Nutrition

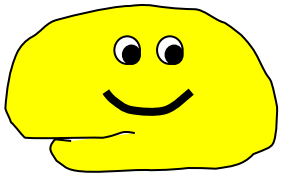
Obesity and starvation

Then the messenger will say: “O my Lord! Truly my people treated this Qur’ān with neglect.”

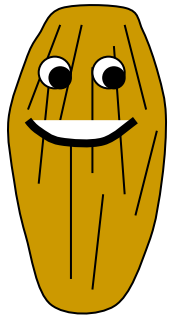
30- Al-Furqan Al Quran

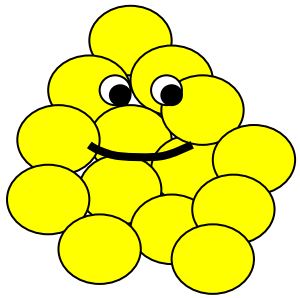
Lecture contents

- Regulation of food intake
- Anthropometric studies
- Body mass index
- Obesity
- Starvation



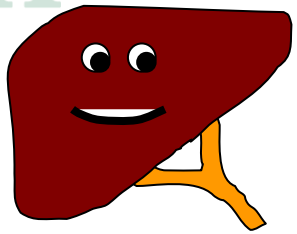
story of sharing and caring!





UNITY IS STRENGTH

UNITY IS STRENGTH



Tale of a family who survived crises!

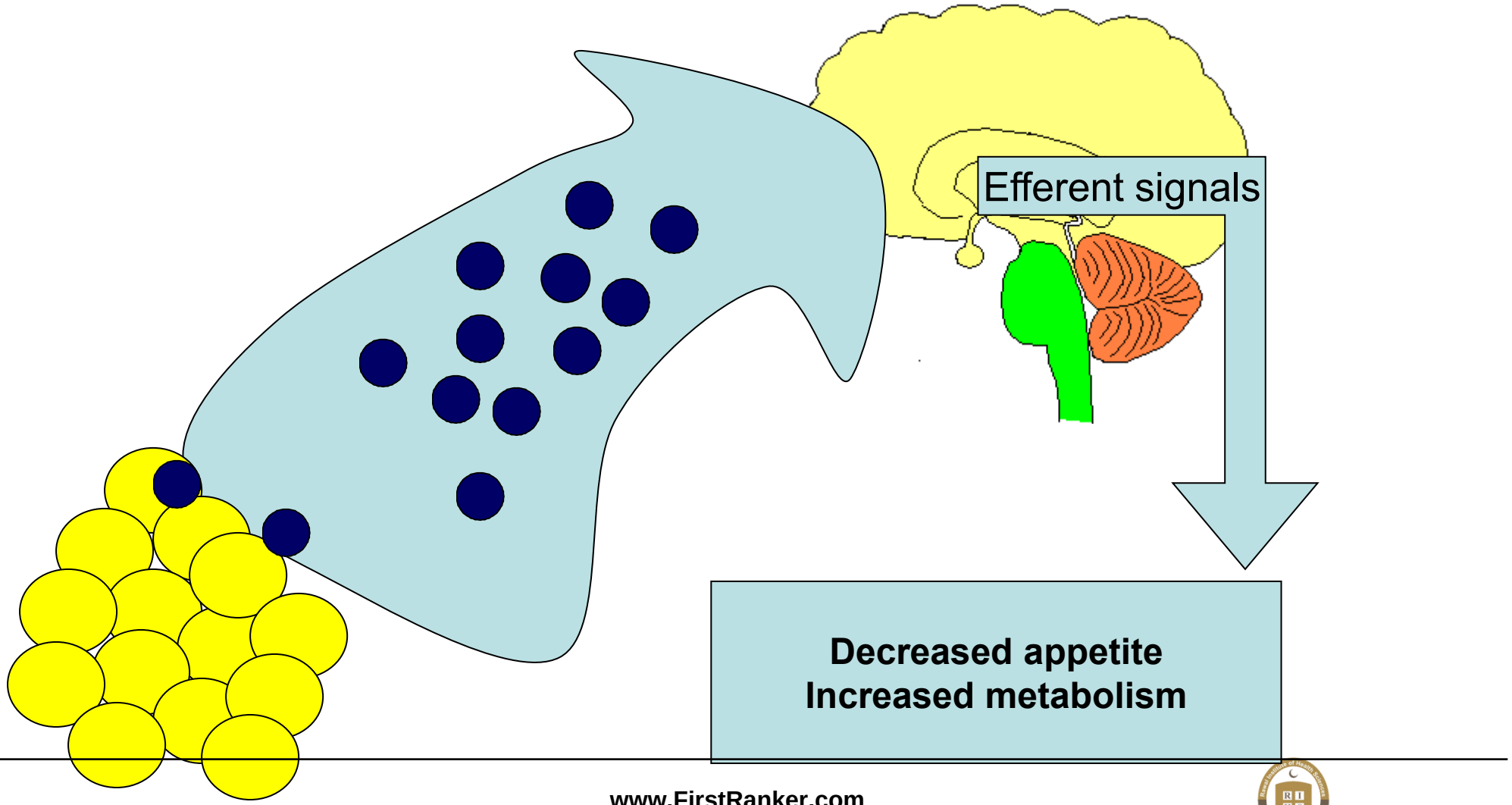
Regulation of food intake

- Hunger center
  - Lateral hypothalamic area
- Satiety center
  - Ventromedial nucleus

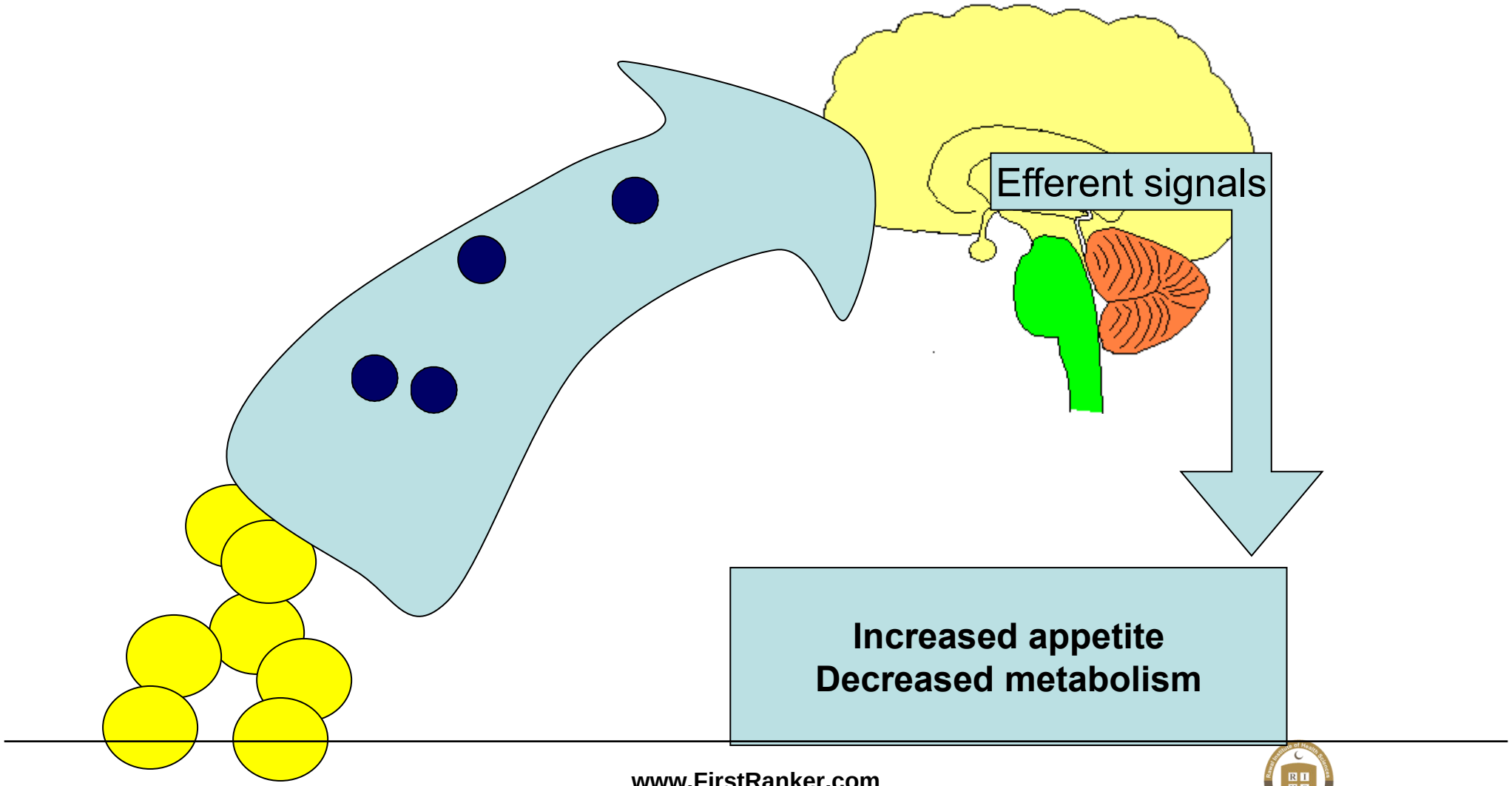
Regulation of food intake

- Hormones that decrease appetite
  - Leptin
  - Adiponectin
  - Resistin
- Hormones that increase appetite
  - Ghrelin

