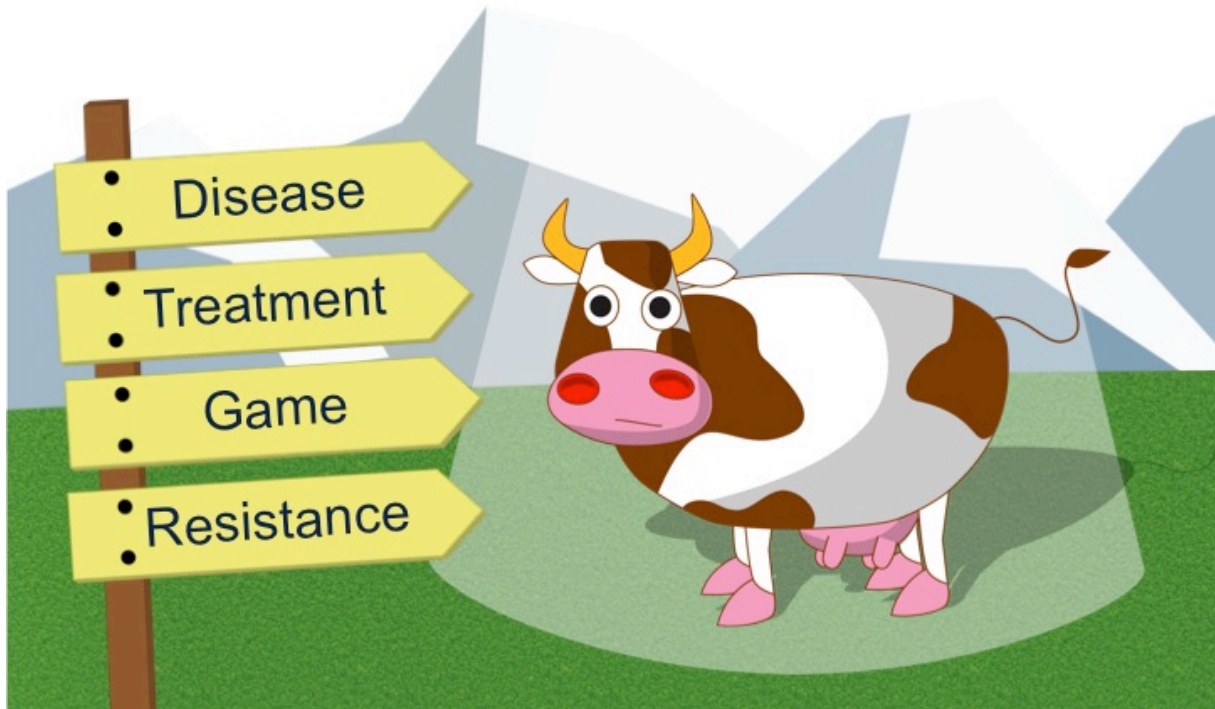


# Battle for Cattle



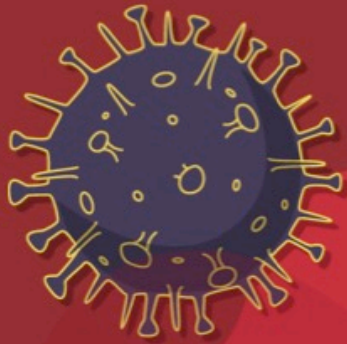
## Battle for Cattle - Further Background and Information

Here is some more information about what the game is about. The links for different topics lead to Wikipedia pages – so please have a look at the translations in your language!

