schimmels

Gisten – bier, brood, kaas
Schimmels – antibiotica
Paddestoelen – eten, halucinogene middelen

Verspreiding en voortplanting
- mycelium (door medium, meerdere substraten)
- sporen (door lucht)

mycelium

Invasieve groei

sporen

Aerogene verspreiding

fungi

2 to 4 μm , and some species release fragments of 0.3 to 1.3 μm

Mucormycosis

YOUR HEALTH / The Truth About COVID-19 And Black Fungus

The novel coronavirus has recently been linked to two serious fungal infections: COVID-19 associated pulmonary aspergillosis (CAPA) and COVID-19 associated mucormycosis (CAM).[1] The resurgence of these rare fungal infections has medical personnel concerned.

A 2021 study found that more than 47,000 cases of CAM were reported in just three months in India. And with the Delta variant spreading worldwide, reports suggest that the number of cases is likely much higher.[2]

Aspergillosis and mucormycosis, which is often, mistakenly, referred to as "black fungus", existed before COVID-19, though it is rare and primarily affects people with severe illnesses—such as bone marrow transplants or acute myeloid leukemia—and people in the ICU with damage to the lungs.[3] However, it has been exacerbated with COVID-19.[1,4]

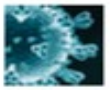
Common misconceptions

The term "black fungus" has been used by the public to describe mucormycosis; however, according to Jay Aram, MD, Global Medical Affairs Lead, Anti Infectives at Pfizer, black fungus is actually a different category of fungus that is not associated with CAPA or CAM. Instead of black fungus, the medical community prefers to use "mucor fungi."

Another common misconception of CAPA and CAM is that they are contagious.[3] "This is not true," says Aram. "These infections develop due to exposure to the fungal the spores—primarily in the air. People do not produce these spores and cannot spread them to others."

What are CAPA and CAM?

CAPA and CAM are opportunistic secondary infections caused by fungi in patients with severe COVID-19. According to Aram, these infections are considered opportunistic because they are more common in people with an impaired immune system or who have developed lung damage such as acute respiratory distress syndrome.



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How to stay saf
spread.

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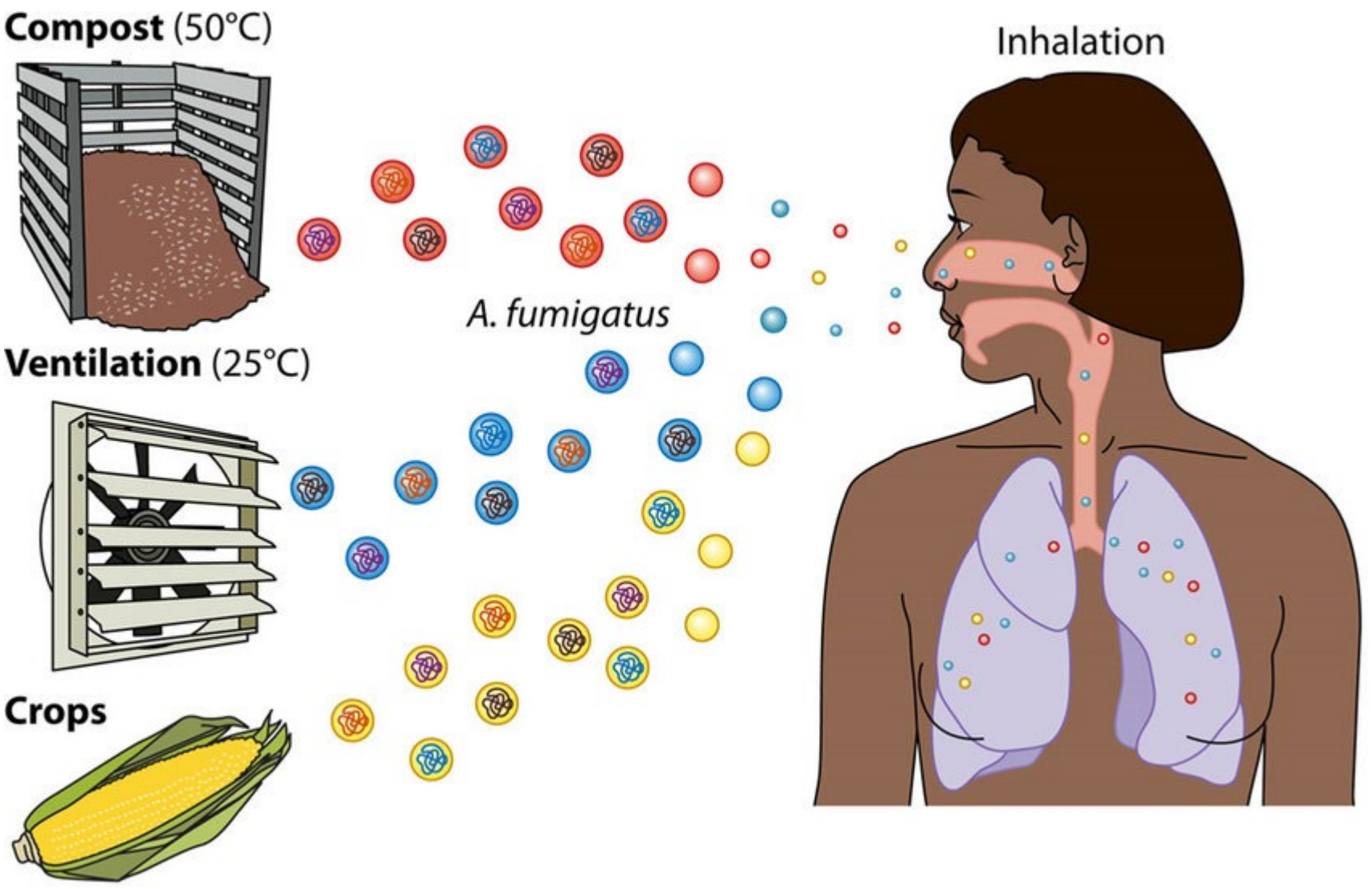


Factors: temperature, nutrients, pH, humidity, interaction with other microbes, etc.

aspergillus

Invasieve schimmelinfecties bij influenza en COVID-19

euws › Invasieve schimmelinfecties bij influenza en COVID19

29 juni 2020

In de longen van veel COVID-patiënten op de IC wordt de Aspergillus schimmel aangetroffen. Een parallel dringt zich op met influenzapatiënten op de IC, die vaak een ernstige schimmelinfectie ontwikkelen. Op basis van de eerste gegevens lijkt zo'n ernstige schimmelinfectie bij COVID-patiënten echter minder vaak voor te komen maar alertheid blijft geboden, schrijven onderzoekers van het Radboudumc in The Lancet Microbe.

