

# Moderní technologie a bezpečnost

Biotechnologie a genetika

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# Španělská chřipka

- 1918-1919
- světová populace cca 1.75 bil. (WW1)
- První světová válka: 15-20 mil. mrtvých
- Španělská chřipka: 20-100 mil. mrtvých
- Druhá světová válka: 40-100 mil. mrtvých



# IN BELGOROD BEGAN TO POISON PIGEONS BECAUSE OF THE THREAT OF “BIOLOGICAL WEAPONS” FROM UKRAINE



# Bioterorismus

- Ražníš/Osho (1984)



# Bioterorismus

- Ražniš/Osho (1984)
- オウム真理教 (1990-5)



# Bioterrorismus

- Ražniš/Osho  
(1984)
- オウム真理教  
(1990-5)
- Bruce Ivins  
(2001)

09-11-01  
YOU CAN NOT STOP US.  
WE HAVE THIS ANTHRAX.  
YOU DIE NOW.  
ARE YOU AFRAID?  
DEATH TO AMERICA.  
DEATH TO ISRAEL.  
ALLAH IS GREAT.

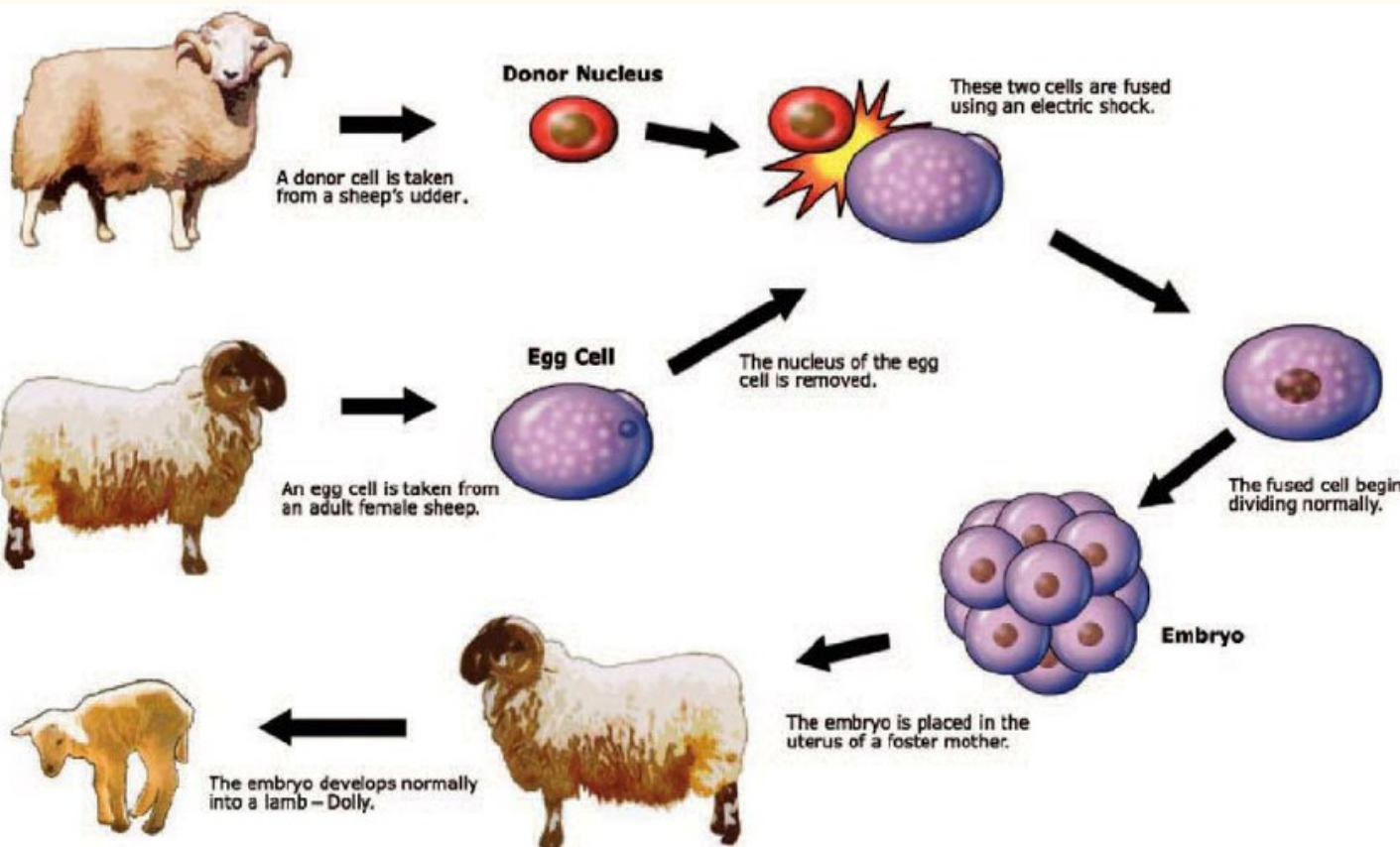
09-11-01  
THIS IS NEXT  
TAKE PENACILIN NOW  
DEATH TO AMERICA  
DEATH TO ISRAEL  
ALLAH IS GREAT.