Biofaction KG  
August 2019, Vienna, Austria  
battleforcattle [at] biofaction [dot] com

# Pathogens

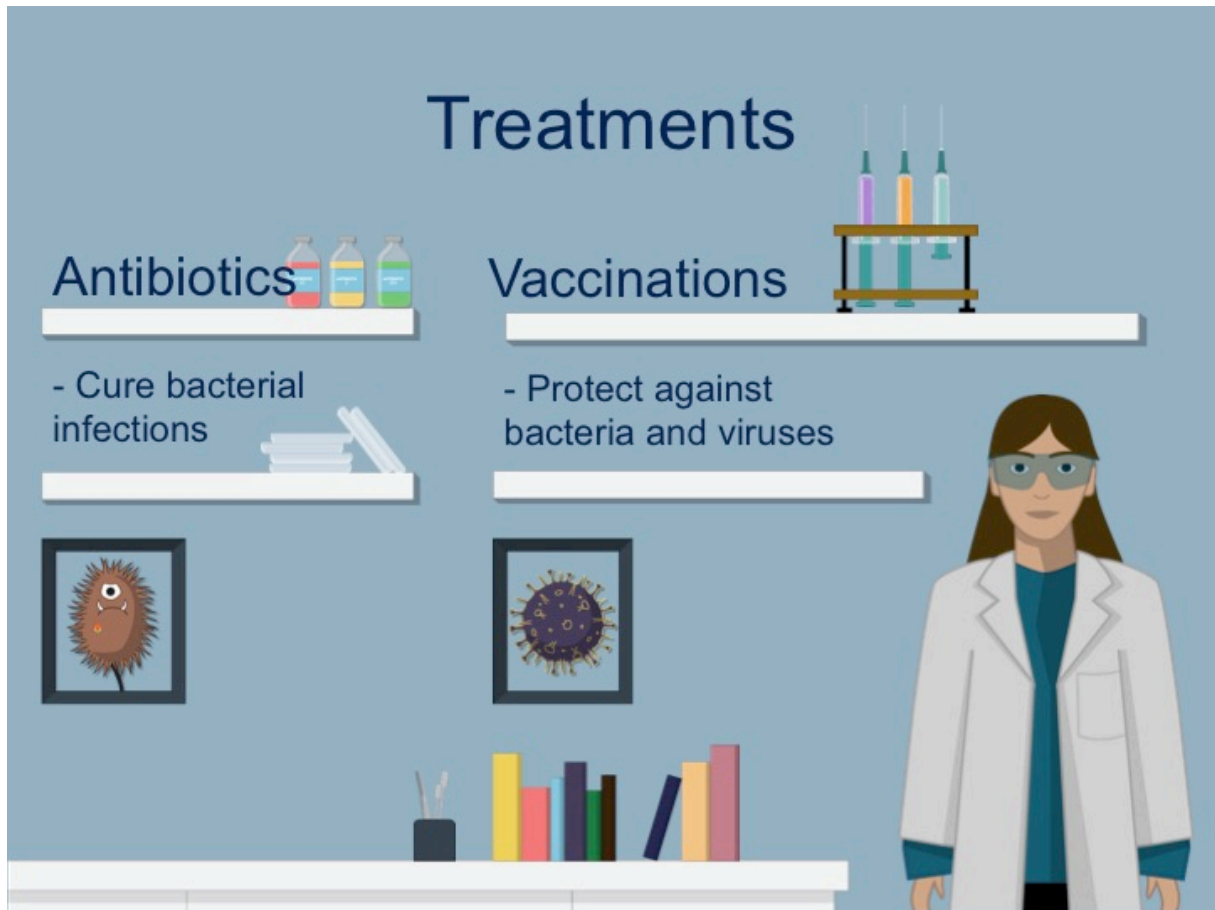
Viruses



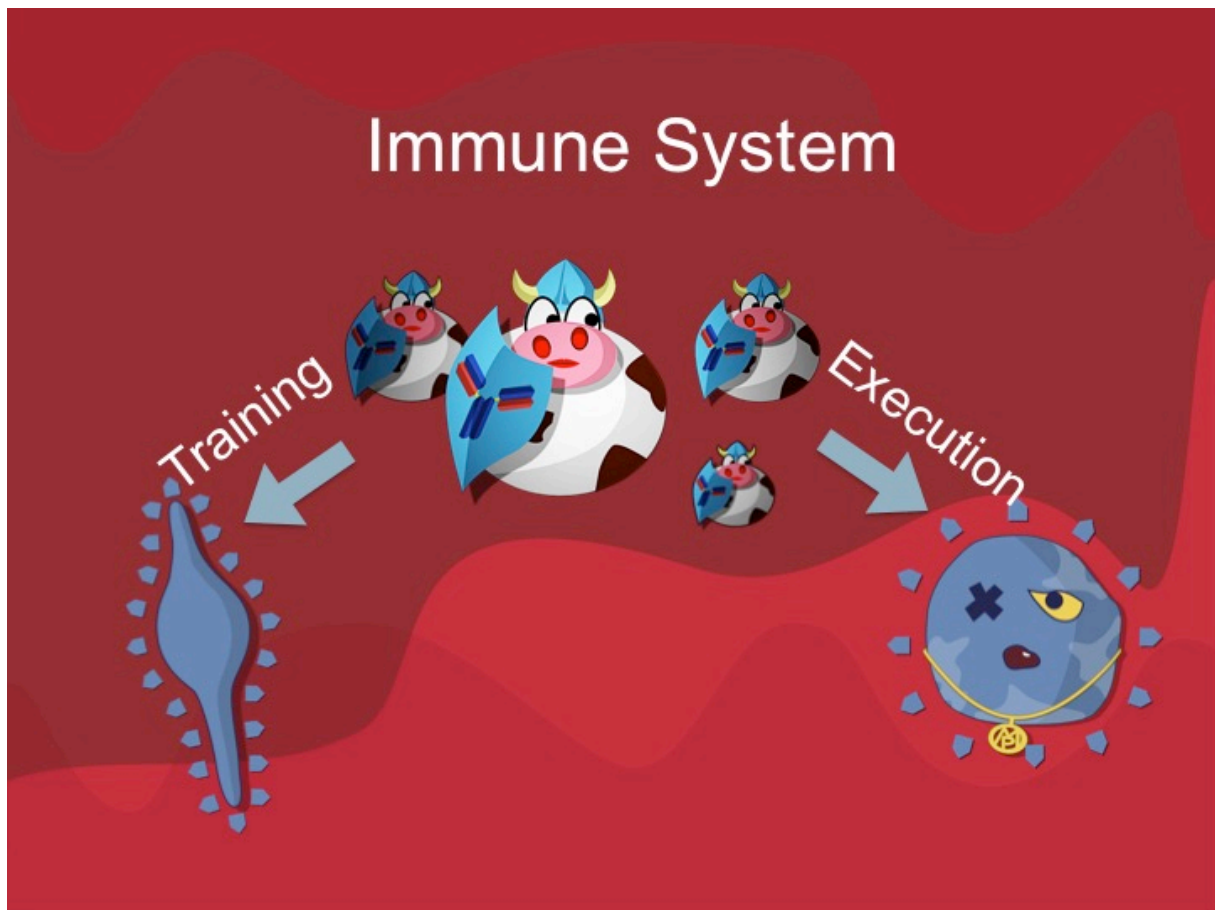
Bacteria



We and all animals can get ill by viruses (<https://en.wikipedia.org/wiki/Virus>) and bacteria (<https://en.wikipedia.org/wiki/Bacteria>), which are very different. Viruses are much smaller than bacteria and not even considered alive.



Bacteria can normally be treated with antibiotics (<https://en.wikipedia.org/wiki/Antibiotic>), viruses cannot be treated. However, we can become immune ([https://en.wikipedia.org/wiki/Immune\\_system](https://en.wikipedia.org/wiki/Immune_system)) to a virus after we've been infected once, or after we've been vaccinated (<https://en.wikipedia.org/wiki/Vaccine>) for that specific virus.