Patiënten die met een ernstige griep worden opgenomen op de Intensive Care (IC),

Aspergillosis

Español (Spanish)

Aspergillosis is an infection caused by *Aspergillus*, a common mold (a type of fungus) that lives indoors and outdoors. Most people breathe in *Aspergillus* spores every day without getting sick. However, people with weakened immune systems or lung diseases are at a higher risk of developing health problems due to *Aspergillus*. The types of health problems caused by *Aspergillus* include allergic reactions, lung infections, and infections in other organs.

Select regional labs in the AR Lab Network perform screening to monitor and track the emergence of azole-resistant *A. fumigatus* in the United States.

Aspergillus infections have been reported in patients with severe influenza. Click here to learn more.

About

Symptoms

Risk & Prevention

Symptoms of Aspergillosis

Español (Spanish)

The different types of aspergillosis can cause different symptoms.[1]

The symptoms of **allergic bronchopulmonary aspergillosis (ABPA)** are similar to asthma symptoms, including:

- Wheezing
- Shortness of breath
- Cough
- Fever (in rare cases)

Symptoms of **allergic *Aspergillus* sinusitis**[2] include:

- Stuffiness
- Runny nose
- Headache
- Reduced ability to smell

Symptoms of an **aspergilloma** ("fungus ball")[3] include:

- Cough
- Coughing up blood

Invasive aspergillosis[1] usually occurs in people who are already sick from other medical conditions, so it can be difficult to know which symptoms are related to an *Aspergillus* infection. However, the symptoms of invasive aspergillosis in the lungs include:

- Fever
- Chest pain
- Cough
- Coughing up blood
- Shortness of breath
- Other symptoms can develop if the infection spreads from the lungs to other parts of the body.

Fever is a common symptom of invasive aspergillosis.

Contact your healthcare provider if you have symptoms that you think are related to any form of aspergillosis.

Treatment for Aspergillosis

Español (Spanish)

Type of aspergillosis	Examples	Recommended Treatment
Allergic aspergillosis	• Allergic bronchopulmonary aspergillosis (ABPA) • Allergic *Aspergillus* sinusitis	• Itraconazole • May consider corticosteroids
Invasive aspergillosis	• Invasive aspergillosis • Cutaneous aspergillosis • Chronic pulmonary aspergillosis	• Voriconazole • Other options: lipid amphotericin formulations, posaconazole, isavuconazole, itraconazole, caspofungin, and micafungin
Aspergilloma		• May include surgery and/or antifungal medications

Treatment for invasive and cutaneous aspergillosis: When possible, immunosuppressive medications should be discontinued or decreased. People with severe cases of aspergillosis may need surgery.

Expert guidance is needed for infections not responding to treatment, including antifungal-resistant infections.


Prevent Mold and Mildew In Your Home
1. Improve air flow through your rooms.
2. Use exhaust fans.
3. Use central air conditioning or a dehumidifier.
4. Fix any leaks.
5. Remove sources of dampness.
6. Make sure rainwater drains away from your house.
aafa
Asthma and Allergy
Foundation of America
www.aafa.org

Sommige lieveheersbeestjes (Coccinellidae) leven van schimmels, een voorbeeld is het meeldauwlieveheersbeestje (*Halyzia sedecimguttata*), dat van de schimmel meeldauw leeft. Doordat de schimmelsporen aan de kever blijven plakken, is het niet alleen een vijand van de schimmel maar ook een belangrijke verspreider.

Verschillende groepen van mieren kweken schimmels uit de orde Agaricales als hun belangrijkste bron van voedsel.

Parasitaire schimmels [bewerken | brontekst bewerken]

Meloidogyne incognita-eitjesmassa geparasiteerd door een schimmel

Veel schimmels leven van dood plantaardig materiaal, er zijn echter ook schimmels die levend plantaardig of dierlijk materiaal als voedsel gebruiken: ze leven als parasieten op planten of insecten (entomopathogene schimmels). Parasitaire schimmels die vooral op zwakke of oude organismen groeien worden zwakteparasieten genoemd. De infectie, mycose genoemd, kan bij de gastheer ernstige ziekten veroorzaken en zorgen dat hij gedeeltelijk of geheel afsterft. Bomen die gevoelig zijn voor schimmelinfecties zijn bijvoorbeeld iepen of kastanjes.

In de land- en tuinbouw kunnen grootschalige schimmelinfecties voor mislukte oogsten zorgen. Voorbeelden van economisch schadelijke parasitaire schimmels zijn builenbrand (*Ustilago maydis*) op mais, steenbrand (*U. hordei*) op tarwe en gerst, moederkoorn (*Claviceps purpurea*) op rogge en tarwe, de verwelkingszwam (*Verticillium*) op loofbomen als laurierkers (veroorzaakt de verwelkingsziekte), de schurftschimmel (*Venturia inaequalis*) op onder andere appelbomen (veroorzaakt schurft), perenroest (*Gymnosporangium fuscum*) op met name jeneverbessen, het meniezwammetje (*Nectria cinnabarina*), dat vormen van boomkanker bij diverse bomen veroorzaakt of meeldauw (Erysiphaceae) op veel verschillende soorten planten.