# Antibiotika

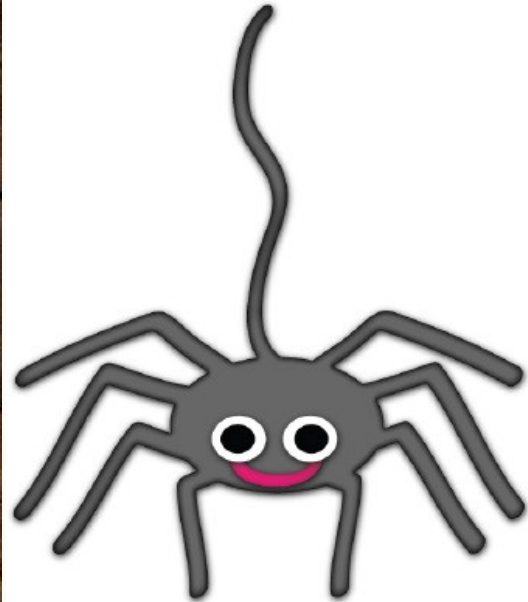
- objeveny 1928, nasazení od WW2
- problém zvyšující se rezistence kvůli nadužívání
- <https://www.youtube.com/watch?v=plV4k4NVIUh8>
- vývoj nových antibiotik extrémně pomalý
- bakteriofágy?