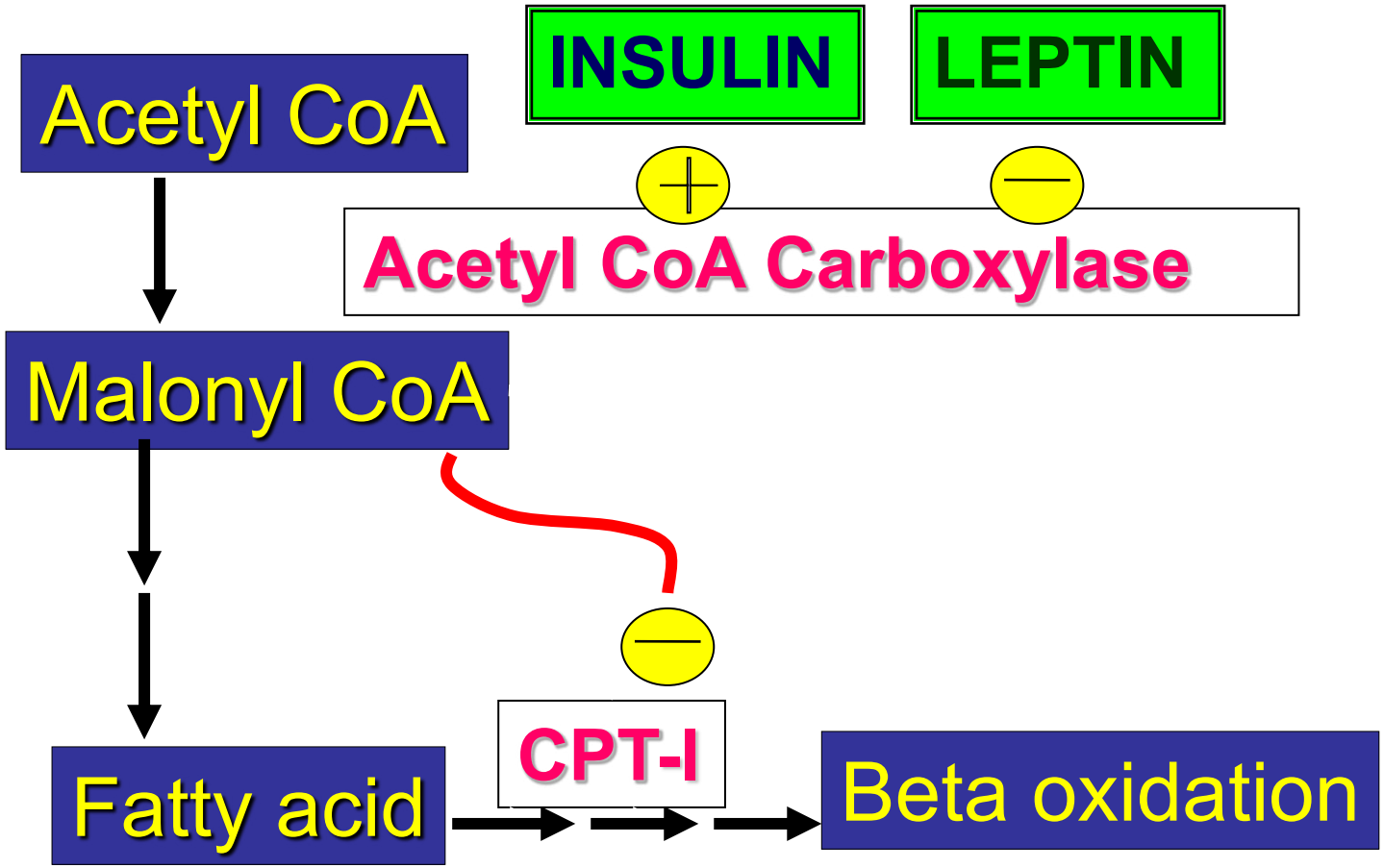
Regulation of food intake



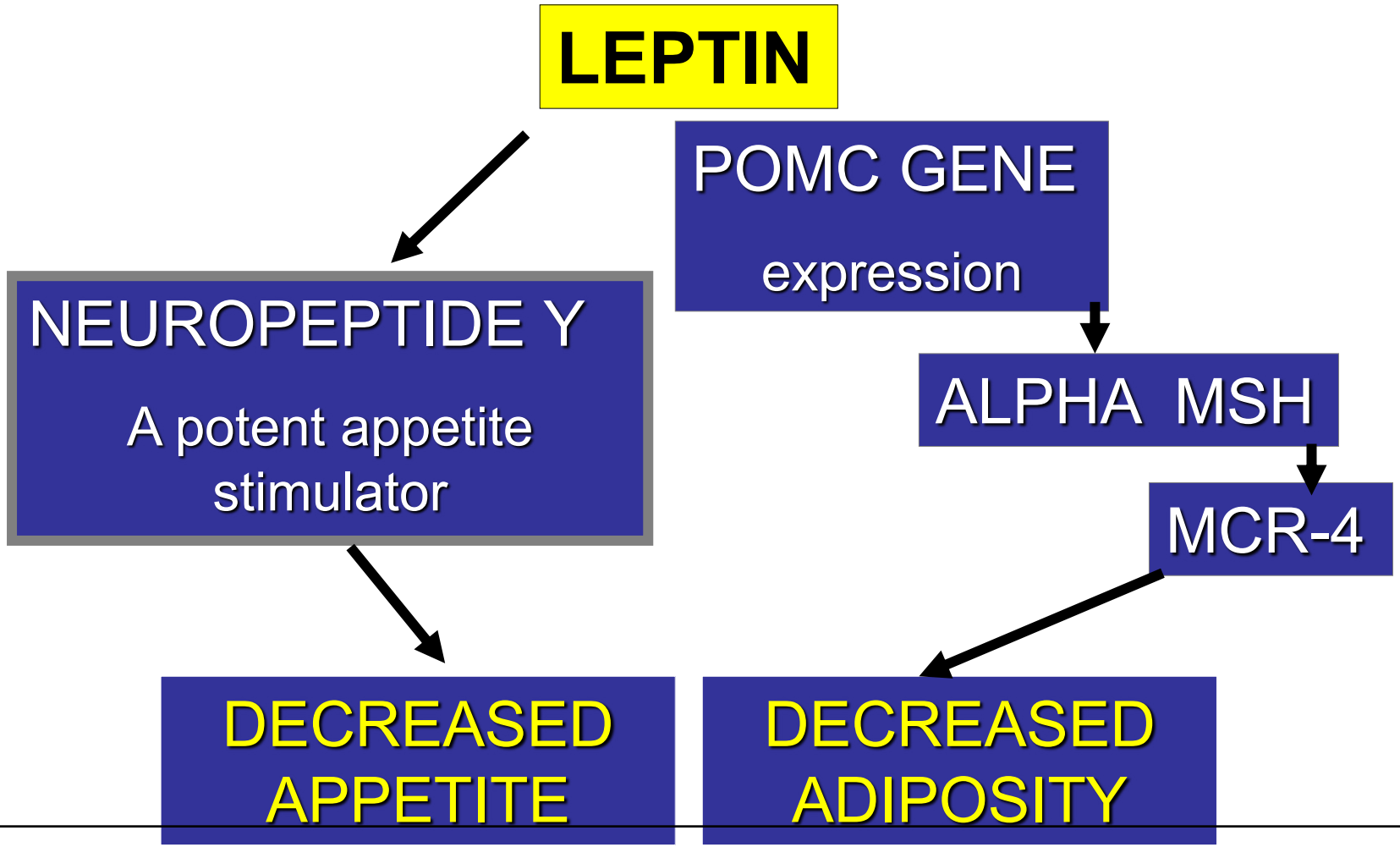
Regulation of food intake



Regulation of food intake



Regulation of food intake



Regulation of food intake

Leptin

Sympathetic nervous system
TRH & TSH

Increased metabolism & thermogenesis

Anthropometric studies

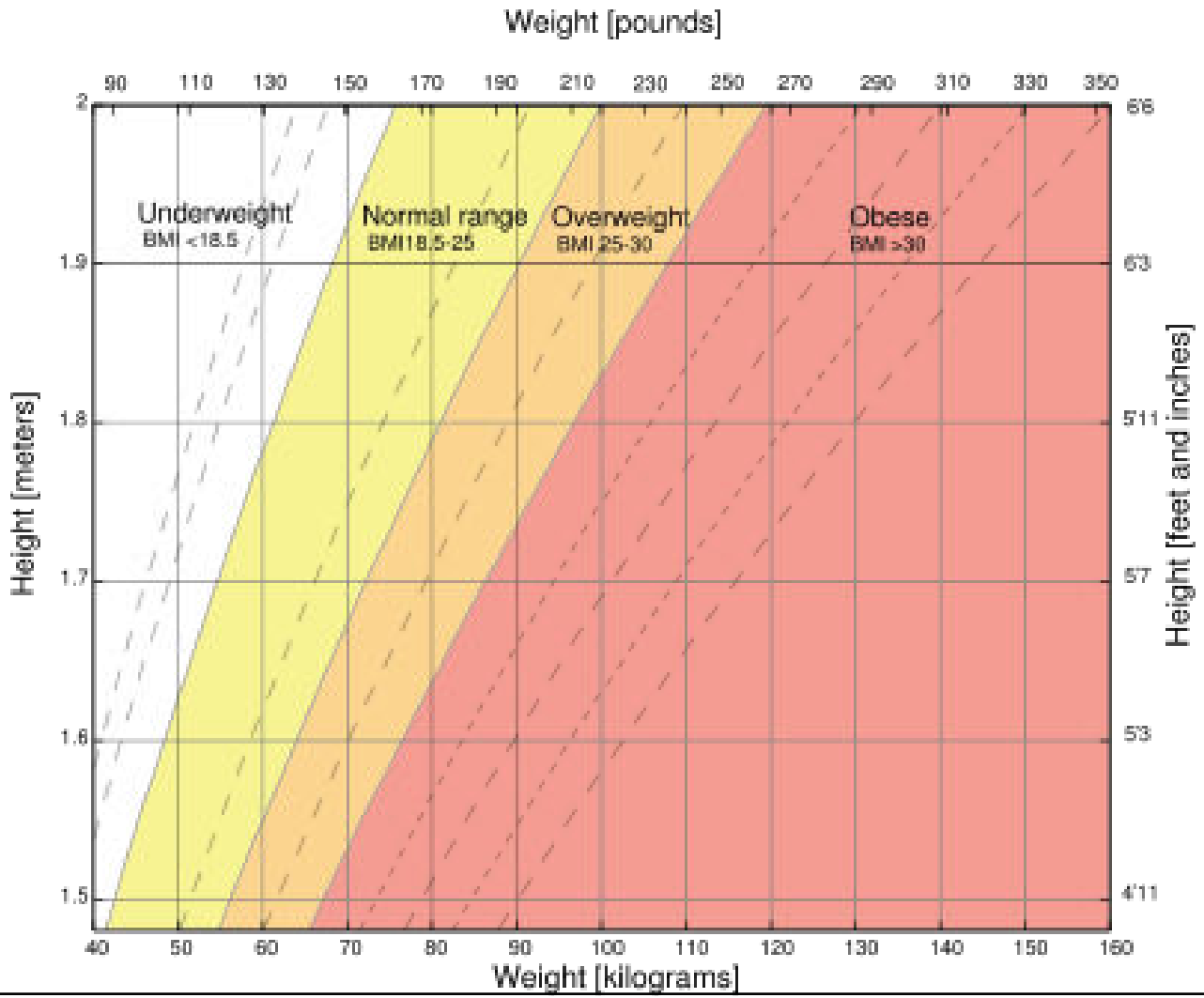
- Height and weight
- Waist hip ratio
- BMI
- Skinfold measurements
- Densitometry
- Ultrasound
- Bioelectrical impedance
- Computed tomography