Slanke driehoekszweefvlieg besmet door *Entomophthora muscae*, een entomopathogene schimmel

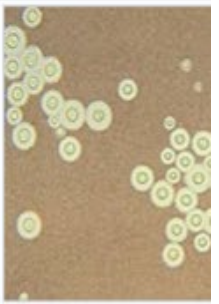
straling

Radiotrophic fungus

From Wikipedia, the free encyclopedia

This article **needs additional citations for verification**. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.

Find sources: "Radiotrophic fungus" – news · newspapers · books · scholar · JSTOR *(February 2014) (Learn how and when to remove this template message)*



Cryptococcus neofor
with light India ink

Radiotrophic fungi are fungi that can use radiation as an energy source to stimulate growth. Radiotrophic fungi have been found in extreme environments such as in the Chernobyl Nuclear Power Plant.

Most known radiotrophic fungi utilize melanin in some capacity to survive.[1] The process of using radiation and melanin for energy has been termed radiosynthesis, and is thought to be analogous to anaerobic respiration.[2] However, it is not known if multi-step processes such as photosynthesis or chemosynthesis are used in radiosynthesis.

Contents [hide]

Discovery [edit]

Radiotrophic fungi were discovered in 1991 growing inside and around the Chernobyl Nuclear Power Plant.[3] It was specifically noted that colonies of m

S. cerevisiae

nature

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Article | Published: 04 May 2020

Rapid reconstruction of SARS-CoV-2 using a synthetic genomics platform

Tran Thi Nhu Thao, Fabien Labroussaa, [...] Volker Thiel ✉

Nature **582**, 561–565 (2020) | Cite this article

124k Accesses | **109** Citations | **1248** Altmetric | Metrics

Abstract

Reverse genetics has been an indispensable tool to gain insights into viral pathogenesis and vaccine development. The genomes of large RNA viruses, such as those from coronaviruses, are cumbersome to clone and manipulate in *Escherichia coli* owing to the size and occasional instability of the genome[1,2,3]. Therefore, an alternative rapid and robust reverse-genetics platform for RNA viruses would benefit the research community. Here we show the full functionality of a yeast-based synthetic genomics platform to genetically reconstruct diverse RNA viruses, including members of the *Coronaviridae*, *Flaviviridae* and *Pneumoviridae* families. Viral subgenomic fragments were generated using viral isolates, cloned viral DNA, clinical samples or synthetic DNA, and these fragments were then reassembled in one step in *Saccharomyces cerevisiae* using transformation-associated recombination cloning to maintain the genome as a yeast artificial chromosome. T7 RNA polymerase was then used to generate infectious RNA to rescue viable virus. Using this platform, we were able to engineer and generate chemically synthesized clones of the virus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)[4], which has caused the

Protocol: Real-time RT-PCR assays for the detection of SARS-CoV-2, Institut Pasteur, Paris

SPECIFICITY

Cross-reactivity with other respiratory viruses was tested with specimens known to be positive for a panel of respiratory viruses (influenza A(H1N1)pdm09, A(H3N2), B-Victoria, B-Yamagata; influenza C; RSV A, B; hBoV; hPIV; hMPV; HRV/enterovirus; adenovirus; hCoV (HKU1, OC43, 229E and NL63); MERS-CoV. None of the tested viruses showed reactivity with PCR2 and PCR4.

POSITIVE CONTROL FOR SARS-CoV-2 REAL-TIME RT-PCR

One specific control has been designated.

Positive control for real-time RT-PCR is an *in vitro* transcribed RNA derived from strain BetaCoV_Wuhan_WIV04_2019 (EPI_ISL_402124). The transcript contains the amplification regions of the ***RdRp*** *and* ***E gene*** as positive strand. Each microtube contains 10^{11} copies of target sequences diluted in yeast tRNA, and lyophilised.

Reconstitution of transcribed RNA

Add 100 µl of RNase/DNAse-free H2O to obtain a solution at a concentration of 10^9 copies/µl. Store at -80°C. Dilute to prepare a master bank at $2x10^6$ copies/µl. Store at -80°C.
From this prepare a working bank of reagent at $2x10^4$ copies/µl in order to avoid freeze/thaw cycles. Working tubes may be stored at -20°C for less than one week.

Positive controls are available upon request (grippe@pasteur.fr)

Aknowledgements

We gratefully acknowledge the Authors, the Originating and Submitting Laboratories for their sequence and metadata shared through GISAID (EPI_ISL_402119; EPI_ISL_402121; EPI_ISL_402120; EPI_ISL_402123; EPI_ISL_402124; EPI_ISL_402125).

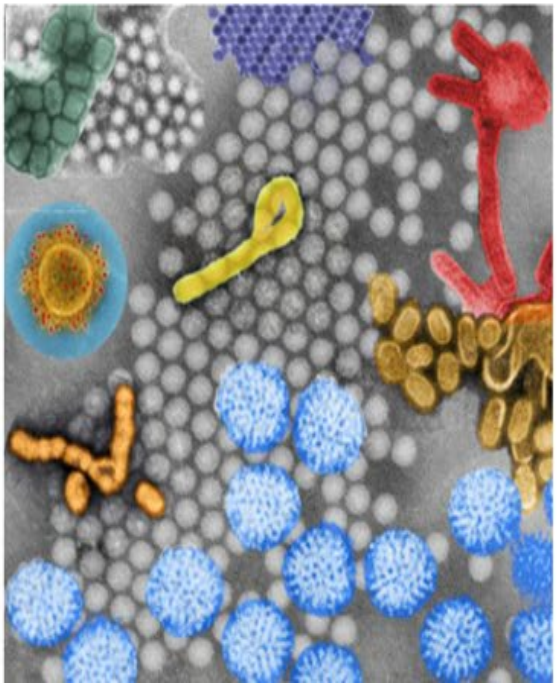
Reference

1- Corman VM, Landt O, Kaiser M, et al. Detection of 2019 novel coronavirus (2019-nCoV) by real-time

