

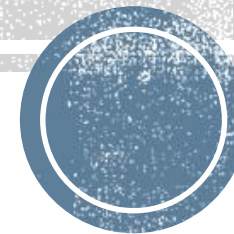
CICLO DE PALESTRAS

Alimentação e saúde

**Universidade Federal do
Estado do Rio de
Janeiro (UNIRIO)**

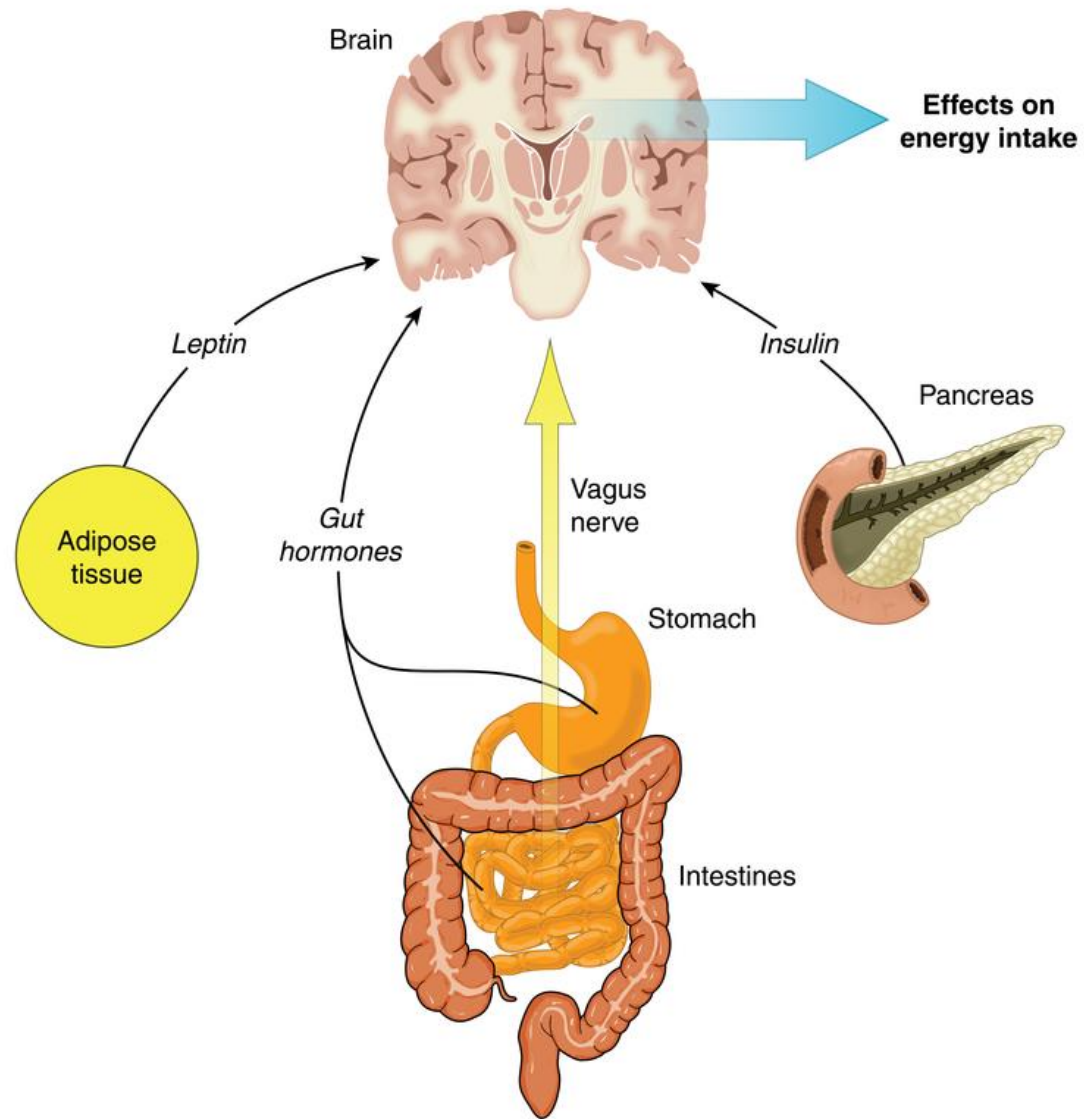


Microbiota: a interação cérebro - intestino



Mestranda: Mônica Cristine

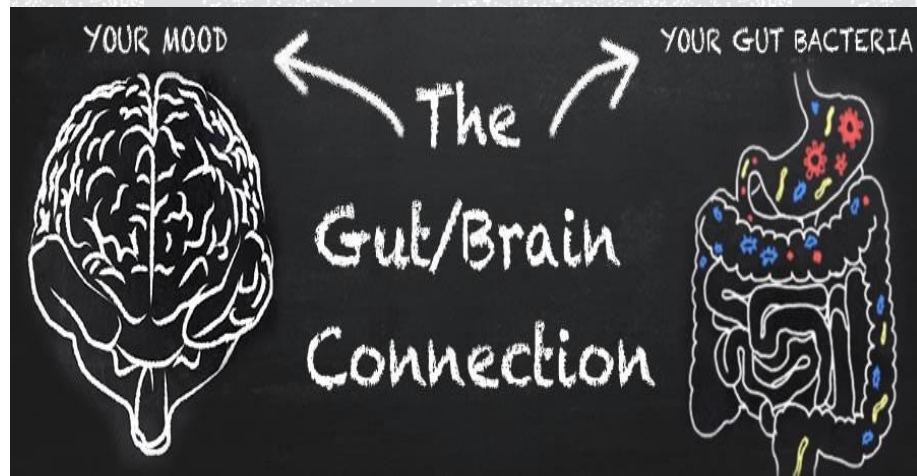
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Introdução

- Pode o intestino influenciar no funcionamento do Sistema nervoso?
- Hormônios
- Mediadores inflamatórios (citocinas)

▪ **INFLAMAÇÃO!!!**



The Brain in Your Gut

The gut's brain, known as the enteric nervous system, is located in sheaths of tissue lining the esophagus, stomach, small intestine and colon.