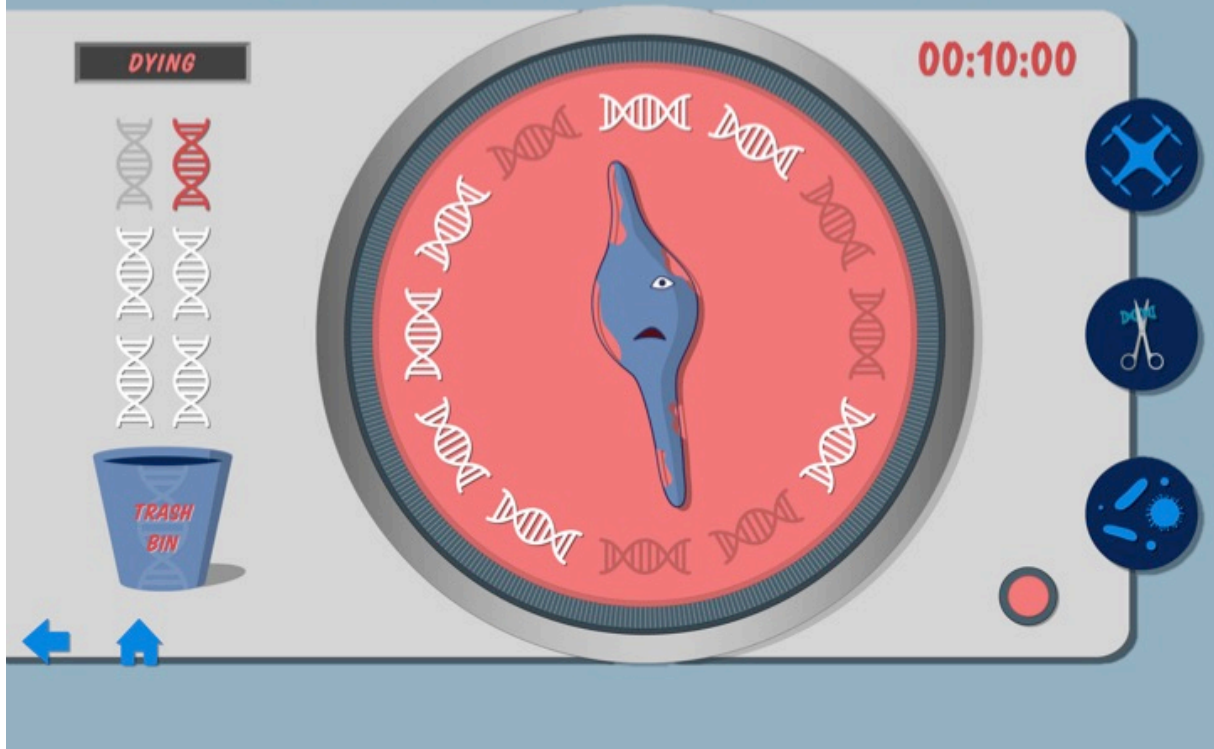


In this game, you deal with *Mycoplasma* (<https://en.wikipedia.org/wiki/Mycoplasma>), a specific bacteria that, unlike most, does not have a cell wall. Many antibiotics destroy the cell wall of a bacteria and thereby kill the bacteria. This is not possible with *Mycoplasma*, as it does not have one. That's why antibiotics are not effective against it.

To combat *Mycoplasma*, the MycoSynVac research project (<https://www.mycosynvac.eu/>) wants to develop a 'synthetic vaccine'.

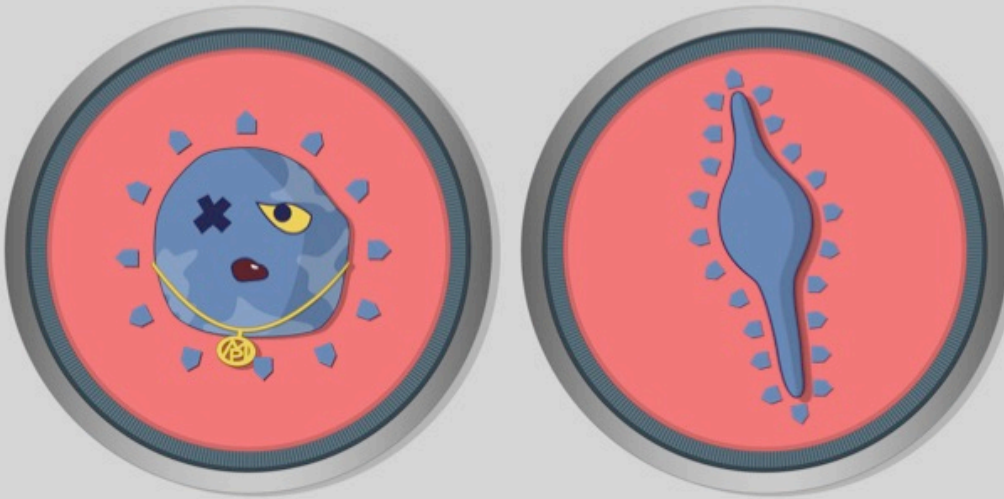
Normally, vaccines are based on weak or dead viruses to train your immune system for when the real virus strikes. The immune system learns to recognize the virus by recognizing 'receptors' (more specifically, so-called 'epitopes') on the surface of the virus.