- Serum albumin level

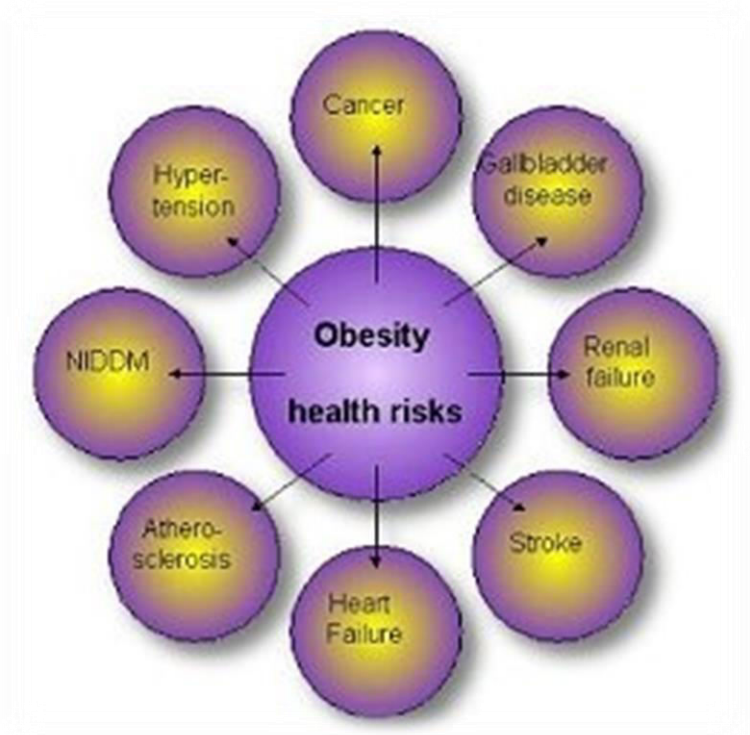
Body mass index

- "Body mass index (BMI) or Quetelet Index is a statistical measure of the weight of a person scaled according to height."

Body Mass Index (BMI) = Weight (kg) / Height (m) ^{2}

BODY MASS INDEX





A silent killer

OBESITY

Man is a creature of haste! Soon will I show you My signs; so ask Me not to hasten.

37- Al Anbiyāa Al Quran

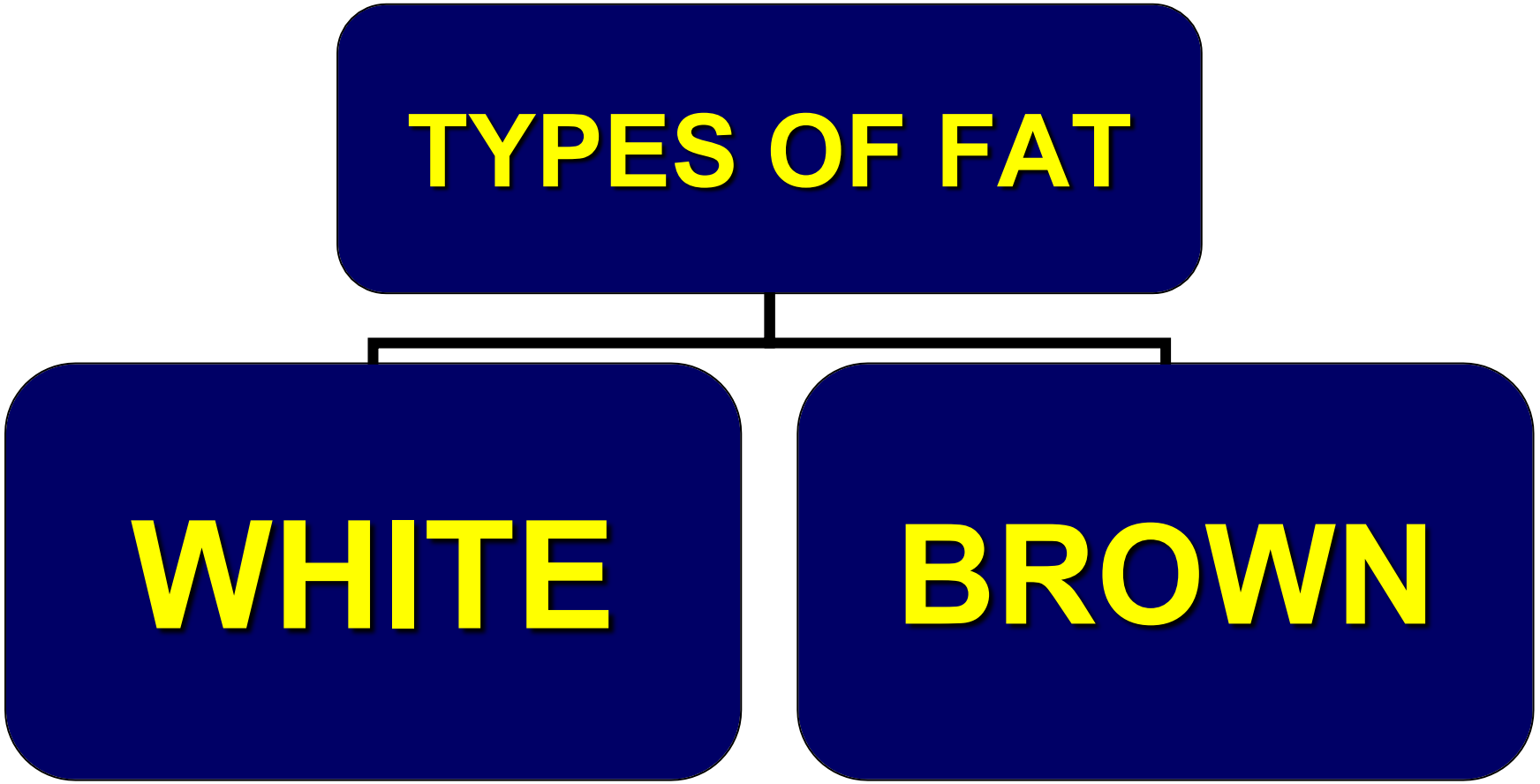
It takes less time and energy to get fast food and it is a lot cheaper.