SMALL INTESTINE CROSS SECTION

Submucosal plexus

Layer contains sensory cells that communicate with the myenteric plexus and motor fibers that stimulate the secretion of fluids into the lumen.

Myenteric plexus

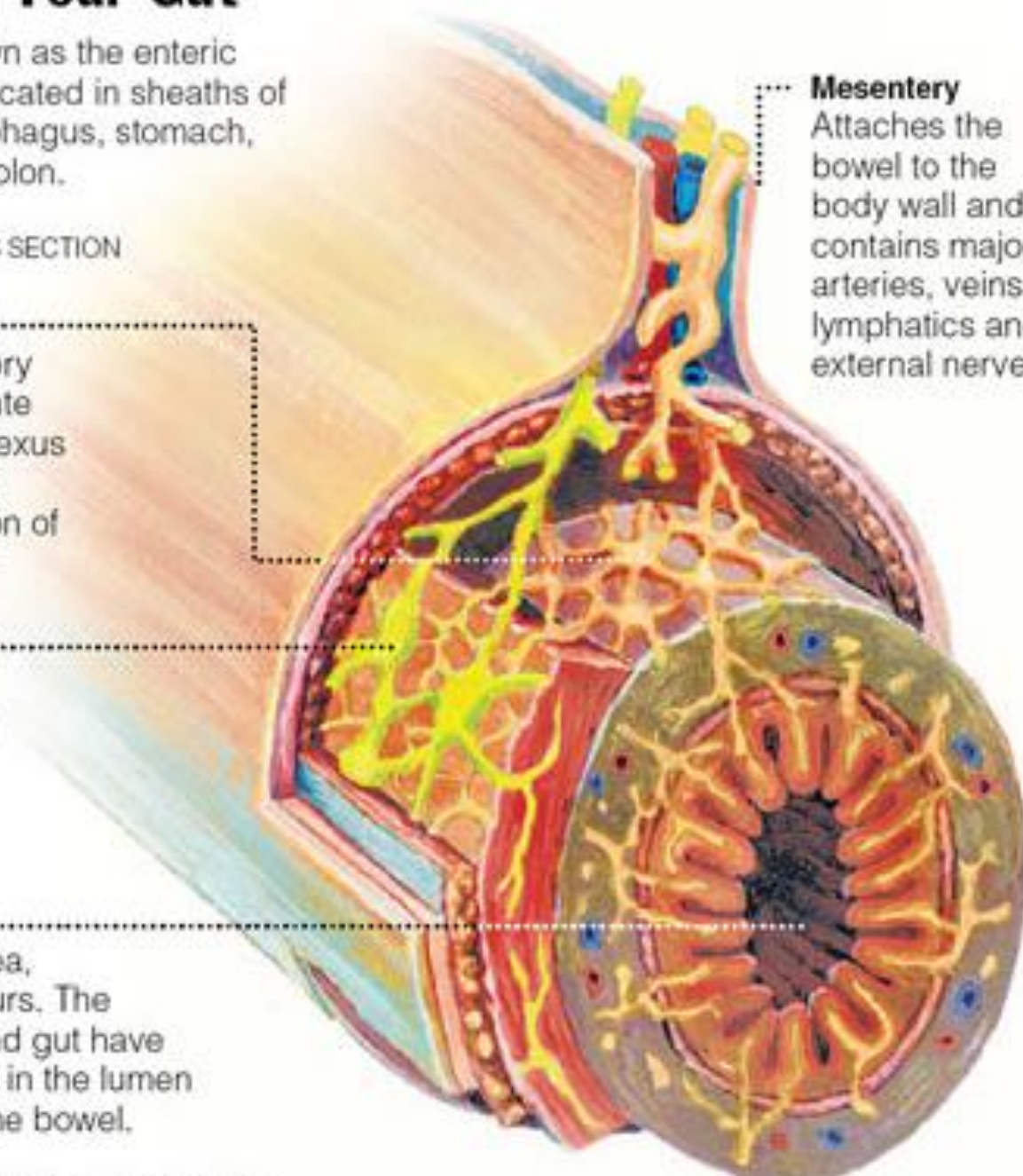
Layer contains the neurons responsible for regulating the enzyme output of adjacent organs.

Lumen

No nerves actually enter this area, where digestion occurs. The brains in the head and gut have to monitor conditions in the lumen across the lining of the bowel.

