GUTS!

The amazing trip of our food

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The gastrointestinal tract

- Mouth
- Salivary glands
- Pharynx
- Esophagus
- Liver
- Stomach
- Pancreas
- Small intestine
- Large intestine
- Appendix
- Rectum
- Anus

- Food
- Cud
- Chyme
- Chyle
- Feces

Microbiota
The stomach

1822 – 1833

Alexis St. Martin

William Beaumont

Dark Matters. Twisted but true series 2x01
Nutrient absorption

Organoids or “mini guts”

The immune system: tolerate the nutrients!

Innate immune cells
- Mast Cell
- Eosinophil
- Basophil
- Neutrophil
- Monocyte

Adaptive immune cells
- B Cell
- T Cell
- Macrophage
- Dendritic Cell

Tolerate!!!
The immune system: tolerate the nutrients!

**Innate immune cells**
- Mast Cell
- Eosinophil
- Basophil
- Neutrophil
- Monocyte

**Adaptive immune cells**

**Food intolerance**

Wheat, Barley, Rye, Oat

Celiac disease
The immune system: tolerate the nutrients!

... and the microbiota!

No? Inflammatory bowel disease (IBD)

Wheat Barley Rye Oat Celiac disease

Adaptive immune cells

Macrophage Dendritic Cell
The organizers of the tissue: fibroblasts


The organizers of the tissue: fibroblasts

- Collagen and other fibers
- Wound healing

The organizers of the tissue: fibroblasts

Too much collagen!!!  ➔  Collagenous colitis (IBD, diarrhoea)

The organizers of the tissue: fibroblasts

Northshoregastro.org / rameswaranursinghome.com
The brain in the gut: neurons

The brain in the gut: neurons
The brain in the gut: neurons

- Gut dismotility
- Chronic pain
The brain in the gut: neurons

Tunica muscularis (TM) dissection: Myenteric plexus

Enteric nervous cells (ENC)

Enteric nervous stem/proliferative cells (ENSP)

Neurospheres

What is at the end of the tunnel? Feces!

Intestinal epithelial cells

Diarrhoea

Water reabsorption (Aquaporins & ion channels)

Check your poo to see how healthy you are!!!

Bristol stool chart

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Separate hard lumps, like nuts (hard to pass)</td>
</tr>
<tr>
<td>Type 2</td>
<td>Sausage-shaped but lumpy</td>
</tr>
<tr>
<td>Type 3</td>
<td>Like a sausage but with cracks on its surface</td>
</tr>
<tr>
<td>Type 4</td>
<td>Like a sausage or snake, smooth and soft</td>
</tr>
<tr>
<td>Type 5</td>
<td>Soft blobs with clear-cut edges (passed easily)</td>
</tr>
<tr>
<td>Type 6</td>
<td>Fluffy pieces with ragged edges, a mushy stool</td>
</tr>
<tr>
<td>Type 7</td>
<td>Watery, no solid pieces, Entirely liquid</td>
</tr>
</tbody>
</table>

THE COLORS OF POOP

- **Green**
  - green dye, green vegetables, antibiotics, or bacterial infection
  - pale
  - antidiarrheal medication or lack of bile

- **Yellow**
  - excess fat or small intestine infection
  - bright red
  - red foods, drinks or dyes, hemorrhoids, or bleeding in lower digestive tract

- **Brown**
  - healthy
  - dark red
  - iron supplements, bismuth subsalicylate, or bleeding in lower gut or rectum

- **Black-red**
  - bloody
  - black-red
  - iron supplements, bismuth subsalicylate, or bleeding in upper digestive tract

Abc.net.au / medicalnewstoday.com

Celia Escudero-Hernández 16
Let's put all them all together!

Intestinal epithelial cells (IEC)

Fibroblasts

Neurons

Organ-on-a-chip

IEC tube + in-gel cells

Fluigent / BeOnChip
Want to know more about our bodies?

Watch it at crunchyroll.com
Thank you for your attention!!!