But don't wait until it is too late

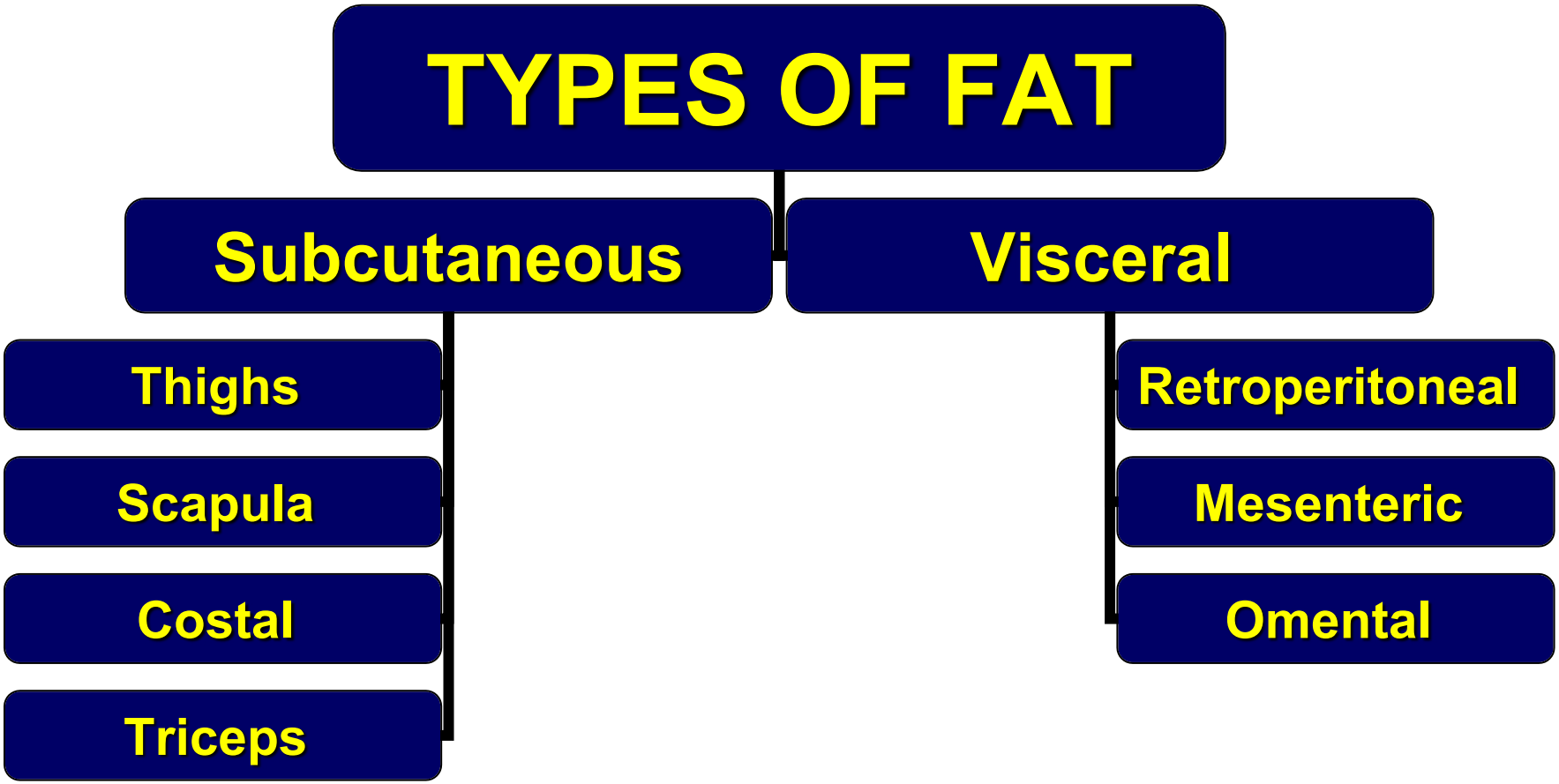
Take action today.

Stay healthy, Eat right.