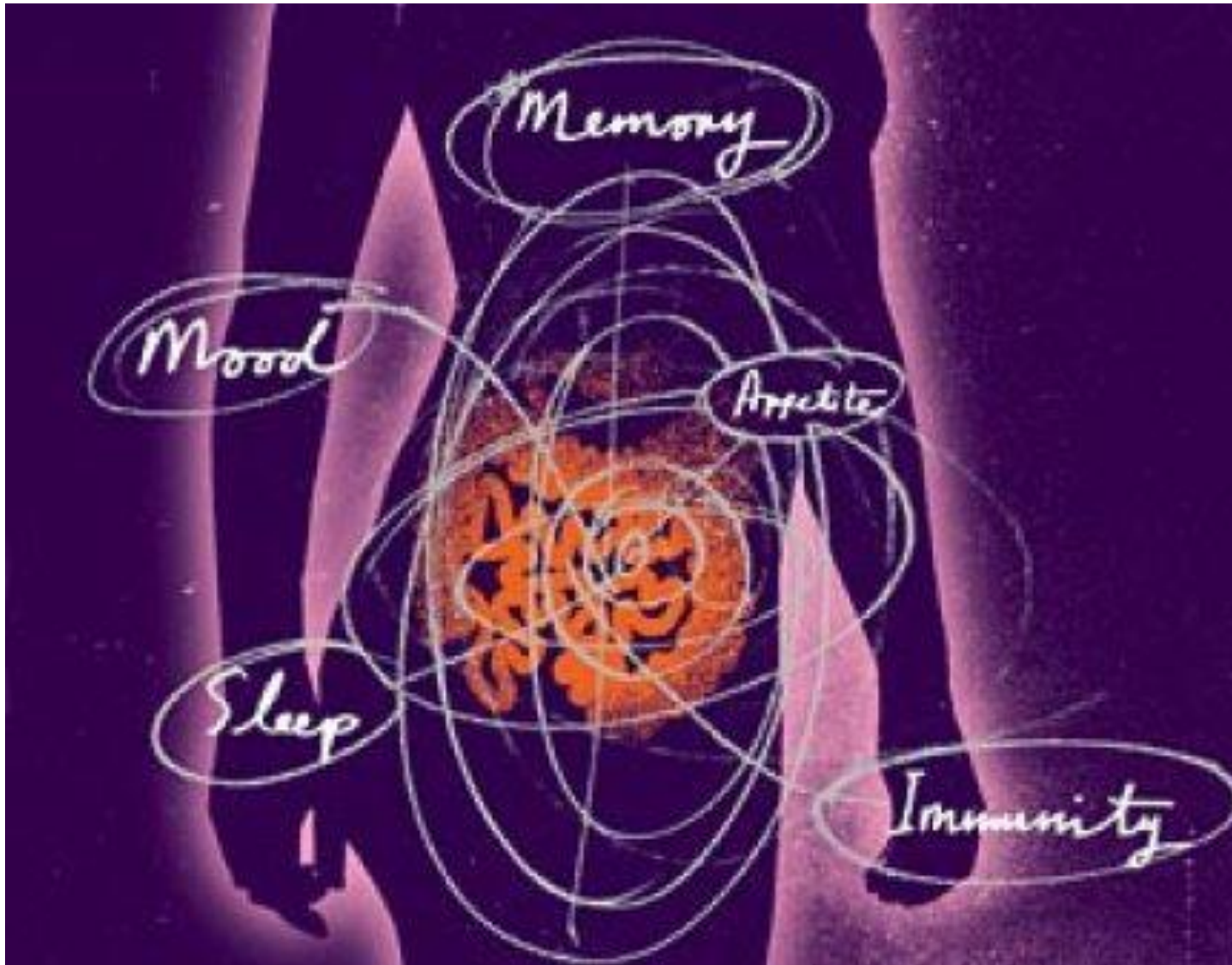
Mesentery

Attaches the bowel to the body wall and contains major arteries, veins, lymphatics and external nerves.



O cérebro no intestino

- Sistema nervoso entérico (SNE)
- Esôfago ao cólon
- Composição x Função
- Emoções e o intestino??
- Stress



Saúde x Stress

- Memória;
- Sono;
- Imunidade
- Estado inflamatório
- Humor
- Aprendizagem
- Resposta a dor

HEALTHY STATUS

STRESS/DISEASE

Healthy CNS
function

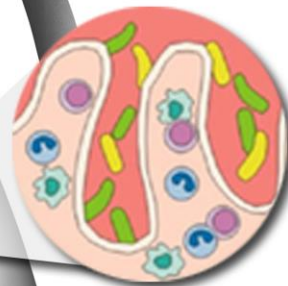
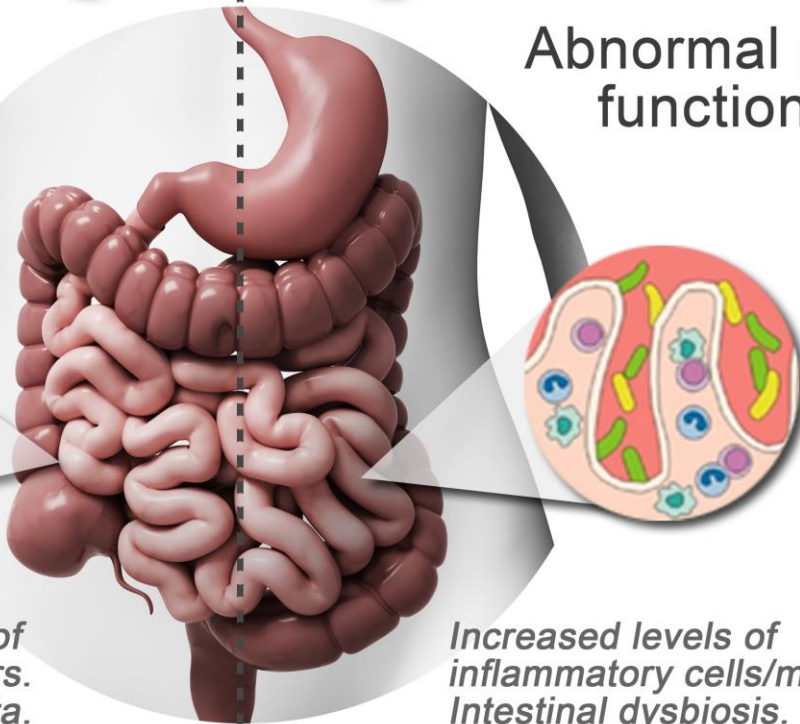
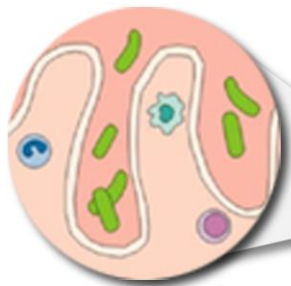