Virus

Human 2019-nCoV - hCoV-19/France/HDF-IPP11602i/2021, clade 21A/B.1.617.2

REFERENCE STRAIN



Product **Description**

Platinum RG3

Ref-SKU: *017V-04400*

Infectious cell culture supernatant of human 2019-nCoV, clade 21A/B.1.617.2

Product Risk Group: RG3

ICTV Taxonomy:

Riboviria / Orthornavirae / Pisuviricota / Pisoniviricetes / Nidovirales / Cornidovirineae / Coronaviridae / Orthocoronavirinae / Betacoronavirus / Sarbecovirus / Severe acute respiratory syndrome-related coronavirus

Virus name: SARS-CoV-2

Genotype: clade 21A

Variant: 20A/452R (B.1.617)

Storage conditions: Viral Storage Medium -80C

communication

SCIENCE

Squirrels Are Professional Eavesdroppers

Listening in on birds could help the bushy-tailed rodents know if they're in da

LINDA POON AND CITYLAB SEPTEMBER 29, 2019

Image courtesy Urasimaru, Flickr (CC BY-NC 2.0).

Understanding chemical communication in ant societies

The colony of the humble ant is an interlaced web of information. With the help of supercomputing, science has recently come one step closer to understanding how such a colony manages to communicate.

Speed read

- Ants rely heavily on the use of chemical communication in the form of pheromones.
- A Japanese research team has analyzed the antennas of Japanese carpenter ants to find out the molecular processes behind this form of communication.
- Two chemosensory proteins (CSPs) were discovered that were expressed in the ants'

Posted on 17 FEB, 2016

David Lugmayer

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Plant Signaling & Behavior

Plant Signal Behav. 2012 Oct 1; 7(10): 1306–1320.
doi: 10.4161/psb.21663

PMCID: PMC3493419
PMID: 22895106

Mechanisms of plant defense against insect herbivores

Abdul Rashid War,[1,2] Michael Gabriel Paulraj,[3] Tariq Ahmad,[4] Abdul Ahad Buhroo,[4] Barkat Hussain,[5] Savarimuthu Ignacimuthu,[2] and Hari Chand Sharma[1,*]

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Abstract

Go to:

Plants respond to herbivory through various morphological, biochemicals, and molecular mechanisms to counter/offset the effects of herbivore attack. The biochemical mechanisms of defense against the herbivores are wide-ranging, highly dynamic, and are mediated both by direct and indirect defenses. The defensive compounds are either produced constitutively or in response to plant damage, and affect feeding, growth, and survival of herbivores. In addition, plants also release volatile organic compounds that attract the natural enemies of the herbivores. These strategies either act independently or in conjunction with each other. However, our understanding of these defensive mechanisms is still limited. Induced resistance could be exploited as an important tool for the pest management to minimize the amounts of insecticides used for pest control. Host plant resistance to insects, particularly, induced resistance, can also be manipulated with the use of chemical elicitors of secondary metabolites, which confer resistance to insects. By understanding the mechanisms of induced resistance, we can predict the herbivores that are likely to be affected by induced responses. The elicitors of induced responses can be sprayed on crop plants to build up the natural defense system against damage caused by herbivores. The induced responses can also be engineered genetically, so that the defensive compounds are constitutively produced in plants against are challenged by

Battling bubbles: How plants protect themselves from killer fungus

UCR researchers show how plants fight against infections by delivering protective molecules into fungi using bubble-like exosomes

AUTHOR:
SARAH NIGHTINGALE

In the battle between plants and pathogens, molecules called small RNAs are coveted weapons used by both invaders and defenders.

In a paper published Thursday (May 17) in the journal Science, researchers at the University of California, Riverside report how plants package and deliver the small RNAs, or sRNAs, they use to fight back against plant pathogens. The study focused on Botrytis cinerea, a fungus that causes a grey mold disease in almost all fruits,

Plant vesicles inspire methods to protect crops

Some studies have suggested that plants and fungi exchange RNA through extracellular vesicles. This has led some scientists to develop crop sprays that contain RNA.

By Roxanne Khamsi on June 17, 2020

Quorum sensing

From Wikipedia, the free encyclopedia
(Redirected from Quorum-sensing)

In biology, **quorum sensing** (or **quorum signalling**)[1] is the ability to detect and respond to cell population density by gene regulation. As one example, quorum sensing (QS) enables bacteria to restrict the expression of specific genes to the high cell densities at which the resulting phenotypes will be most beneficial. Many species of bacteria use quorum sensing to coordinate gene expression according to the density of their local population. In a similar fashion, some social insects use quorum sensing to determine where to nest. Quorum sensing may also be useful for cancer cell communications.[2]

In addition to its function in biological systems, quorum sensing has several useful applications for computing and robotics. In general, quorum sensing can function as a decision-making process in any decentralized system in which the components have: (a) a means of assessing the number of other components they interact with and (b) a standard response once a threshold number of components is detected.

Contents [hide]

