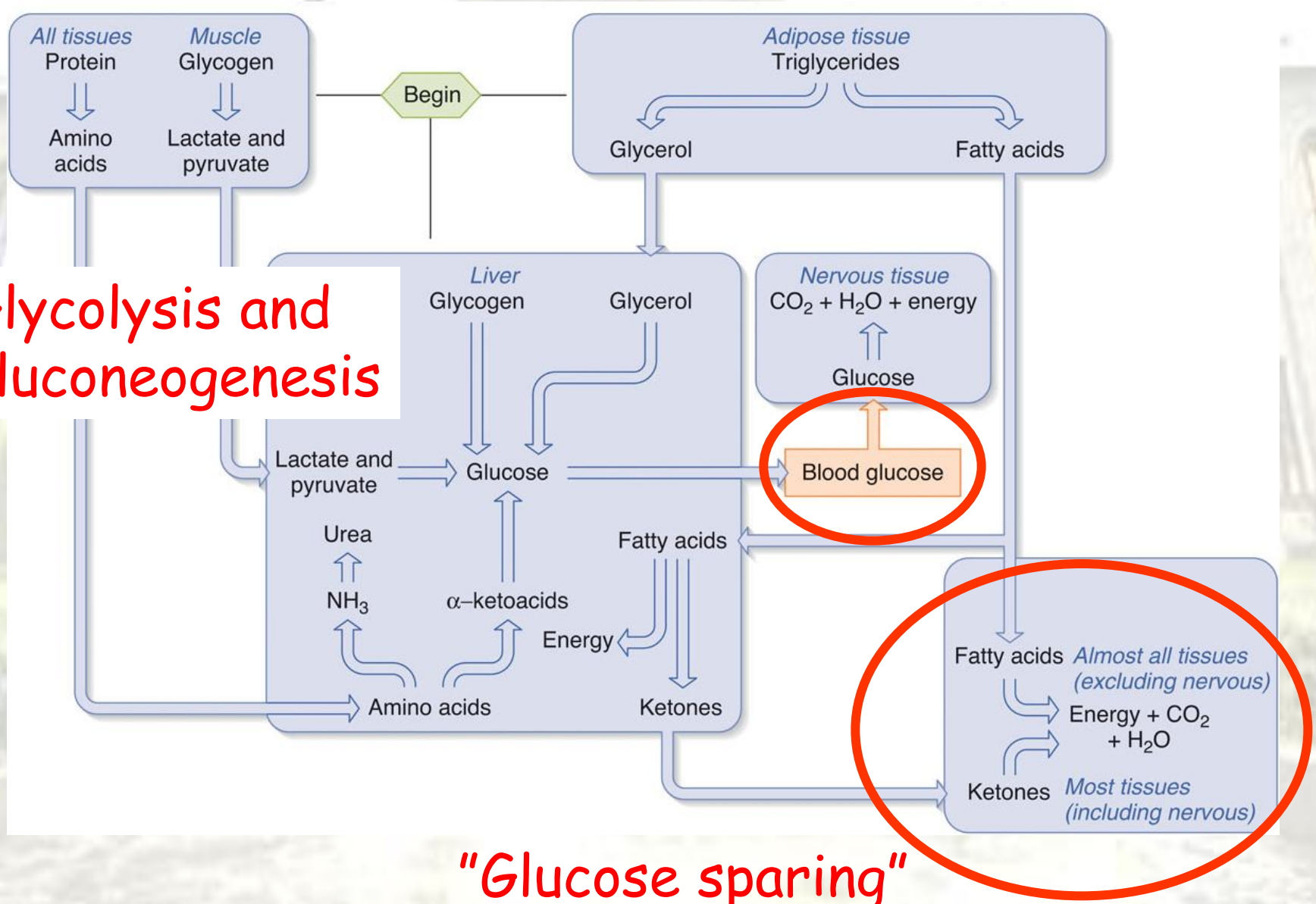
You do NOT need to memorize all of this!