Alterations in
behaviour, cognition,
emotion, nociception



Normal gut
physiology

Abnormal gut
function

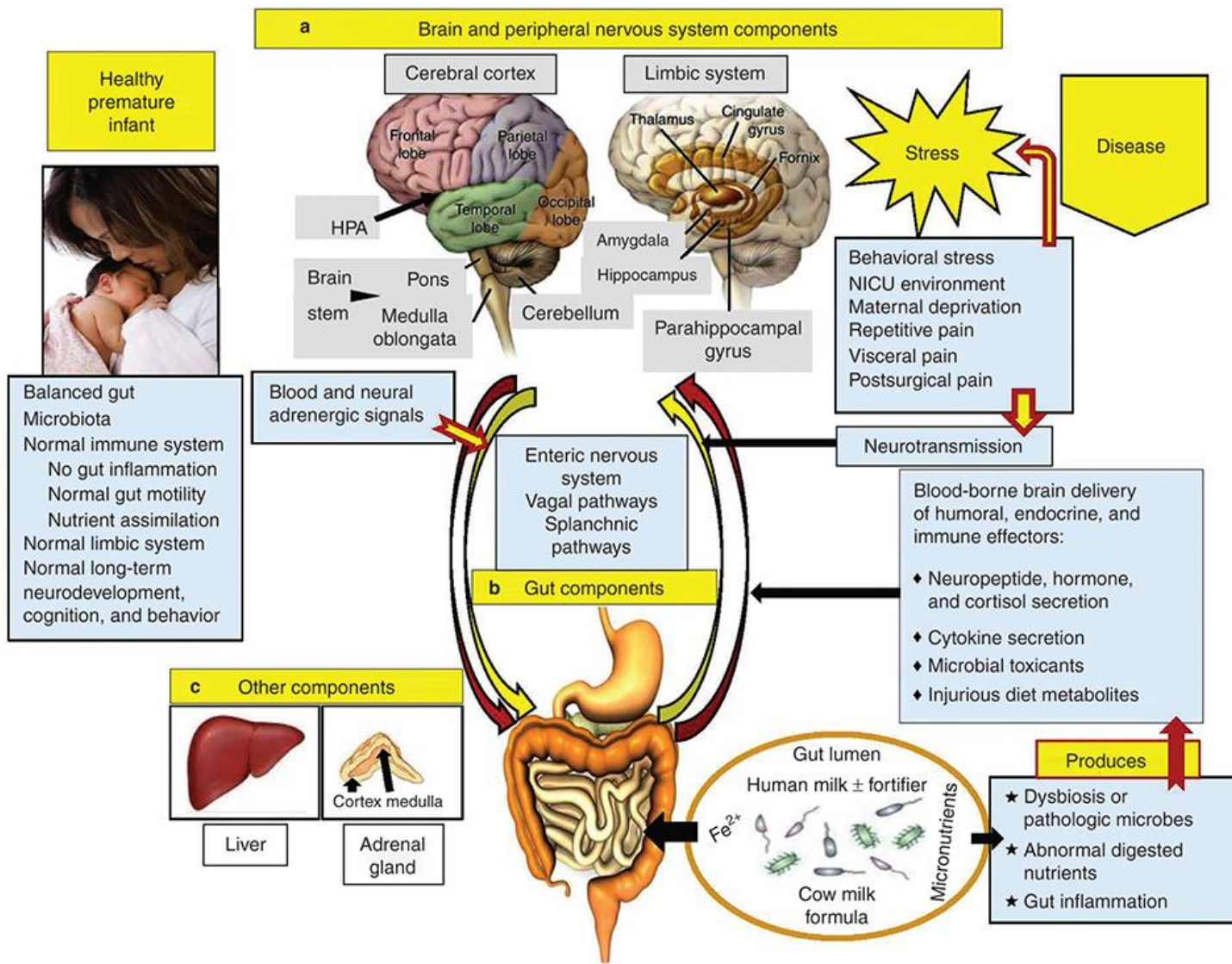


*Physiological levels of
inflammatory cells/mediators.
Normal gut microbiota.*

*Increased levels of
inflammatory cells/mediators.
Intestinal dysbiosis.*

Saúde x Stress

- Alterações cognitivas
- Comportamentais;
- Emocionais;
- Autismo;
- Depressão