Apoptosis

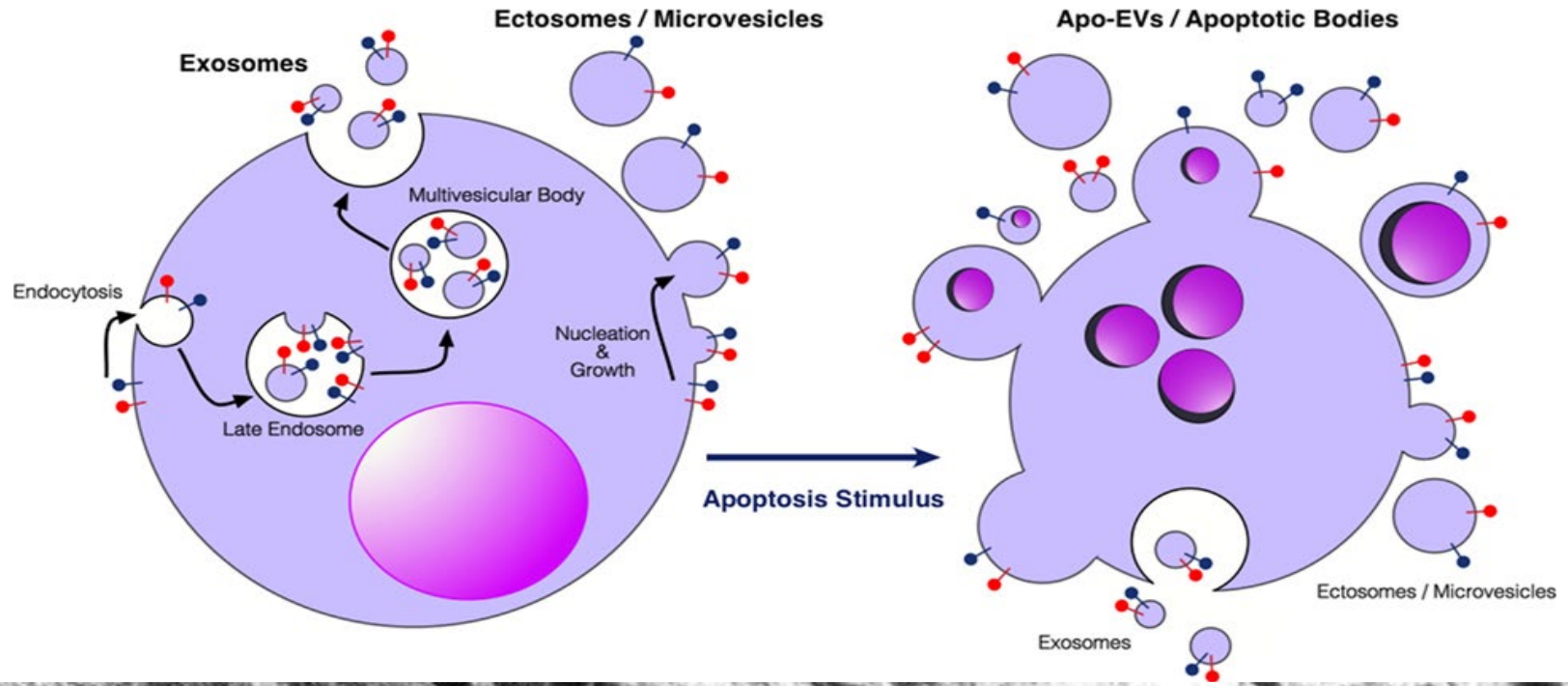
From Wikipedia, the free encyclopedia

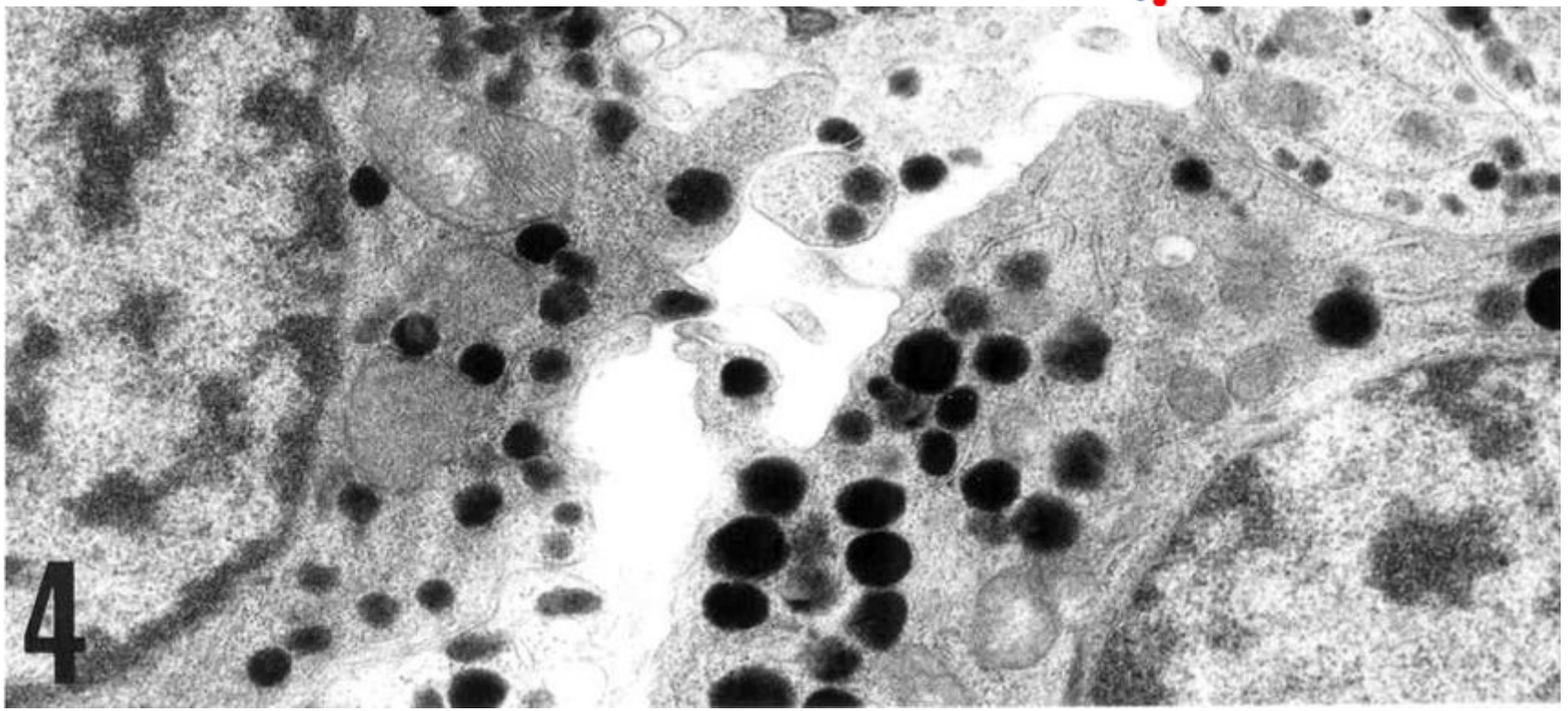
Apoptosis (from Ancient Greek ἀπόπτωσις, *apóptōsis*, 'falling off') is a form of programmed cell death that occurs in multicellular organisms.[1] Biochemical events lead to characteristic cell changes (morphology) and death. These changes include blebbing, cell shrinkage, nuclear fragmentation, chromatin condensation, DNA fragmentation, and mRNA decay. The average adult human loses between 50 and 70 billion cells each day due to apoptosis.[a] For an average human child between the ages of 8 and 14, approximately 20–30 billion cells die per day.[3]