# How to make a vaccine?



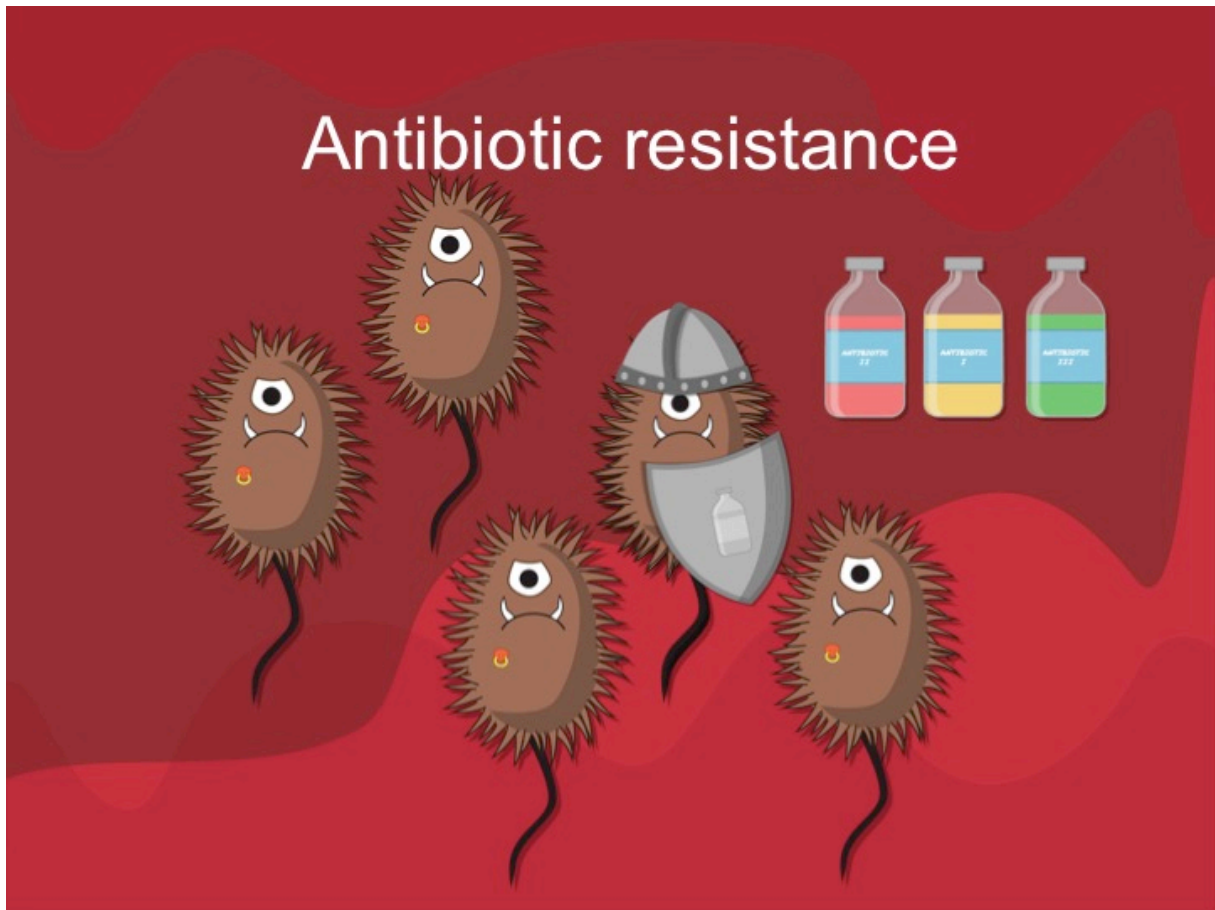
In the case of the MycoSynVac synthetic vaccine, scientists design a harmless vaccine chassis based on *Mycoplasma pneumoniae*. Usually, this bacteria is also harmful, but by deleting some parts of its genetic material (DNA <https://en.wikipedia.org/wiki/DNA>) this bacteria can be converted to a minimal organism and used as a chassis for a vaccine.