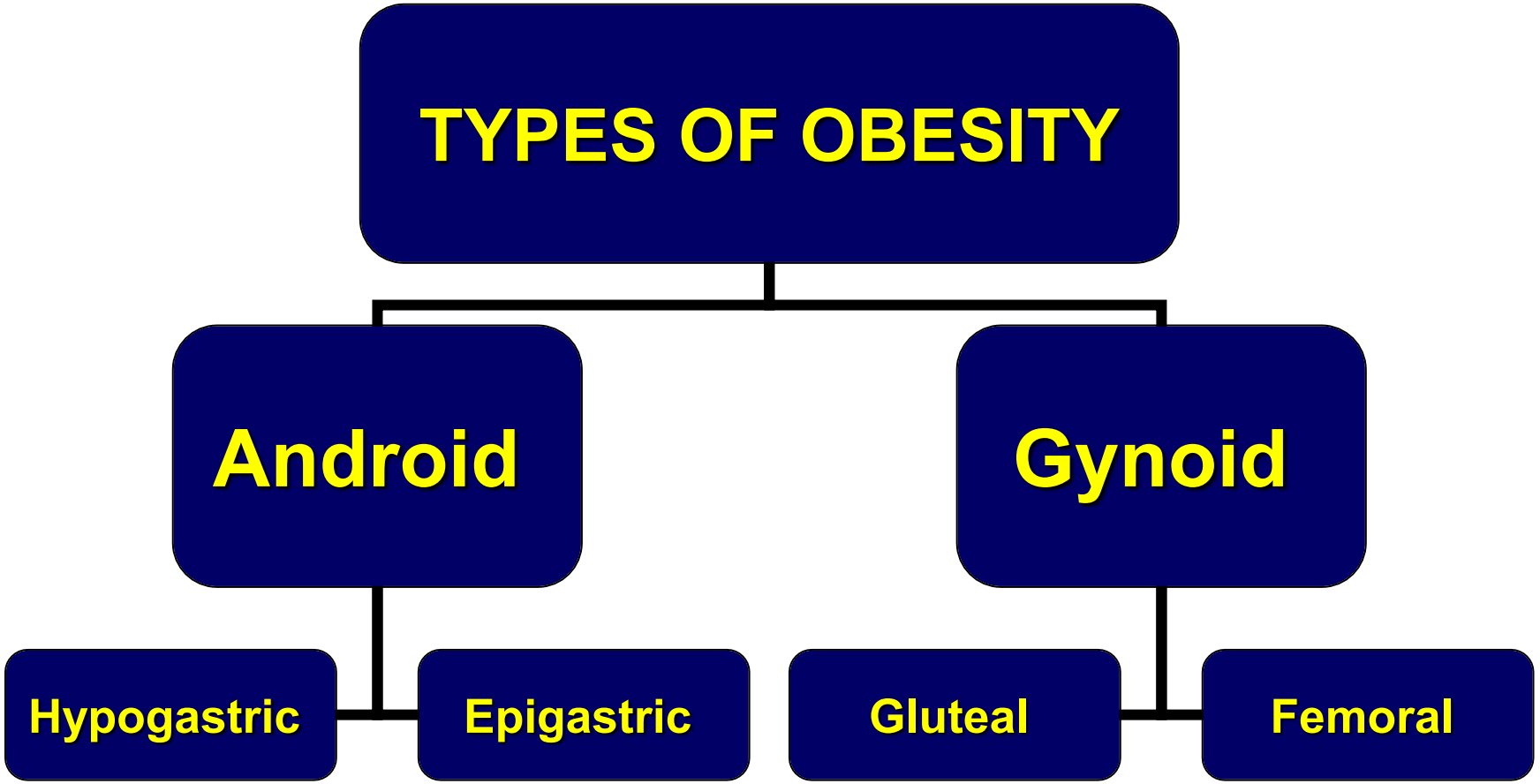
Obesity



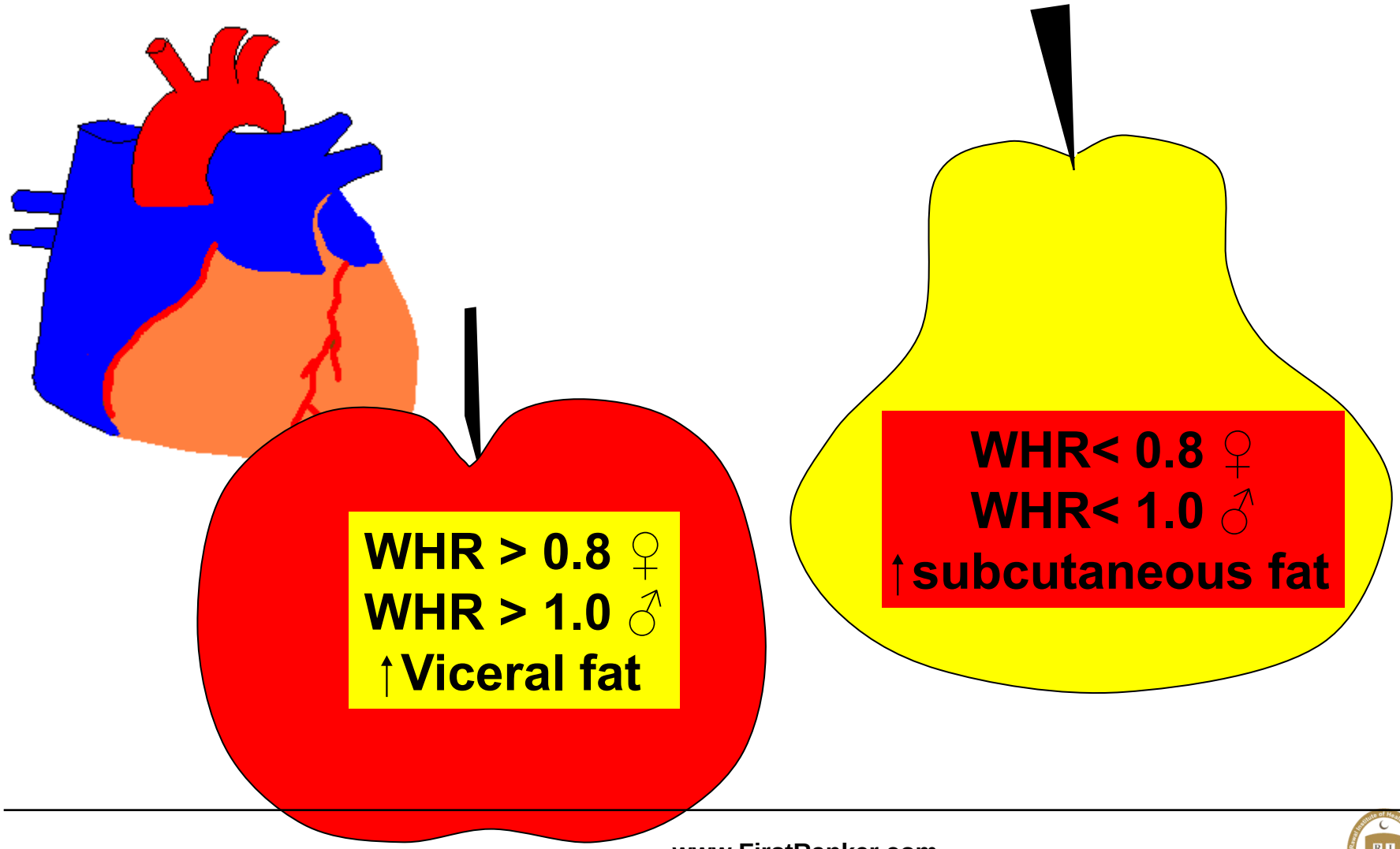
Obesity


TYPES OF FAT
Subcutaneous
Visceral
Thighs
Scapula
Costal
Triceps
Retroperitoneal
Mesenteric
Omental