In contrast to necrosis, which is a form of traumatic cell death that results from acute cellular injury, apoptosis is a highly regulated and controlled process that confers advantages during an organism's life cycle. For example, the separation of fingers and toes in a developing human embryo occurs because cells between the digits undergo apoptosis. Unlike necrosis, apoptosis produces cell fragments called apoptotic bodies that phagocytes are able to engulf and remove before the contents of the cell can spill out onto surrounding cells and cause damage to them.[4]

Because apoptosis cannot stop once it has begun, it is a highly regulated process. Apoptosis can be initiated through one of two pathways. In the *intrinsic pathway* the cell kills itself because it senses cell stress, while in the *extrinsic pathway* the cell kills itself because of signals from other cells. Weak external signals may also activate the intrinsic pathway of apoptosis.[5] Both pathways induce cell death by activating caspases, which are proteases, or enzymes that degrade proteins. The two pathways both activate initiator caspases, which then activate executioner caspases, which then kill the cell by degrading proteins indiscriminately.

In addition to its importance as a biological phenomenon, defective apoptotic processes have been implicated in a wide variety of diseases. Excessive apoptosis causes atrophy, whereas an insufficient amount results in uncontrolled cell proliferation, such as cancer. Some factors like Fas receptors and caspases promote apoptosis, while some members of the Bcl-2 family of proteins inhibit apoptosis.


Exosomes
Ectosomes / Microvesicles
Apo-EVs / Apoptotic Bodies
Multivesicular Body
Endocytosis
Nucleation
&
Growth
Late Endosome
Apoptosis Stimulus
Ectosomes / Microvesicles
Exosomes


4

exosoom

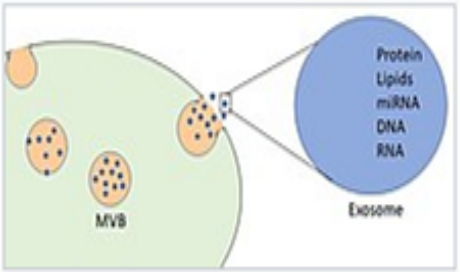
Exosome (vesicle)

From Wikipedia, the free encyclopedia

Not to be confused with Exosome complex.

This article **may be too technical for most readers to understand**. Please help improve it to make it understandable to non-experts, without removing the technical details. *(August 2020) (Learn how and when to remove this template message)*

Exosomes are membrane-bound extracellular vesicles (EVs) that are produced in the endosomal compartment of most eukaryotic cells.[1][2][3] The multivesicular body (MVB) is an endosome defined by intraluminal vesicles (ILVs) that bud inward into the endosomal lumen. If the MVB fuses with the cell surface (the plasma membrane), these ILVs are released as exosomes.



Exosomes are extracellular vesicles having a unique biogenesis pathway via multivesicular bodies.

In multicellular organisms, exosomes and other EVs were discovered in biological fluids including blood, urine and cerebrospinal fluid. Importantly, exosomes were also identified within the tissue matrix, coined Matrix-Bound Nanovesicles (MBV).[4] They are also released *in vitro* by cultured cells into their growth medium.[5][6][7] Since the size of exosomes is limited by that of the parent MVB, exosomes are generally thought to be smaller than most other EVs, from about 30 to 150 nanometres (nm) in diameter: around the same size as many lipoproteins but much smaller than cells.[5]

Compared with EVs in general, it is unclear whether exosomes have unique characteristics or functions or can be separated or distinguished effectively from other EVs.[1] EVs including exosomes carry markers of cells of origin and have specialized functions

CRISPR

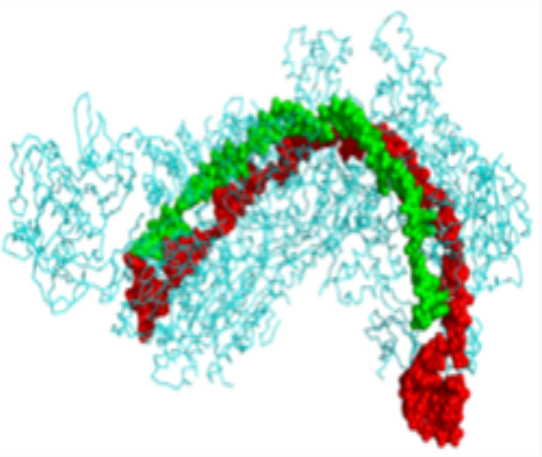
From Wikipedia, the free encyclopedia

This article is about the prokaryotic antiviral system. For the use in editing genes, see CRISPR gene editing.

CRISPR (/ˈkrɪspər/) (which is an acronym for **clustered regularly interspaced short palindromic repeats**) is a family of DNA sequences found in the genomes of prokaryotic organisms such as bacteria and archaea.[2] These sequences are derived from DNA fragments of bacteriophages that had previously infected the prokaryote. They are used to detect and destroy DNA from similar bacteriophages during subsequent infections. Hence these sequences play a key role in the antiviral (i.e. anti-phage) defense system of prokaryotes and provide a form of acquired immunity.[2][3][4][5] CRISPR are found in approximately 50% of sequenced bacterial genomes and nearly 90% of sequenced archaea.[6]

Cas9 (or "CRISPR-associated protein 9") is an enzyme that uses CRISPR sequences as a guide to recognize and cleave specific strands of DNA that are complementary to the CRISPR sequence. Cas9 enzymes together with CRISPR sequences form the basis of a technology known as CRISPR-Cas9 that can be used to edit genes within organisms.[8][9] This editing process has a wide variety of applications including basic biological research, development of biotechnological products, and treatment of diseases.[10][11] The development of the CRISPR-Cas9 genome editing technique was recognized by the Nobel Prize in Chemistry in 2020 which was awarded to Emmanuelle Charpentier and Jennifer Doudna.[12][13]