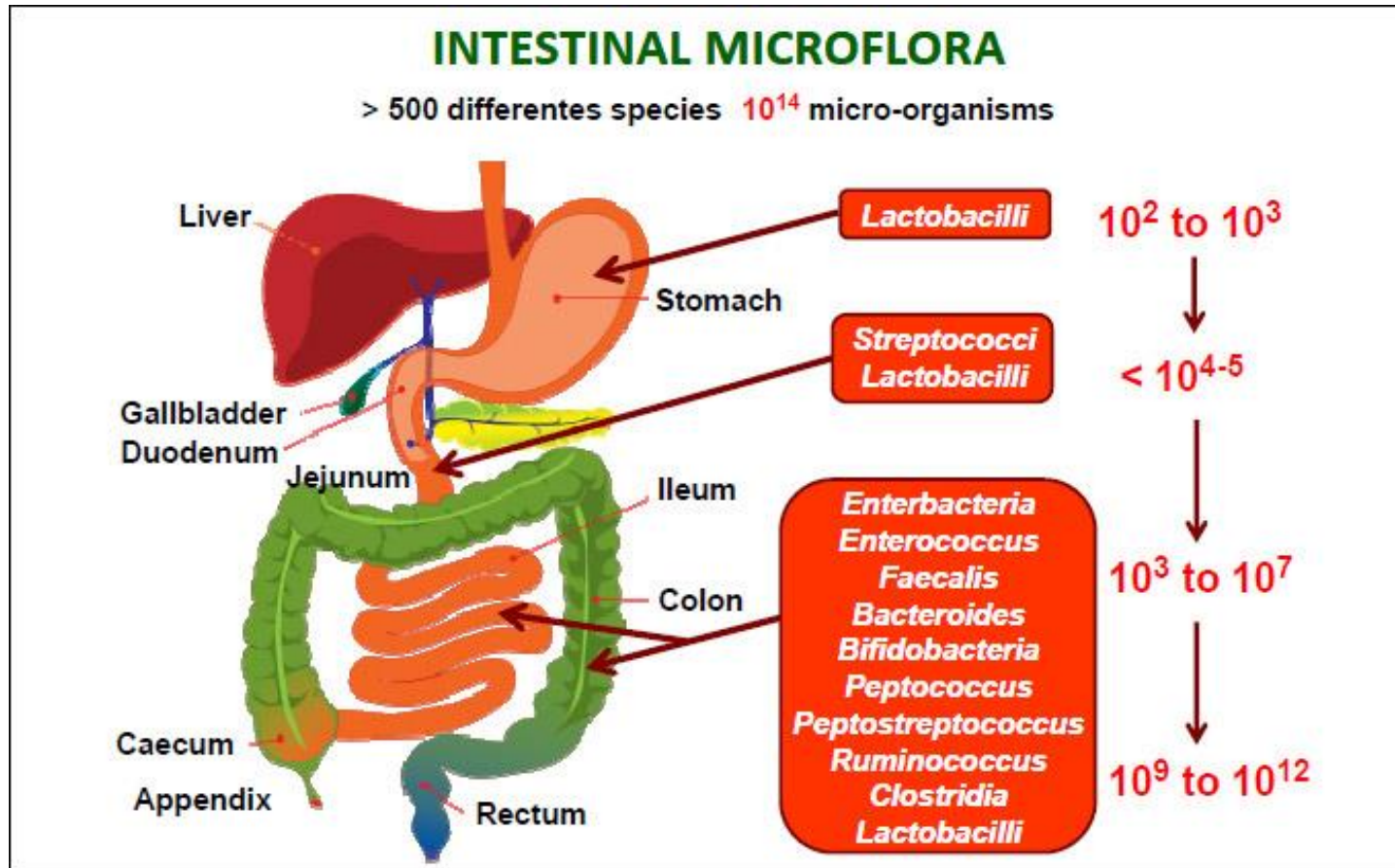


Infância

- Modulação
- Amamentação
- Dietas da moda
- Fígado e rins
- Leite de vaca
- Alergias

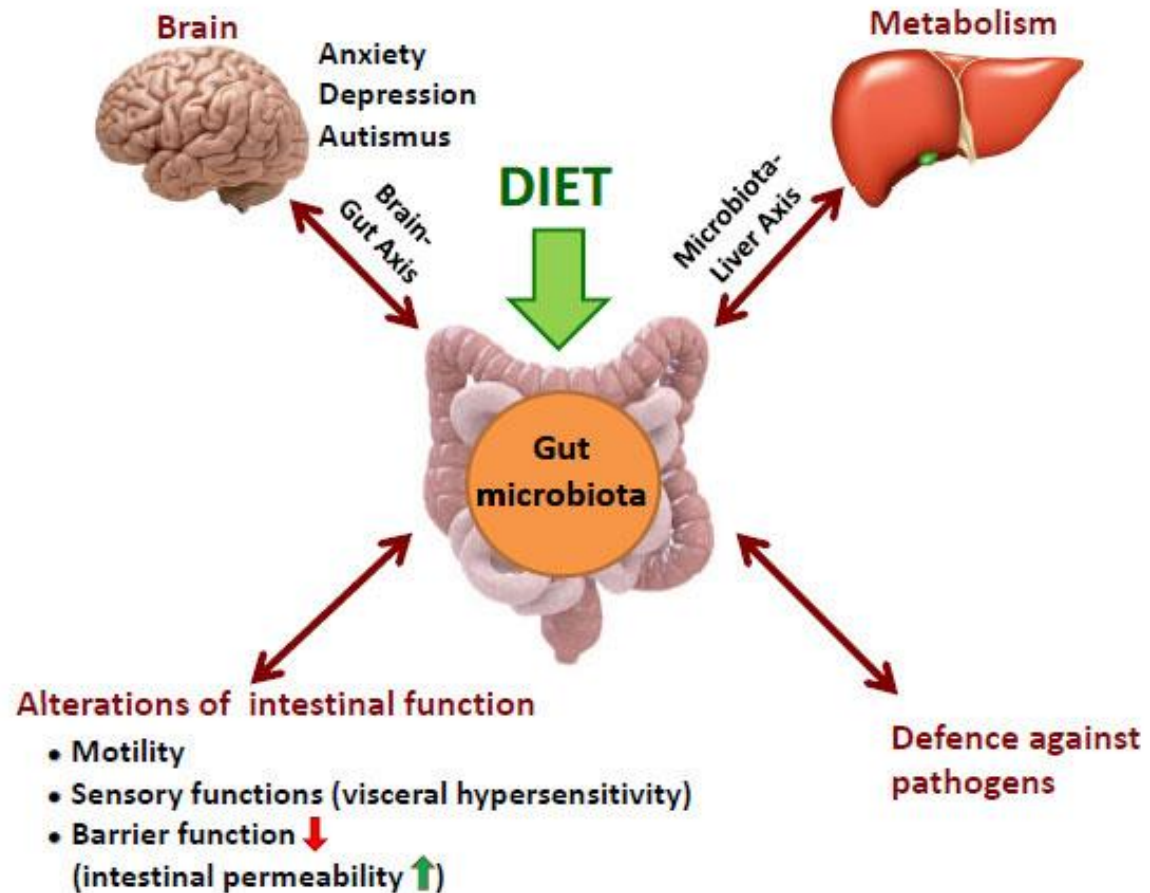
MICROBIOTA

Microbiotas no corpo



- Microorganismos
- 100:1 (células)
- 10% humanos
- *Firmicutes e Bacteroidetes*

Papel da dieta



- Fibras
- Compostos fenólicos
- Gordura
- Disbiose
- Medicamentos ?? (P450)