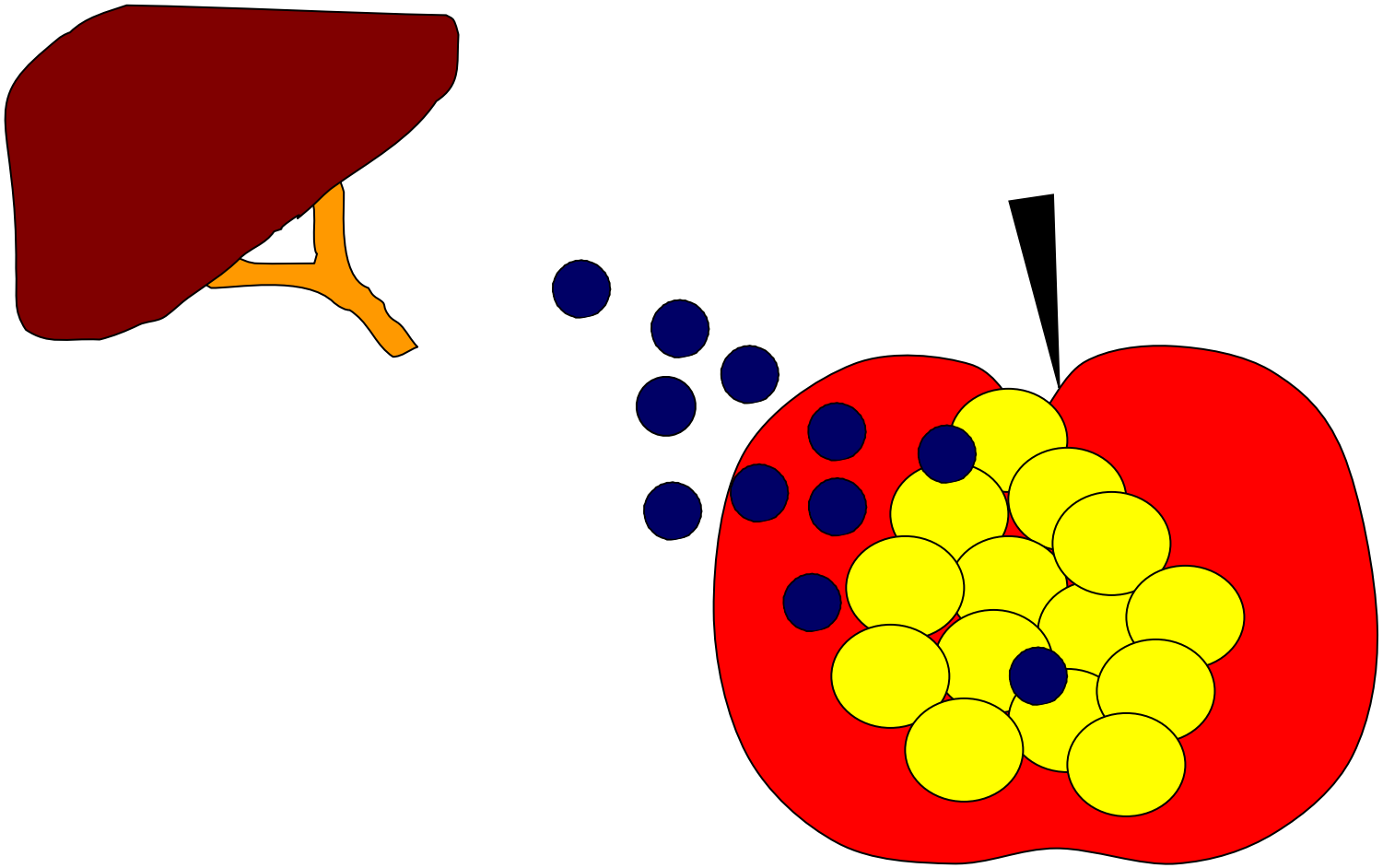
Obesity



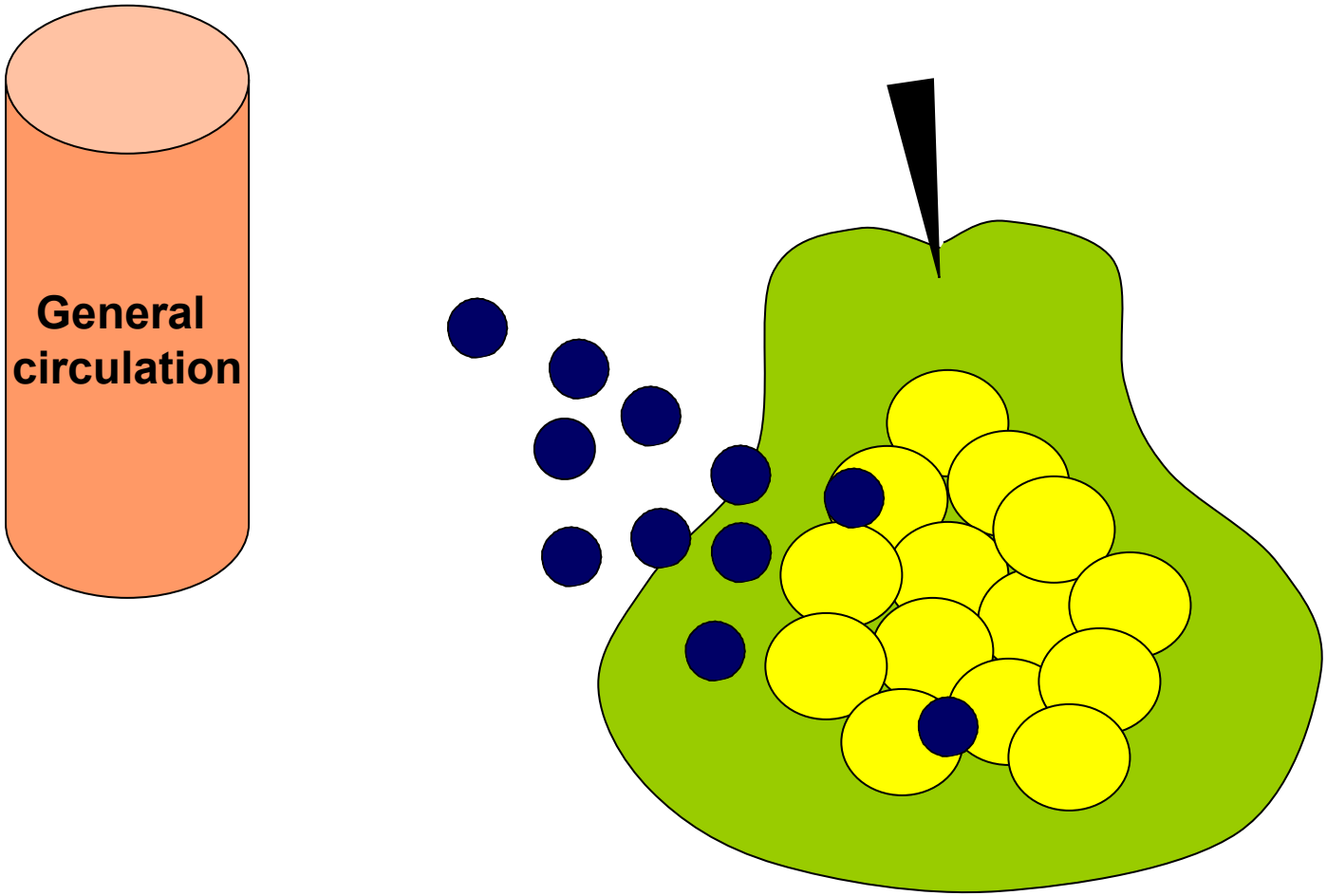
Android and Gynoid obesity



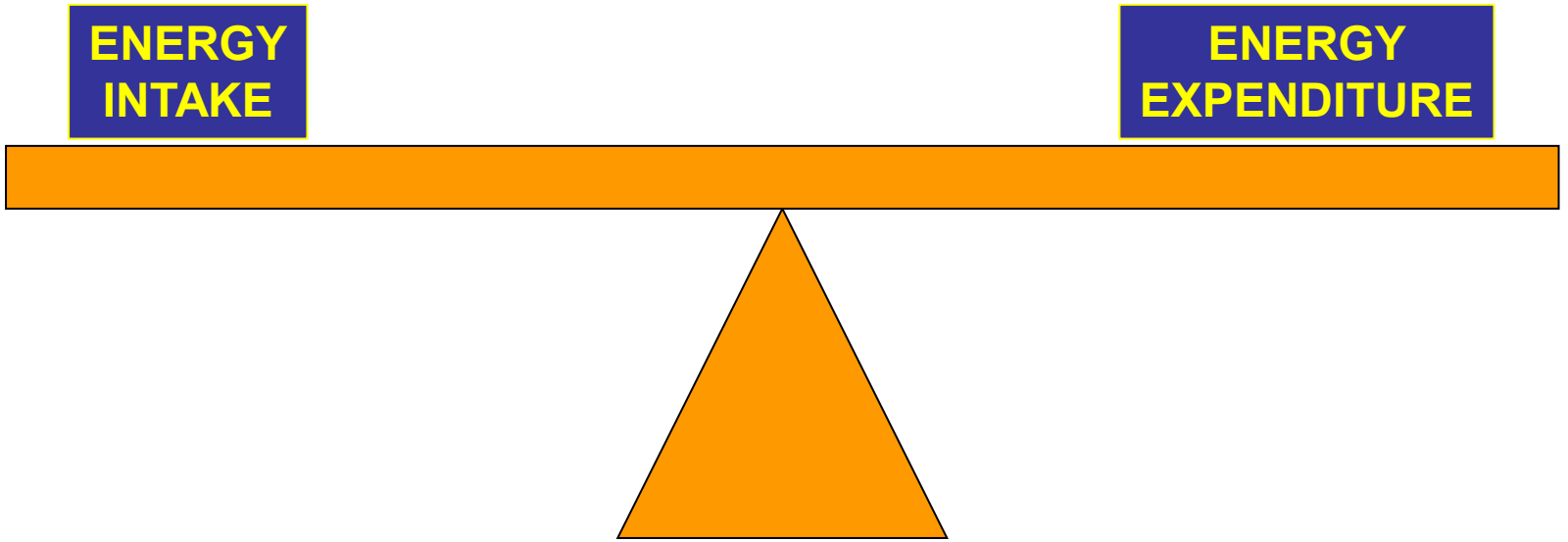
Android and gynoid obesity



Android and gynoid obesity



Body weight regulation



Factors contributing to obesity

- Genetic
  - Both parents obese → 70-80% chance
  - Both parents lean → 9% chance
  - Identical twins → same BMIs
  - Complex polygenic disease
- Environmental
  - Energy rich dense foods
  - Sedentary lifestyle

Metabolic changes in obesity

- Metabolic syndrome
  - Glucose intolerance
  - Insulin resistance
  - Hyperinsulinemia
  - Dyslipidemia (low HDL and elevated VLDL)
- Dyslipidemia

Reducing body weight

- Physical activity
- Caloric restriction
  - One lb of adipose = 3500 kcal
- Pharmacological
  - Sibutramine
  - orlistat
- Surgical treatment

The underprivileged ….

STARVATION

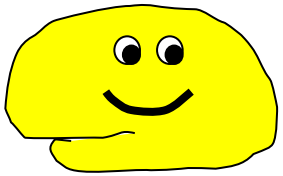
Or who is he that will provide for you, if He should withhold His providence?

None, but they are set in pride and haughtiness.

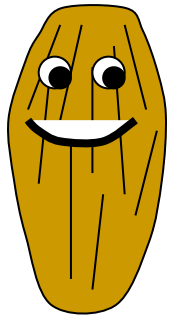
Al-Quran

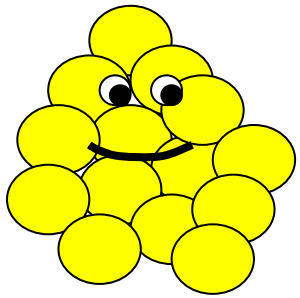
Energy metabolism

- Availabilty of substrates
- Allosteric activation and inhibition of enzymes
- Covalent modification of enzymes
- Induction/ repression of enzyme synthesis



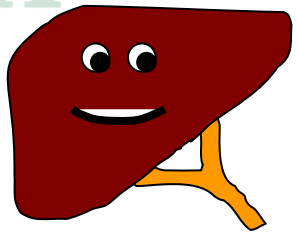
story of sharing and caring!