Cascade (CRISPR-associated complex for antiviral defense)

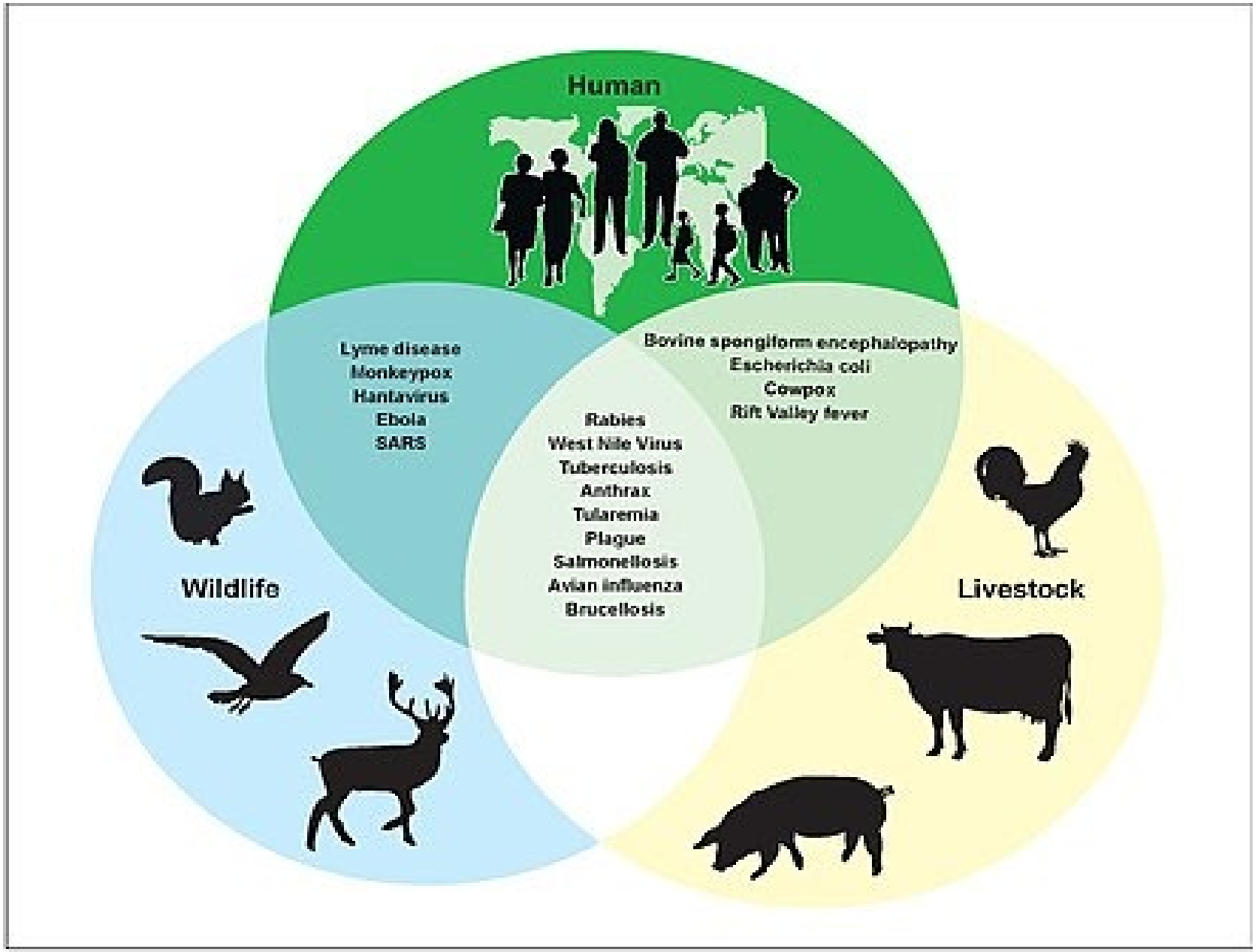


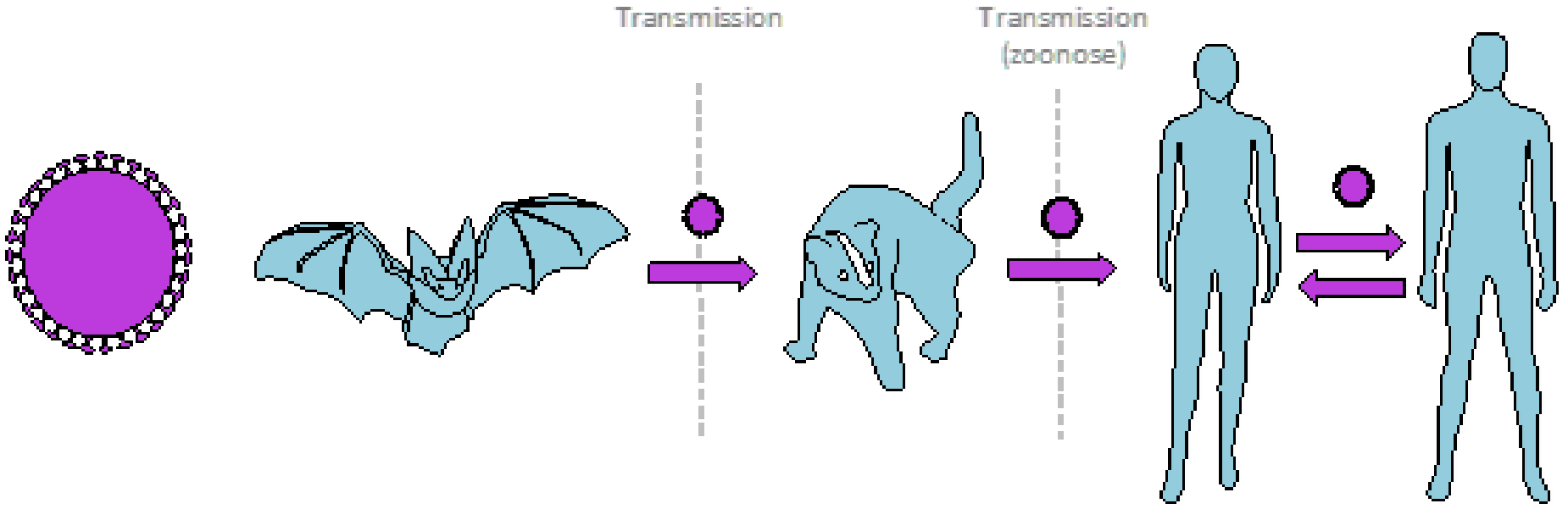
CRISPR Cascade protein (cyan) bound to CRISPR RNA (green) and phage DNA (red)[1]