Absorptive phase (digestion)



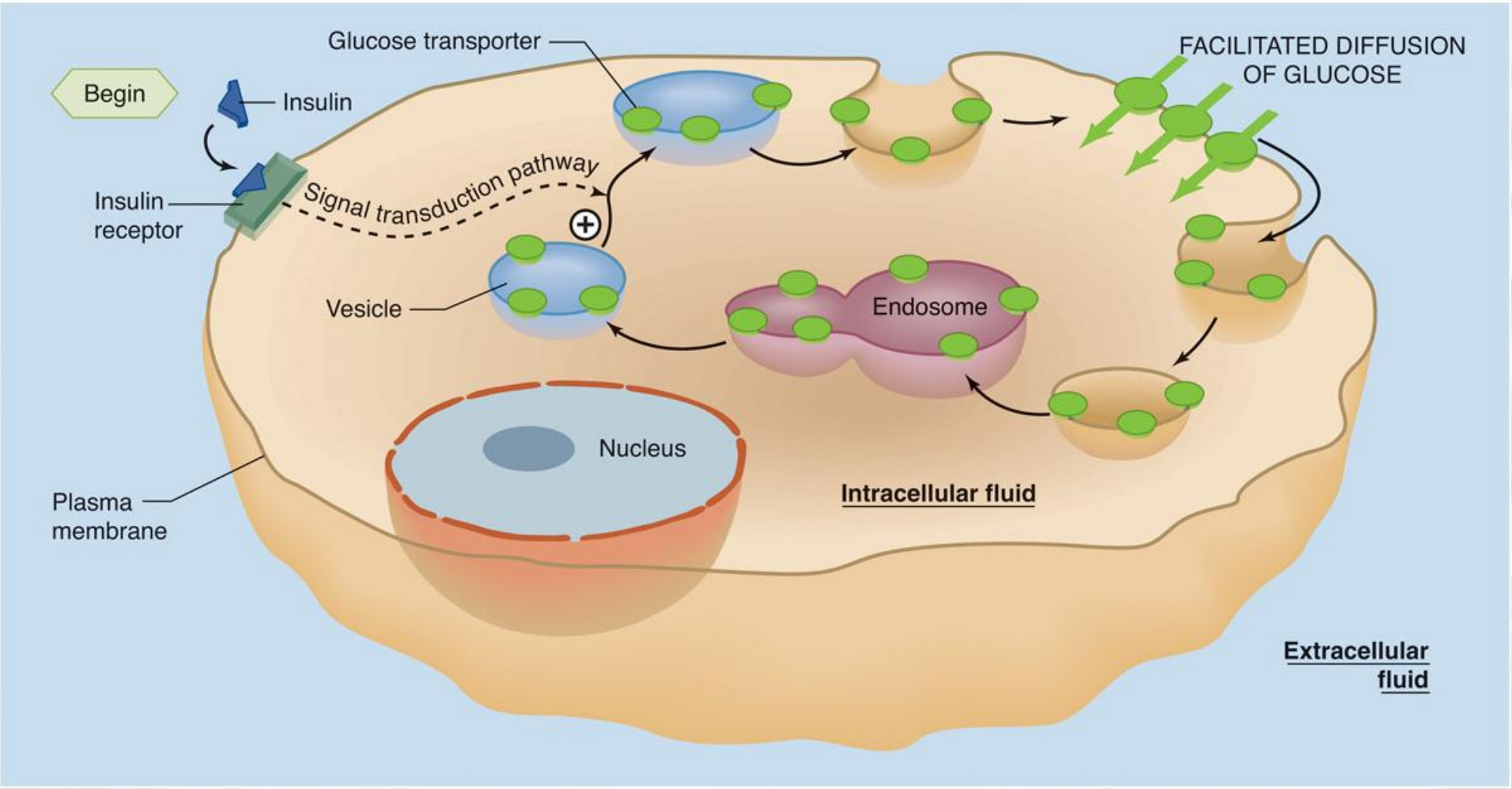
Post-absorptive phase (mobilisation)



Glycolysis and gluconeogenesis

"Glucose sparing"

Insulin regulates glucose uptake by muscle and adipose tissues



Summary of other metabolic hormones

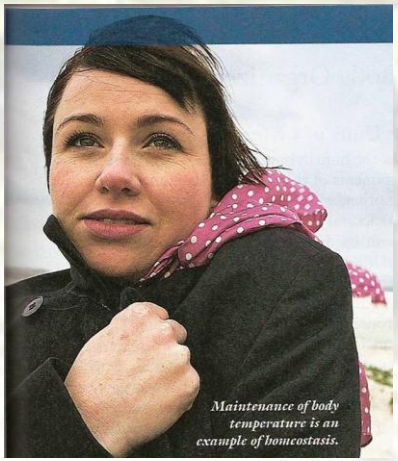
Table 16–4 Summary of Glucose-Counterregulatory Controls*

