- ***Recent research shows that some parasites present in the environment are good for the gut which is what Crohn's patients lack and why they have their disease -> can't break things down properly***

- **Old Friends Hypothesis** proposes that infections from pathogens we have coevolved with early in our evolutionary history are important in our immune system development.
    - Immune system may not develop properly without exposure to these pathogens.
    - Not the flu, or colds, as those are relatively recent.
    - Recent innovations such as sanitation departments, and clean running water has reduced exposure to deadly pathogens such as cholera, but has also reduced our exposure to old friends.
- ***"old friends" are the old bacteria that we humans have lived with and grown immune to -> helps the immune system grow and learn -> since the early times there have always been germs all around us and w/ our immune system that learns we do not die from these germs simply we learn to kill off bigger things thanks to them***
    - ***Not the flu or cold b/c these are fairy new***
- ***With the increase of sanitation today we have fought off deadly diseases like with cleaner water we have fought off cholera but we have also lost some of our "old friends" where we have less and less minor germs for our immune to learn from making us more prone to become ill esp. w/ allergies***
    - ***The more gut microbial diversity you have the less likely you will suffer from an allergic disease***
- ***Tests have shown that parents that stick the pacifier in their mouths after it falls on the floor before giving it back to their baby have less allergic disease than the parents that sanitize the pacifier and then give it back clean***
    - ***The babies w/ the parents that suck the pacifier before giving it back to them are acquiring the germs that their parents have which aren't harmful but help the immune system grow from what the parents pass on***

- **Allergies**
    - In urban centers, 9.8 percent of children have food allergies, compared to 6.2 percent in rural communities

- **Crohn's Disease**
    - Characterized by various genetic abnormalities that lead to overly aggressive T-cell responses to a subset of commensal enteric bacteria.

Cancer

- Selection favors traits that confer and advantage over competitors
- Makes sense when observing competing organisms
- What about the cells **within** a single body?
- Cancer is when somatic cells start reproducing when not supposed to.
    - Win within the body (group) but the group loses as a result.

Drug Resistance

- ***Bacteria not just w/ medications but with everything in the environment develop and adapt resistance***