Identifiers	
Organism	*Escherichia coli*
Symbol	CRISPR
PDB	4QYZ

Part of a series on

zoonose


Human
Lyme disease
Monkeypox
Hantavirus
Ebola
SARS
Bovine spongiform encephalopathy
Escherichia coli
Cowpox
Rift Valley fever
Rabies
West Nile Virus
Tuberculosis
Anthrax
Tularemia
Plague
Salmonellosis
Avian influenza
Brucellosis
Wildlife
Livestock
Source: GAO analysis of USGS data (data); Art Explosion (images).



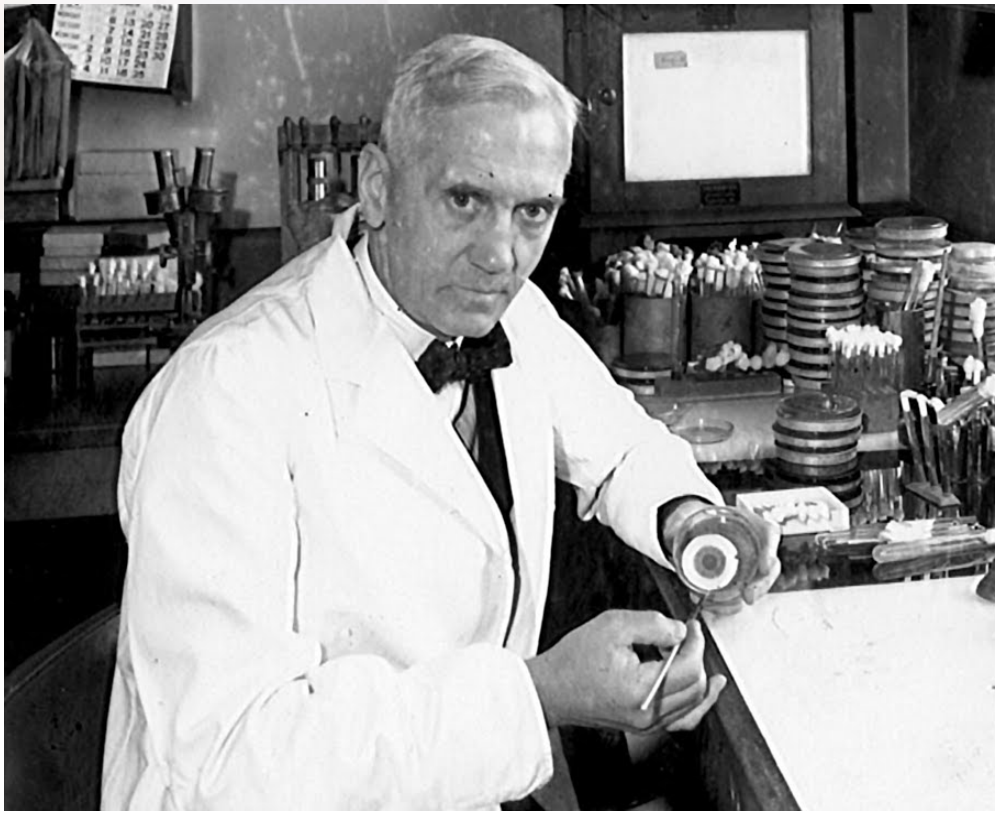
Virus
Coronavirus
SARS-CoV-1

Réservoir naturel
Chauve-souris

Hôte intermédiaire
Civette palmiste masquée

Transmission interhumaine


Amoxicilline/Clavulaanzuur Sandoz®
SANDOZ
20 FILMOMHULDE TABLETTEN
CIPROFLOXACINE 500 PCH
500
elke tablet bevat 500 mg ciprofloxacine (als hydrochloride)
KUUR GEHEEL AFMAKEN
DOXYCYCLINE dispergeerbaar ratiopharm 100 mg
tabletten
KUUR GEHEEL AFMAKEN
8 tabletten - voor oraal gebruik
ratiopharm



communication

DNA/RNA is a virtually universal language spanning over all life ,
enabling the most complex vertebrate to communicate with a single
cellular organism.
The modes of interaction.

-phase: saliva, aerosols, serum, etc. etc. can be compared to writing,
broadcasting, speaking

-the specific targets: receptors, tissue, organs, can be compared to distinct languages.

-the exposure, dose, duration, timing can be compared to interpunction.

explaining

- Response to external stimuli
- Asymptomatic 'spread'
- The 'viral shedding' after vaccination
- The testing positive after vaccination
- Similar symptoms from the vaccine as from the virus as from the original pathogen.

Function of vaccines

1. Vaccines against bacteria, fungi,
parasites can be highly useful as they mimic the original function of viruses.

2. Vaccines against viruses are probably highly ineffective
causing mismatches and disturbed communication.

3. Trying to reprogram the body to induce certain immune responses
through mRNA is interesting, but it doesn't negate the obvious fact
that the root cause of infection is rarely a virus but circumstances;
internal(immune and metabole state) and external(weather and pollution)
and the presence of pathogens and the presence of messengers.