	Glucagon	Epinephrine	Cortisol	Growth Hormone
Glycogenolysis	✓	✓		
Gluconeogenesis	✓	✓	✓	✓
Lipolysis		✓	✓	✓
Inhibition of glucose uptake by muscle cells and adipose tissue cells			✓	✓

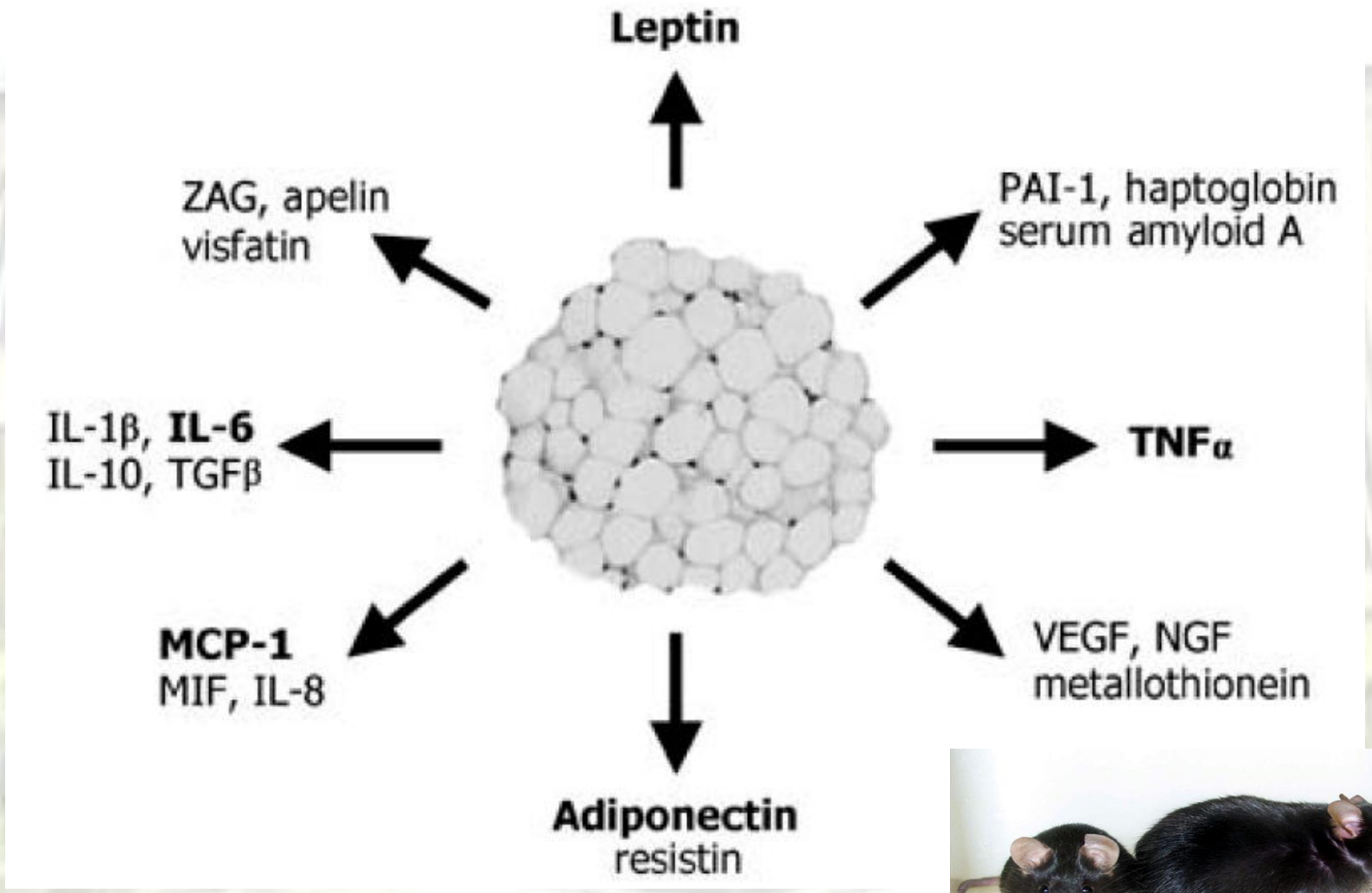
*A ✓ indicates that the hormone stimulates the process; no ✓ indicates that the hormone has no major physiological effect on the process. Epinephrine stimulates glycogenolysis in both liver and skeletal muscle, whereas glucagon does so only in liver.

