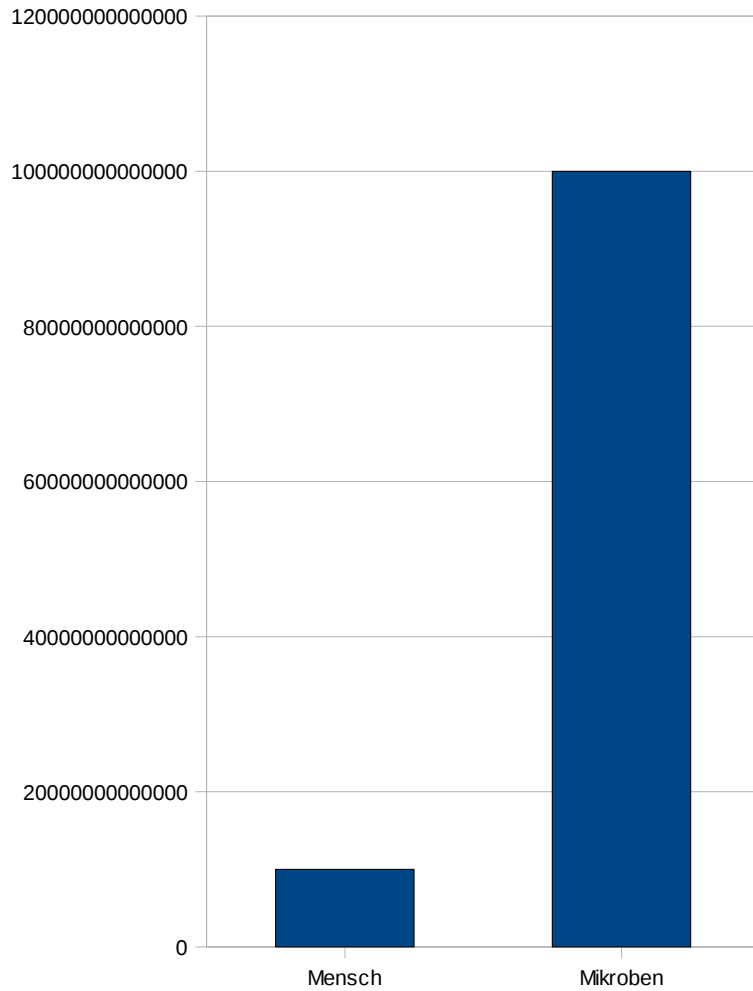


**Mothers and microbes.**



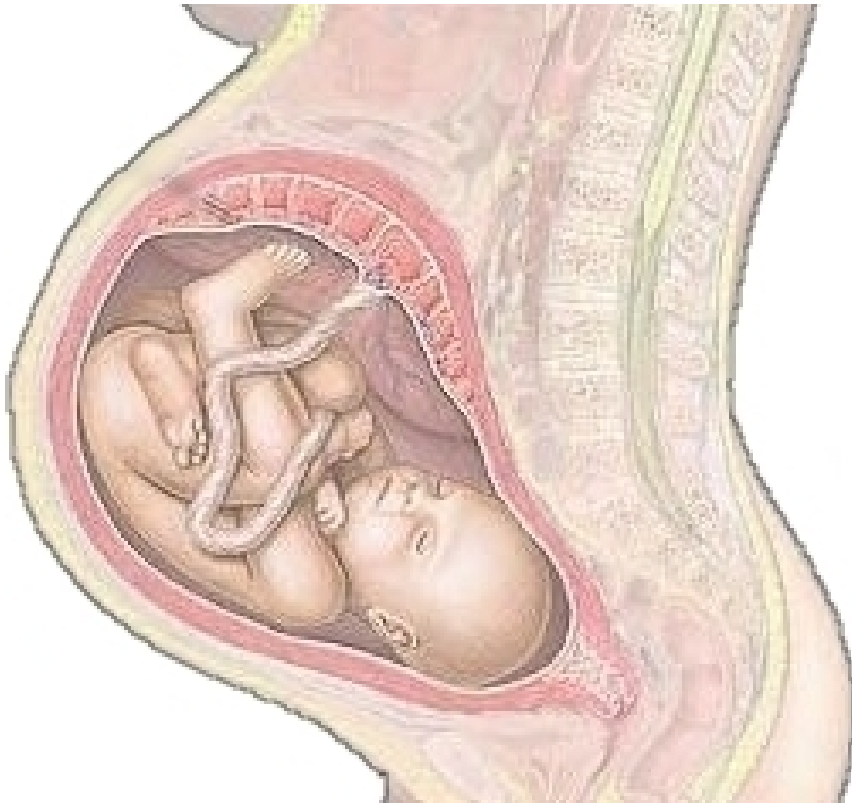
## Humans and microbes.