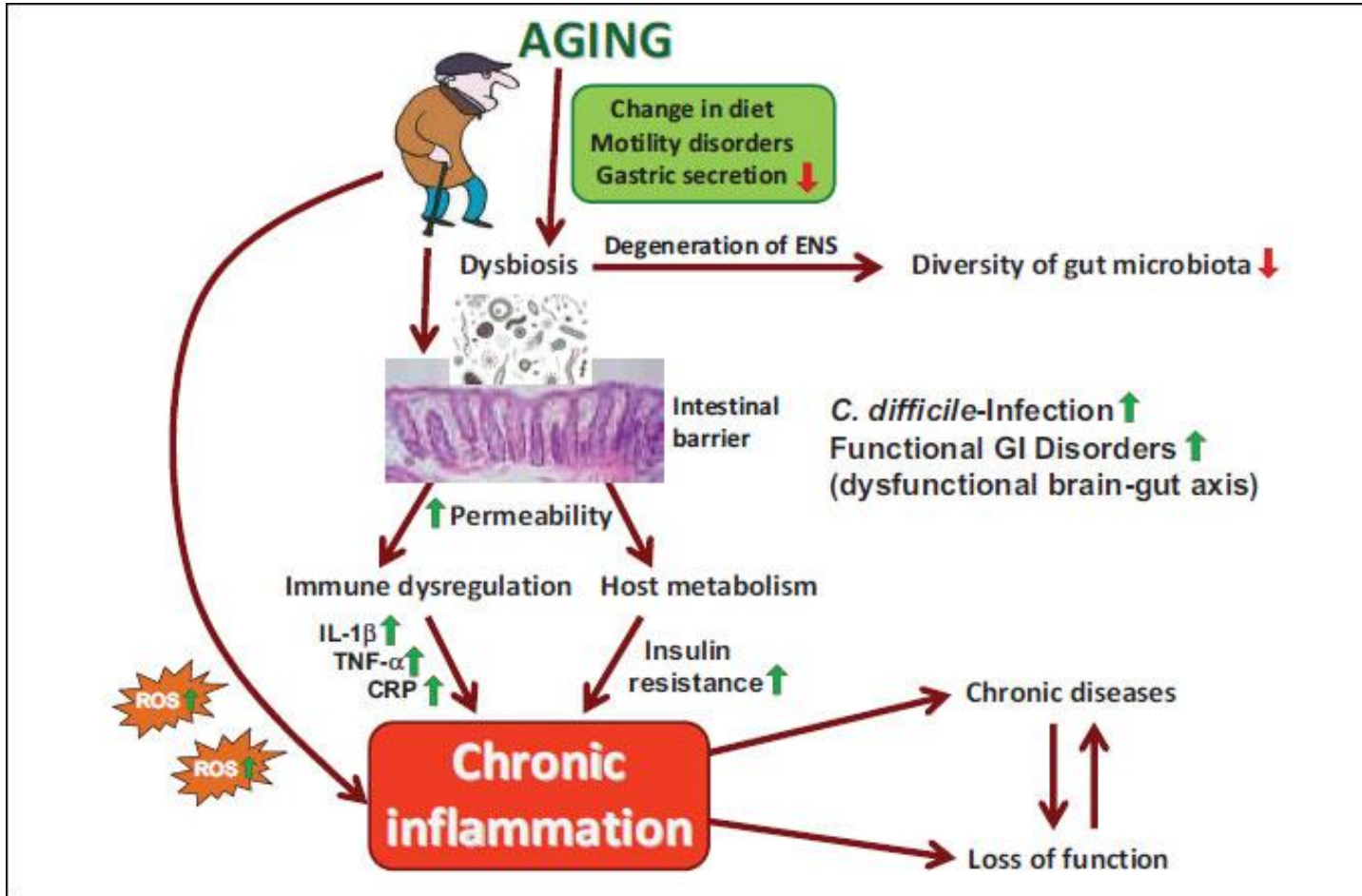
▪ Microbiota -> Appetite!

▪ **INFLAMAÇÃO!!!**

“Aging”