Thyroid hormones regulate Basal Metabolic Rate (BMR)

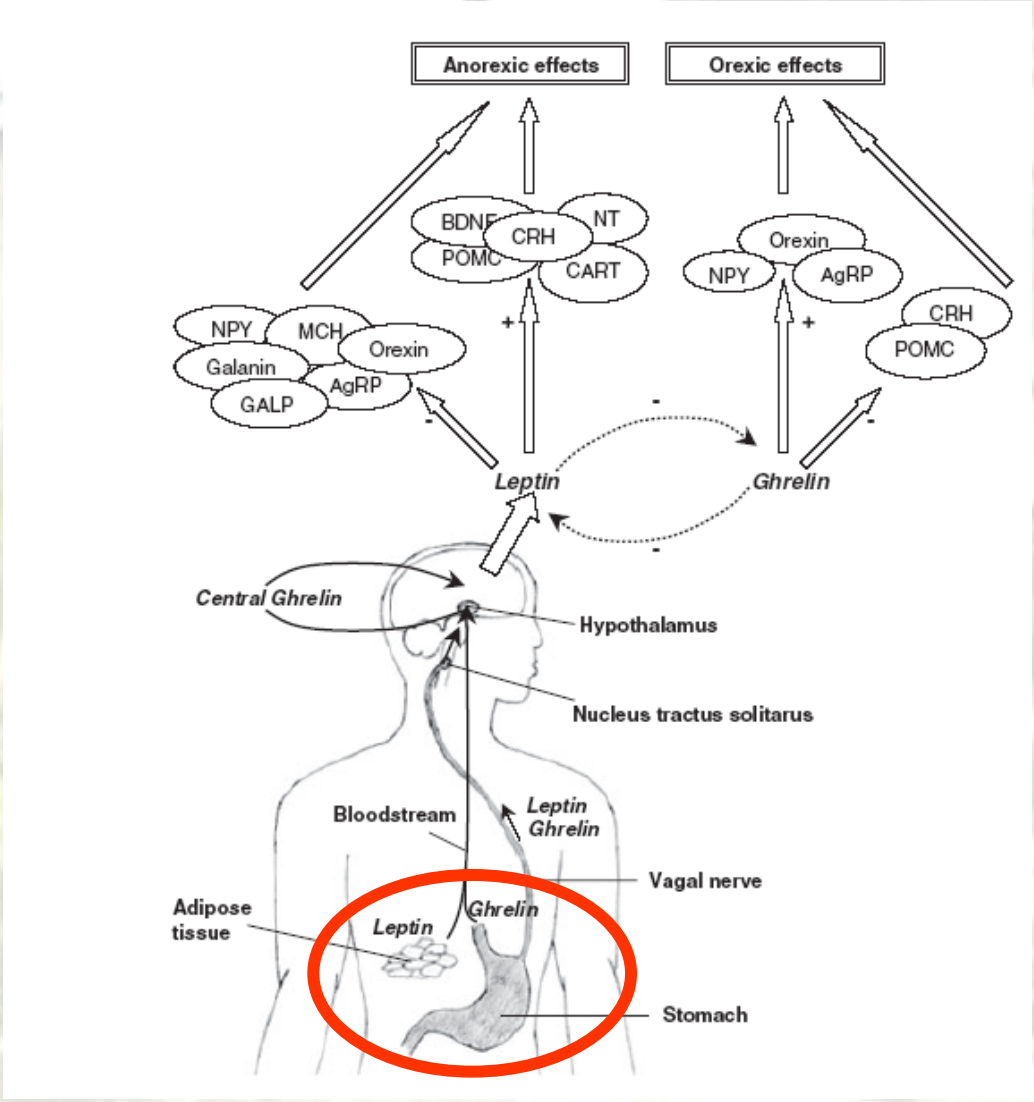
Energy metabolism and thermoregulation are interrelated