- One human being contains about 10 trillion human cells.
- One human being contains 100 trillion microbial cells.
  - Bacteria
  - Viruses
  - Fungi, yeasts
  - And many more.
- Ten times more a microbial superorganism, than human.

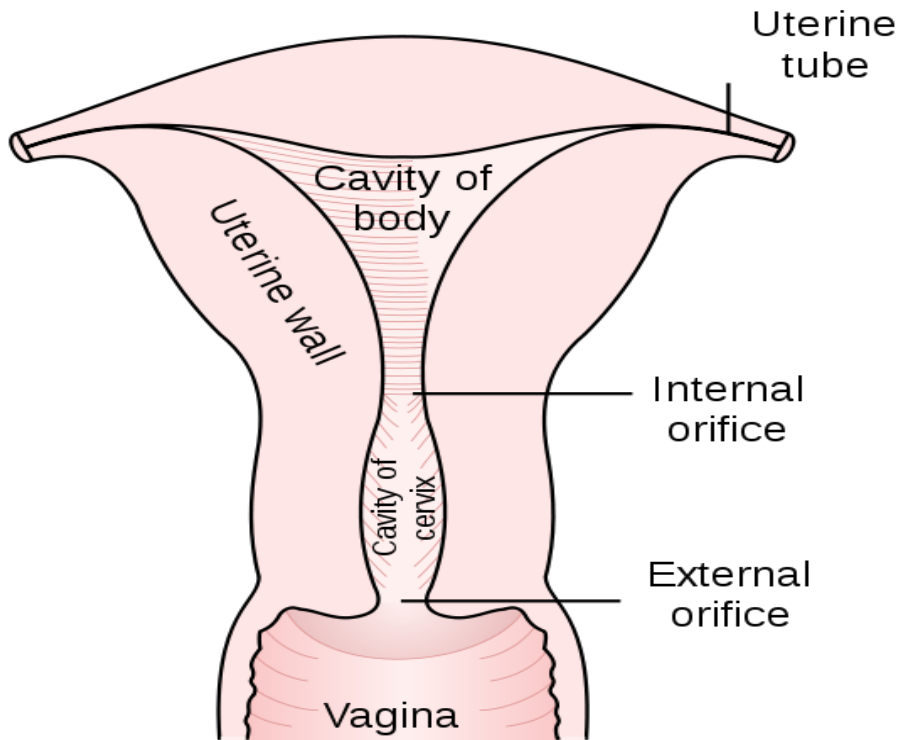
**But how do those microbes get into and onto us?**

## Before birth.



- Before birth the child is protected by the amniotic sac.
- The child is virtually germ-free.
- When does the child come into contact with microbes the very first time?

## birth canal.



Mysid, public domain

- The body prefers to store glycogen in the tissue of the uterus and throughout the birth canal.
- Glycogen is a polymer sugar and a storage form of carbohydrate.
- Lactic acid bacteria live from this glycogen.
- Lactic acid bacteria produce lactic acid which protects the birth canal from infections and is essential for the microbial balance inside the uterus.
- During birth the child swallows lots of those lactic acid bacteria and the body gets smeared up, covered by a protective layer.
- Lactic acid bacteria are the very first microbes populating the young human being.
- Those bacteria protect the child from microbial infections by their work.