## How to make a vaccine?



Next, the scientists take the DNA that codes for the receptors from *Mycoplasma bovis*, a bacteria that infects cows and isn't easily treated by antibiotics. This DNA is placed into the chassis. That means that the chassis (formerly known as *Mycoplasma pneumoniae*) gets the same receptors.

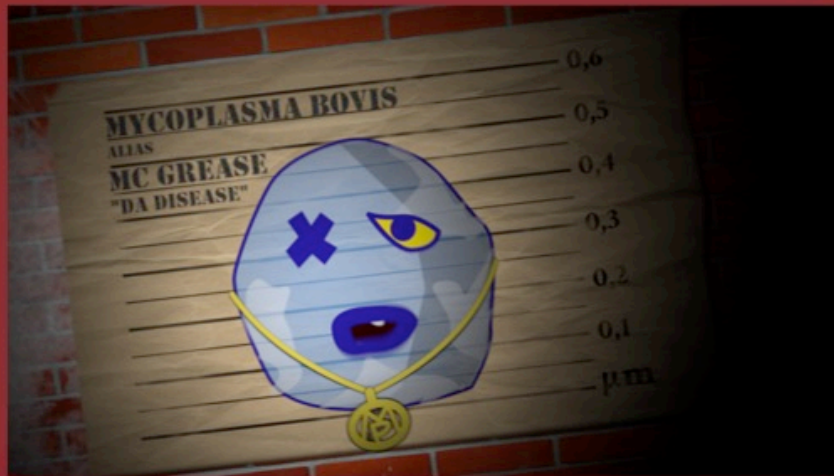
This harmless chassis with the receptors of the pathogen can be used to train the immune systems of the cows.



In 'Battle for Cattle', you also encounter what happens when antibiotics are overused. All bacteria can grow resistant against any antibiotic, thereby making the antibiotic useless. This often happens when antibiotics are not used correctly or are used too often.

The research done by MycoSynVac should allow researchers to make vaccines for any kind of bacteria, thereby partly solving the problem of antibiotic resistance.

# MC Grease Da disease



If you'd like to have a look at a hilarious music video that further discusses these issues – specifically from the perspective of *Mycoplasma bovis*, nicknamed MC Grease Da Disease, check it out here:

<https://www.youtube.com/watch?v=uY60ijZZX1o>

Finally, here's a list of all the links we used in the text:

DNA: <https://en.wikipedia.org/wiki/DNA>

Viruses: <https://en.wikipedia.org/wiki/Virus>

Bacteria: <https://en.wikipedia.org/wiki/Bacteria>

*Mycoplasma*: <https://en.wikipedia.org/wiki/Mycoplasma>

*Mycoplasma Pneumoniae*:

[https://en.wikipedia.org/wiki/Mycoplasma\\_pneumoniae](https://en.wikipedia.org/wiki/Mycoplasma_pneumoniae)

*Mycoplasma Bovis*: [https://en.wikipedia.org/wiki/Mycoplasma\\_bovis](https://en.wikipedia.org/wiki/Mycoplasma_bovis)

Immune system: [https://en.wikipedia.org/wiki/Immune\\_system](https://en.wikipedia.org/wiki/Immune_system)

Vaccine: <https://en.wikipedia.org/wiki/Vaccine>

Antibiotic: <https://en.wikipedia.org/wiki/Antibiotic>

Antibiotic resistance: [https://en.wikipedia.org/wiki/Antimicrobial\\_resistance](https://en.wikipedia.org/wiki/Antimicrobial_resistance)

MycoSynVac project: <https://www.mycosynvac.eu/>