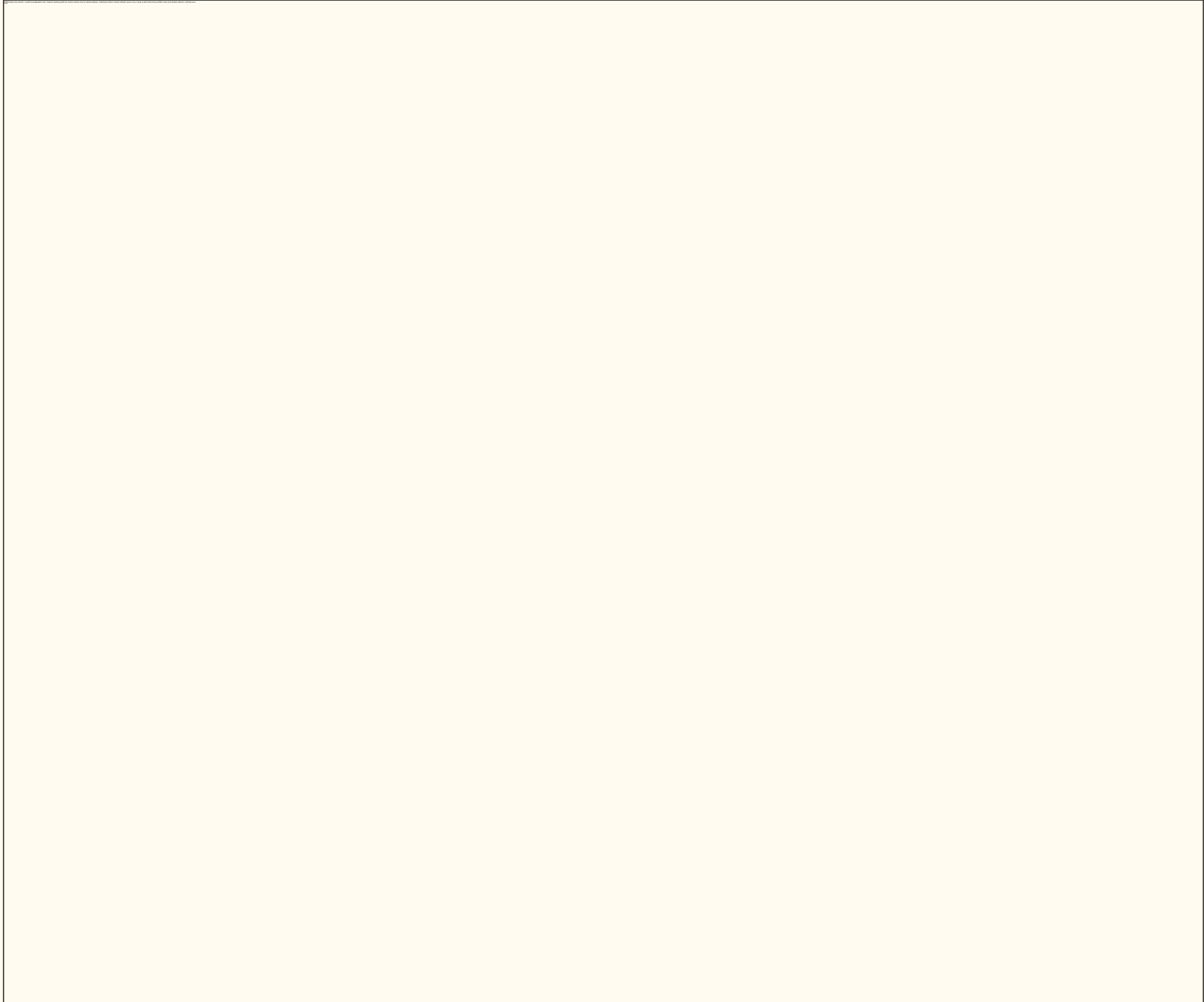












A man with dark hair, wearing a light-colored vertically striped button-down shirt and a red lanyard, stands behind a wooden podium. He is looking slightly to his left with a neutral expression. A microphone is positioned in front of him. A laptop is open on the podium behind the sign. The background is a warm, reddish-brown wall.

SECOND INTERNATIONAL SUMMIT ON  
HUMAN GENOME EDITING



The Academy of Sciences  
of Hong Kong 香港科學院

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# How Crops are Genetically Modified

## Traditional Breeding

Crossing plants and selecting offspring



Desired gene(s) inserted with other genetic material

Almost all crops

## Mutagenesis

Exposing seeds to chemicals or radiation

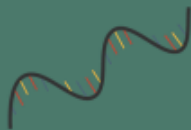


Random changes in genome, usually unpredictable



## RNA Interference

Switching off selected genes with RNA



Targeted gene(s) switched off or 'silenced'



## Transgenics

Inserting selected genes using recombinant DNA methods



Only gene(s) inserted at desired locations selected



## Gene Editing

When used to delete genes using engineered nucleases (CRISPR, TALENs, ZFNs, etc.)



Desired gene(s) deleted only at known locations



### Number of genes affected:

few genes to whole genomes

100s - 1,000s

1 - dozens

1 - 8

1 or more

No safety testing required;  
**Unregulated**

No safety testing required;  
**Unregulated**

Safety testing required;  
**Highly regulated**

Safety testing required;  
**Highly regulated**

Safety testing required  
depending on jurisdiction;  
**Mixed regulations**

**Undesirable, unintended effects rarely occur in the final product of any crop, regardless which process is used.**

# Kontroverze

- umělé orgány
- syntetické organismy
- genome editing
- modifikace virů
- gene drive