## breast-feeding.



- Before the birth Bifidobacteria troop up around the nipples of the mother.
- Bifidobacteria are very beneficial and symbiotic microbes living with you.
- Especially important for you immune system!
- Through breast feeding at the nipples of the mother, the bacteria are transmitted from the mother to her child.
- They protect the germ-free child from mishap population of the non-symbiotic microbes.

## Kissing.



- Kissing stems from an archaic form of child feeding.
- The mother chewed the food in her mouth until it was a pulp.
- This pulp was feeded to the child mouth to mouth.
- In our times we know this because we kiss each other.
- Many microbes can be found in the mouth of the mother.
- With the pulp, the mother transmits her special microbes to the child, which carries them for the rest of it's lifetime.
- Some sort of health inoculation.
- Because the child receives the mother's microbes, the beneficial microbes, it is best protected.

## Modern times.

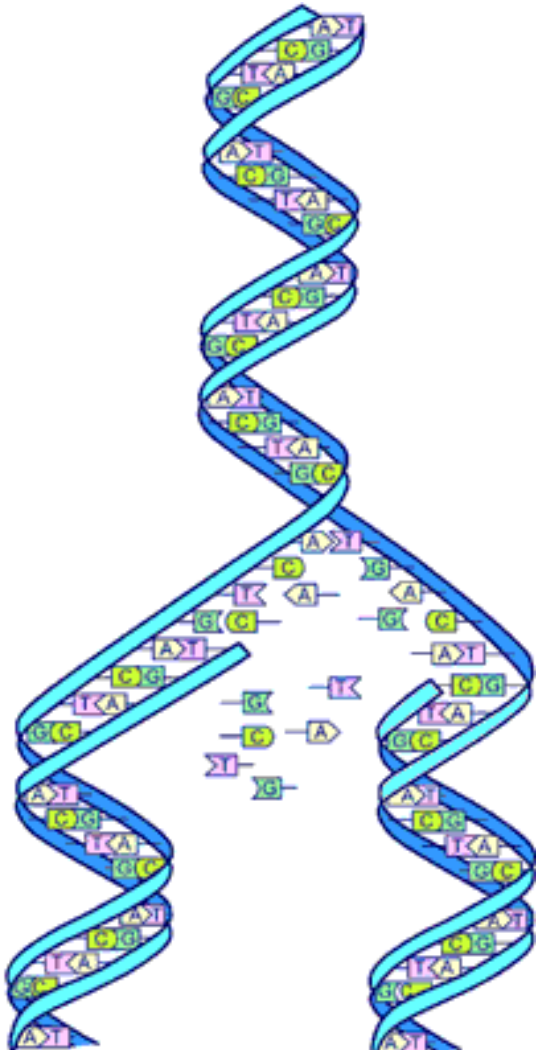


Pätzold, Ralf, Commons:Bundesarchiv & Curtis Newton, CC-BY-SA-3.0-DE

- What happens today?
- Birth by Caesarean/Cesarian section = no contact with the mother's microbes in the birth canal! No protection.
- Bottle feeding = no contact with mother's microbes at the nipples – no protection from mother.
- baby food = again: no contact with mother's microbes.
  
- The small child is germ-free and is send out into the world full of microbes without the mother's microbial protection shield.
  
- Consequences?
  - Immune system is weakened
  - Allergies
  - Gets infected.
  - Many following problems because of non-beneficial microbes taking over!
  
- Birth in a hospital = a hospital is full of pathogenic microbes, what a place to give birth!



## Microbial heritage.



- The child not only inherits the genes of mother and father.
  - In addition the child inherits the genes of it's mother!
  - The microbes living in mother and child are genetically related.
  - Other families – other microbe genetics!
  - You might care the same microbe species as other people, but you can be identified by the genes of your personal microbes you've got from your mother.
  - Microbes accompany your family through the centuries!
- What gets lost in modern times?

**Fragen an:**

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