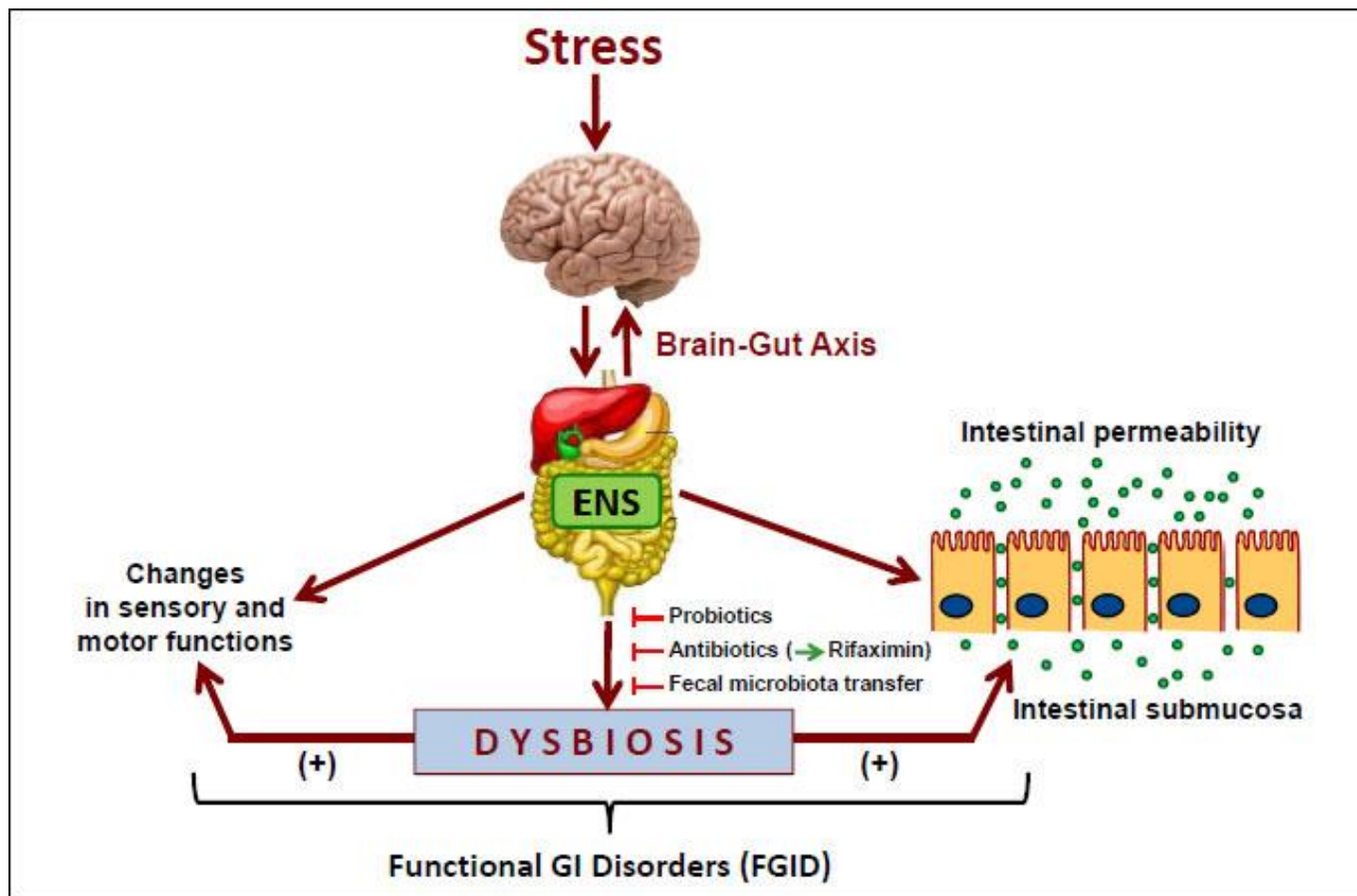
- Dieta
- Motilidade intestinal
- Secreção Gástrica
- Disbiose

▪ INFLAMAÇÃO!!!

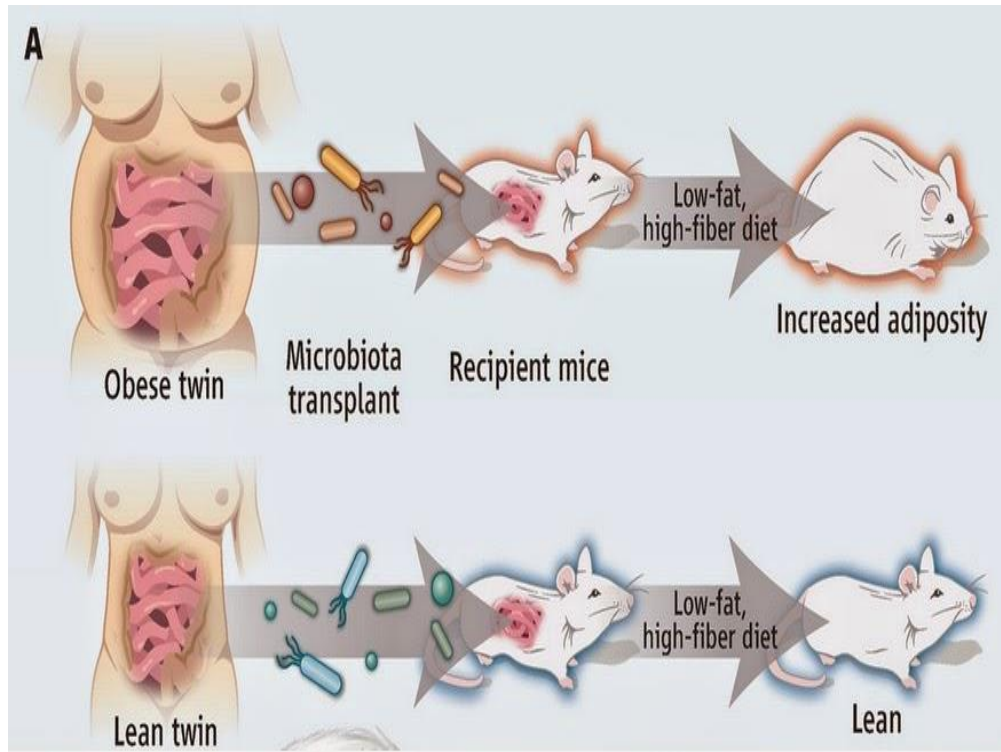


Modulação?

- Permeabilidade Intestinal
- Sistema imunológico
- Probiótico
- Prebiótico
- Simbiótico



An obesity-associated gut microbiome with increased capacity for energy harvest.



- Camundongos ‘germ-free’ colonizados com microbiota de obesos -> maior percentual de gordura;
- Camundongos ‘germ-free’ colonizados com microbiota de magros -> menor percentual de gordura;
- A inoculação com as duas microbiotas também promove o acúmulo de gordura (nível intermediário)

