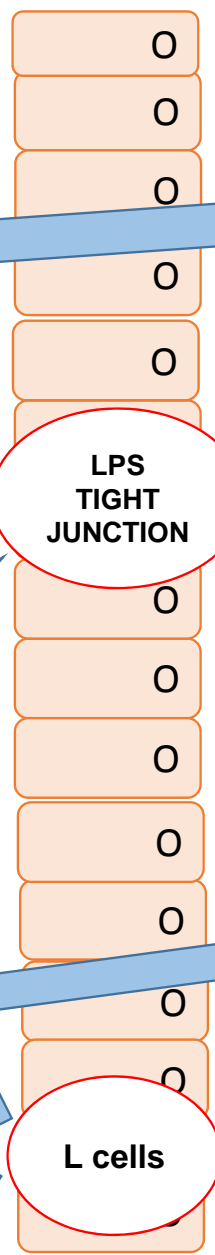


**IMBALANCE OF GUT  
MICROBIOTA = DYSBIOSIS**

Secondary bile acids  
TMA metabolism &  
SCFAs

Toxic effect of  
dysbiosis to  
increase  
intestinal  
permeability

Gram -ve  
bacteria



FXR activity  
Cholesterol metabolism  
Lipogenesis &  
Gluconeogenesis

**NAFLD**

TMAO

Inflammatory cytokines

- *Tissue inflammation*
- *Liver fat accumulation*
- *Cholestasis*
- *Carcinogenesis*
- *Atherosclerosis*
- *Type 2 diabetes*
- *CKD*

LPS

LPS  
TIGHT  
JUNCTION

LPS  
Uraemic toxins

**CKD**

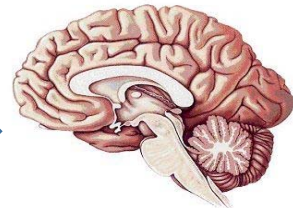
Gluconeogenesis

SCFAs

Satiety

L cells

PYY  
GLP-1



- *Satiety*
- *Obesity*
- *Glucose control*

Figure 4