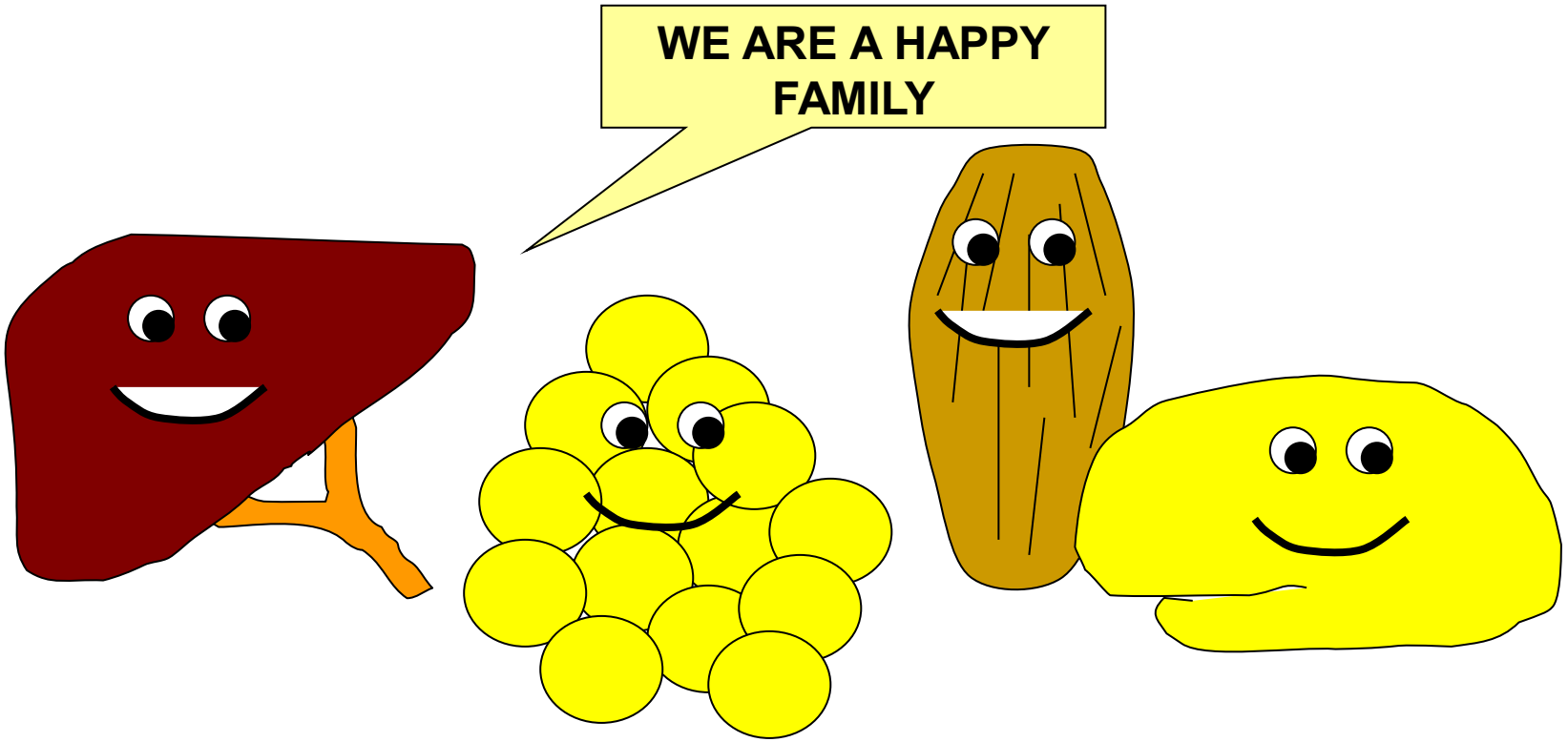
UNITY IS STRENGTH

UNITY IS STRENGTH

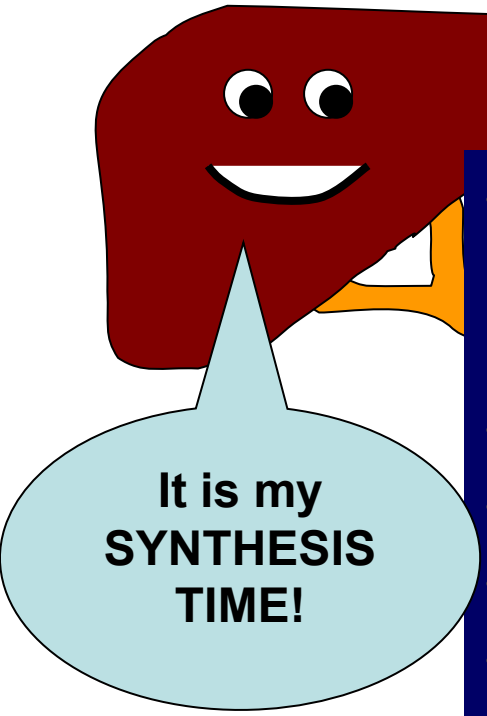


Tale of a family who survived crises!

Well fed state



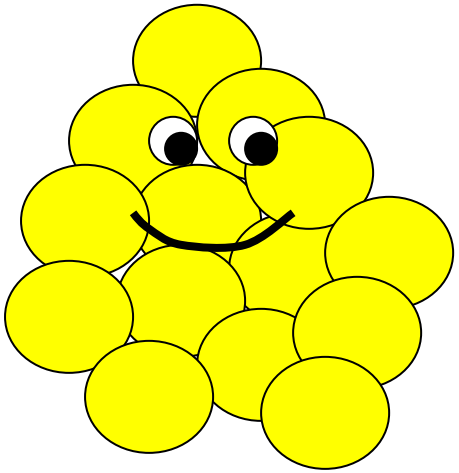
Well fed state



- I'll eat glucose and get acetyl CoA from it
  - FA synthesis
  - CAC cycle
- I'll synthesize and store glycogen for rainy days
- I'll synthesize triglycerides
- I'll synthesize VLDL from TAG
- I'll replenish proteins

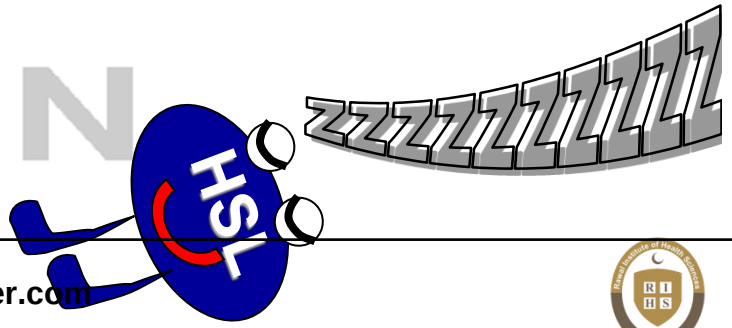
INSULIN

Well fed state

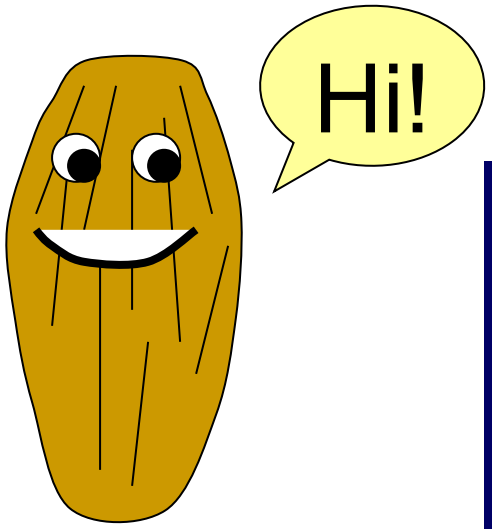


- I'll have glucose and get G3P from it
- I'll synthesize TAG and store it
- I'll send HSL to bed, he needs rest
- I'll put LL to work, it is his turn