Metabolic adipokines

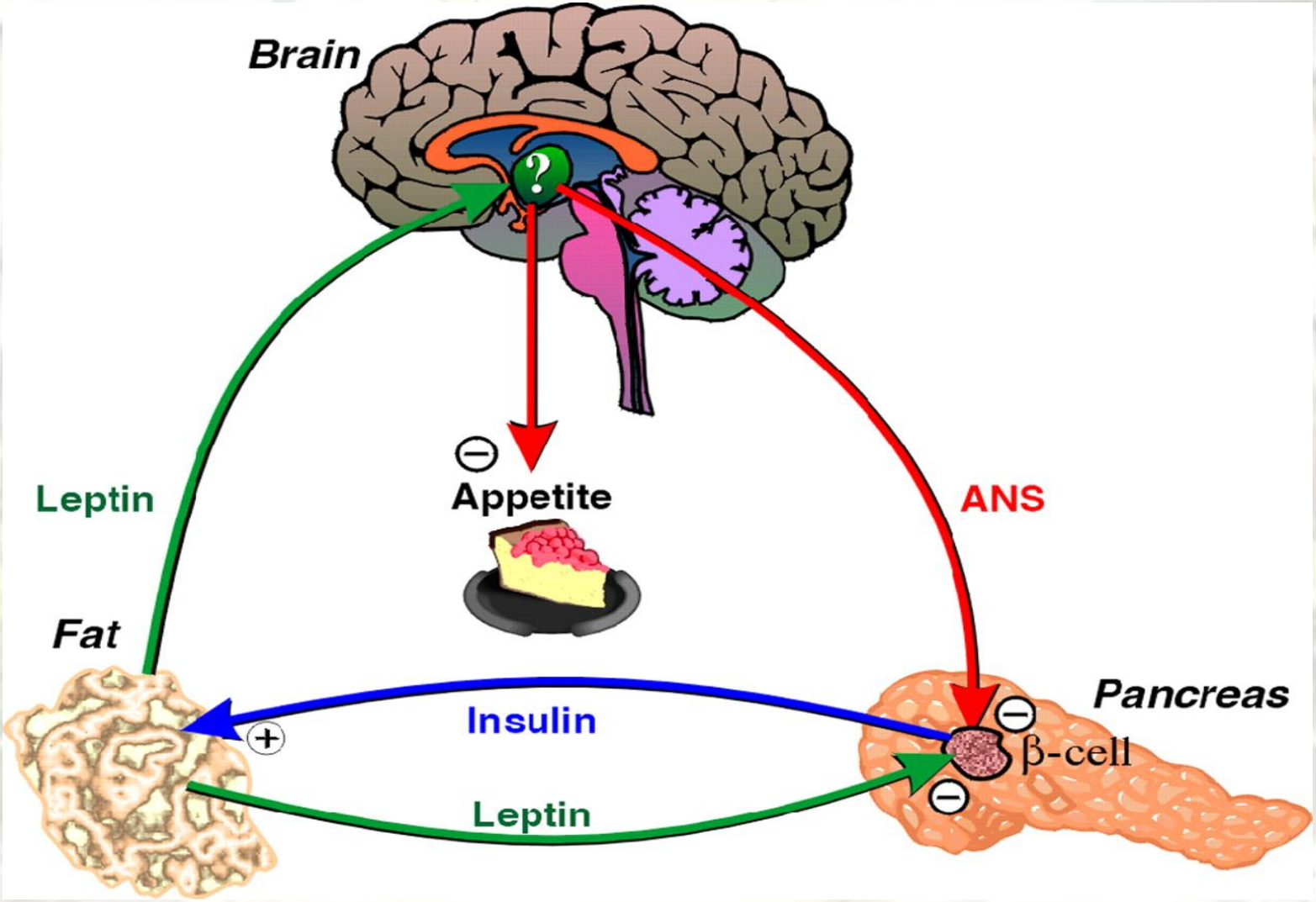


Metabolism and Appetitie

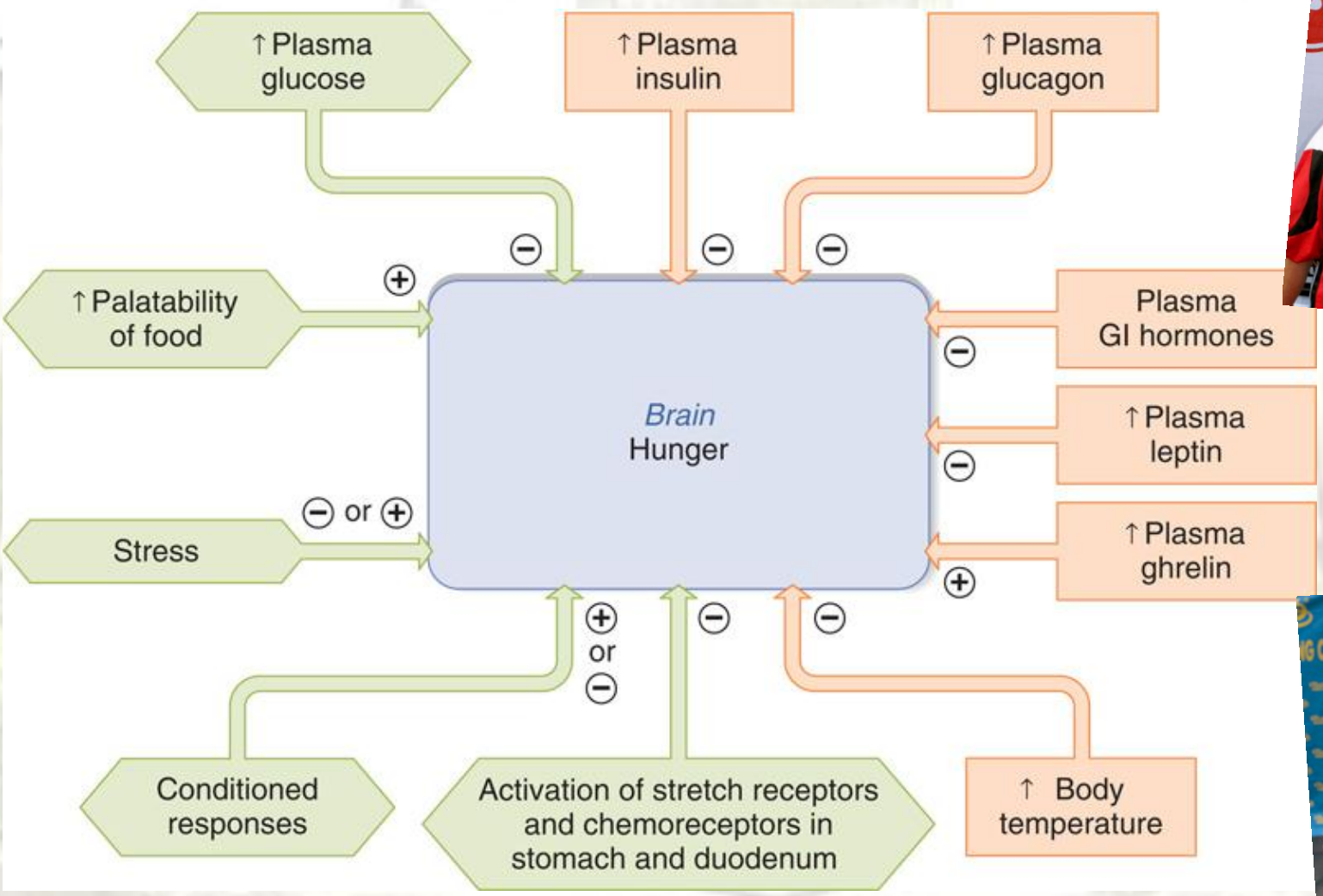


Leptin: anorexic
Ghrelin: orexic

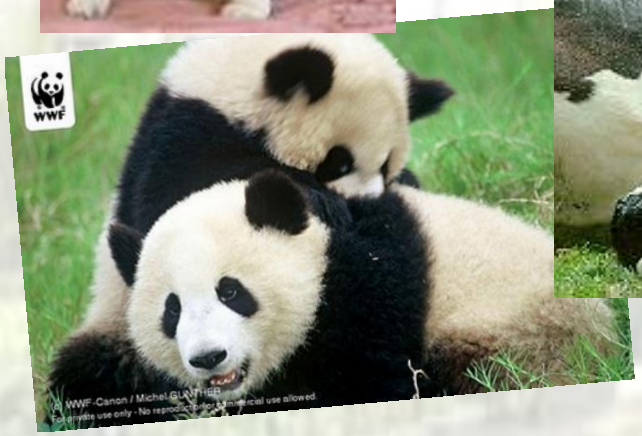
Metabolism and Appetitie



But we still don't understand hunger!



Comparative aspects of digestion and metabolism



- The ability to *deposit* body reserves and then *mobilise* them is essential to meet challenges, which may be:
  - Environmental
  - Physiological
- It is achieved through the processes of digestion, absorption and metabolism