The gut microbiota as an environmental factor that regulates fat storage

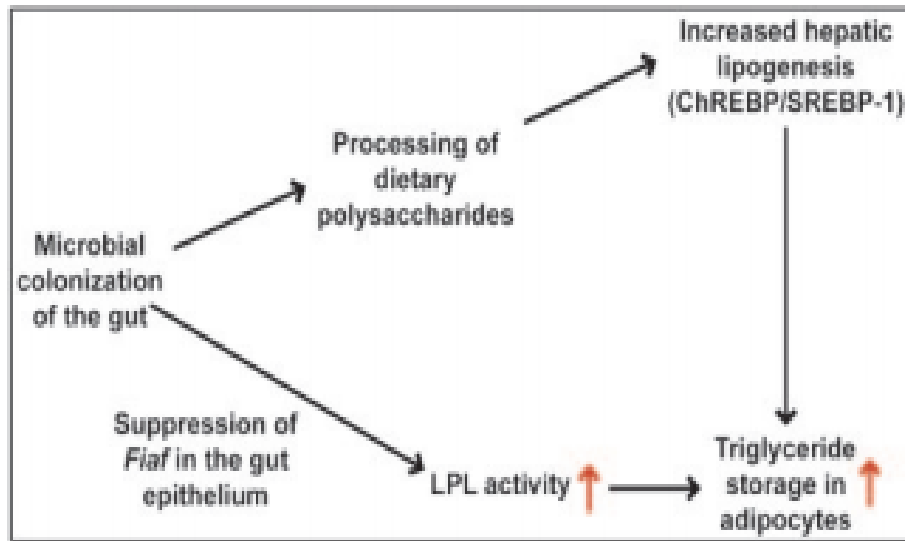
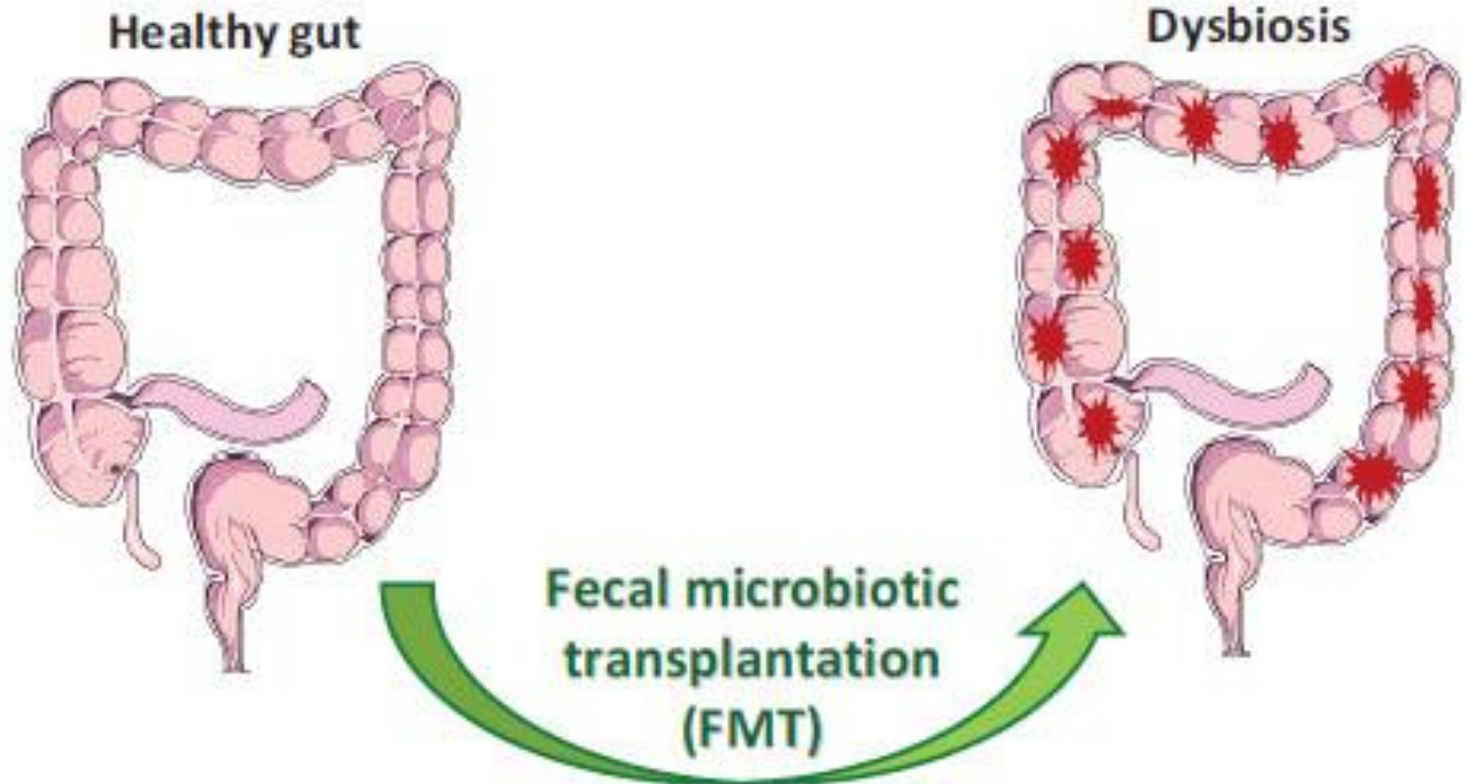


Fig. 5. Schematic view of how the gut microbiota effects host fat storage. The microbiota acts through Fiaf to coordinate increased hepatic lipogenesis with increased LPL activity in adipocytes, thereby promoting storage of calories harvested from the diet into fat. See text for further details.

- Camundongos ‘**germ free**’ têm menor percentual de gordura, mesmo comendo mais ração;
- Ao serem inoculados tem aumento no percentual de gordura e perdem massa magra (mesmo comendo 27% menos)
- Aumento do metabolismo basal, glicemia e indução de resistência à insulina;
- A presença de bactérias dobra a capacidade intestinal de absorver glicose;
- A enzima (LPL) responsável por trazer gorduras da circulação para o tecido adiposo teve sua atividade aumentada em mais de 100%.
- FIAF (fasting-induced adipose factor)

Bäckhed et al.



Feces from healthy donor

Intestinal tube

Coloscopy

Gastroscopy/
Enteroscopy

Transplante fecal

- Fezes de recém nascidos;
- Amamentados x Fórmula
- Microbiota
- Obesidade

- MODULAÇÃO!!!

Obrigada!

The axis of love:

Gut, you
boost my serotonin
baby!



Oh Brain!
You give me
butterflies!