INSULIN



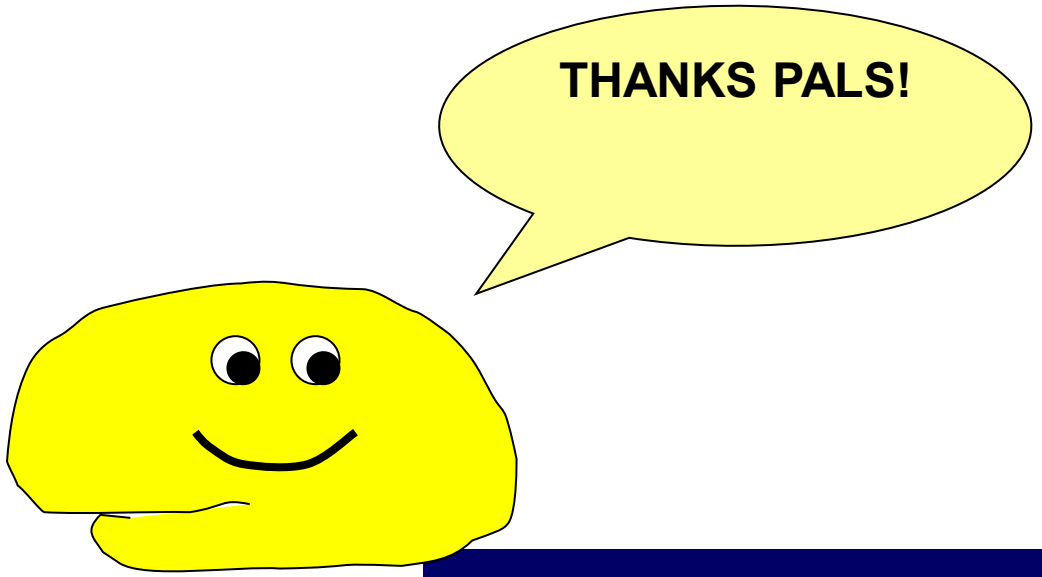
Well fed state



- I'll have glucose to eat
- I'll store glycogen
- I'll synthesize my proteins

INSULIN

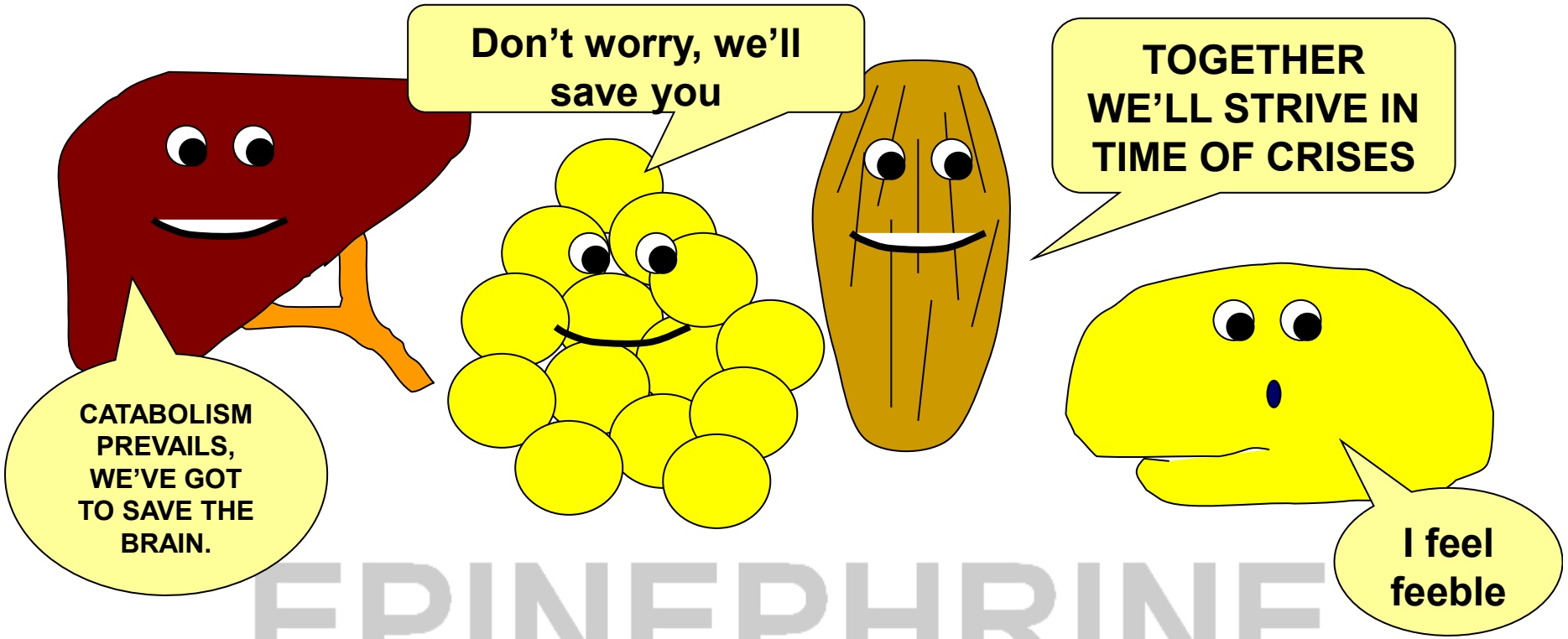
Well fed state



- I can eat as much glucose as I like

INSULIN

Starvation



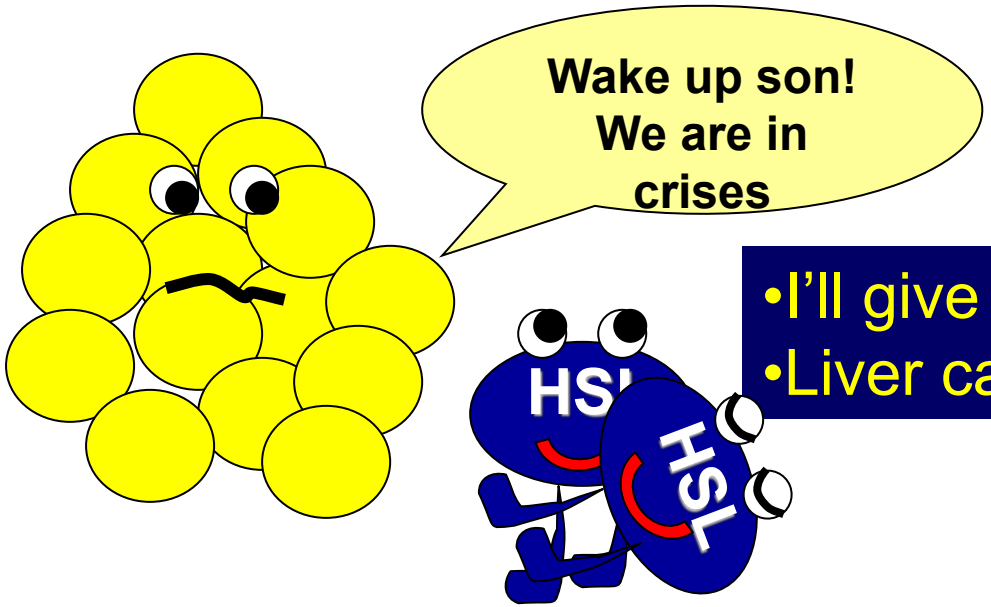
EPINEPHRINE

GLUCAGON

Starvation

- I'll give my glycogen for glucose
- I can make glucose → gluconeogenesis
- I'll eat FA myself
- I'll make ketone bodies from acetyl coA for the others

Starvation



- I'll give my triglyceride stores
- Liver can have FA & glycerol

EPINEPHRINE

GLUCAGON

Starvation

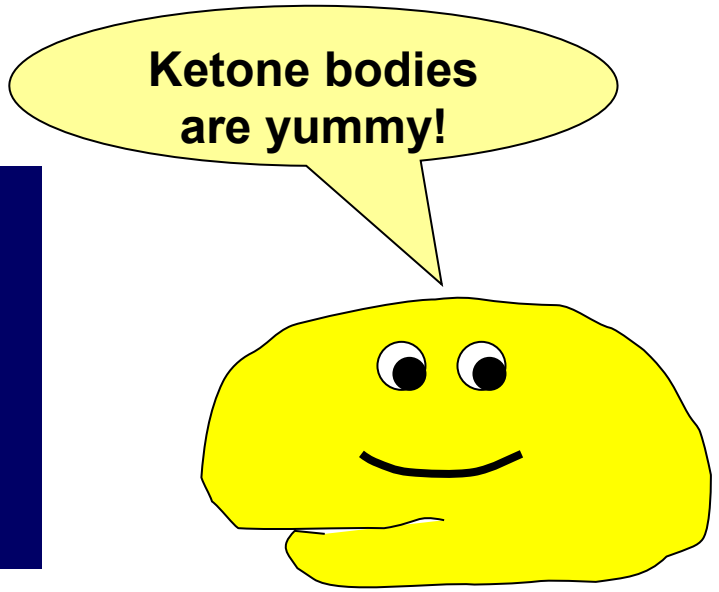
- Liver can use my proteins to make glucose
- I'll also give my glycogen
- I can eat FA and ketone bodies they are yummy!

EPINEPHRINE

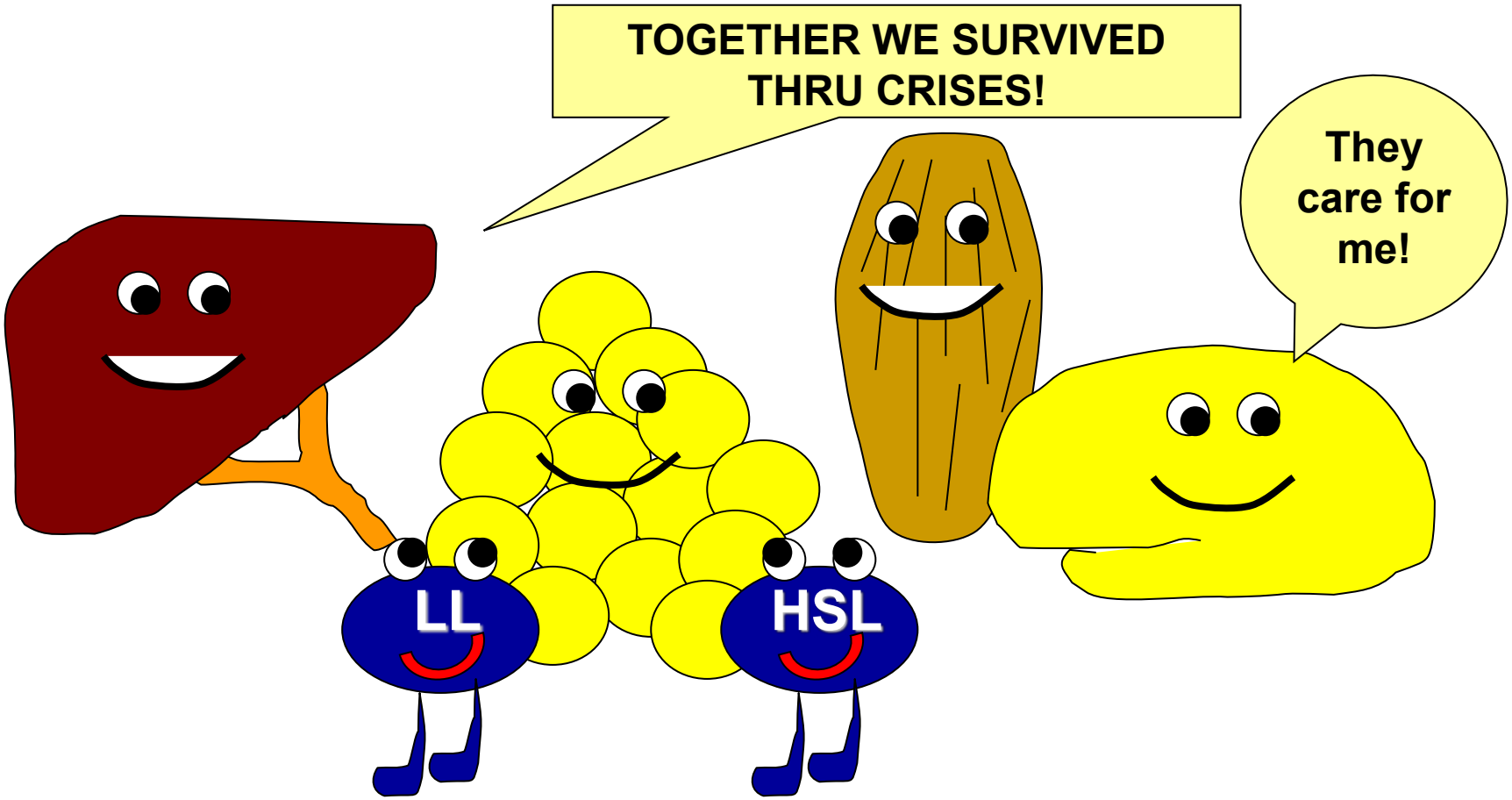
GLUCAGON

Starvation

- Thanks everybody for sacrificing your fuels for providing me glucose
- I can also live on ketone bodies if situation arises



Sharing and caring



Skeletal vs cardiac muscle

- SKELETAL
  - O2 consumption
    - 30% (rest) 90% (exer)
    - Anaerobic as well
  - Activity
    - Intermittent
  - Fuel
    - Rest
      - FFA , ketone bodies
    - Exercise / after meal
      - Glucose, branched chain aa
  - Energy store
    - glycogen
- CARDIAC
  - O2 consumption
    - Only Aerobic metaboilsm
  - Activity
    - Continuous
  - Fuel
    - Glucose
    - FFA
    - Ketone bodies
  - Energy store
    - Negligable amount of glycogen and lipid