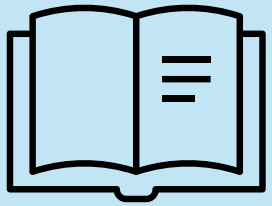
u3a learn, laugh, live

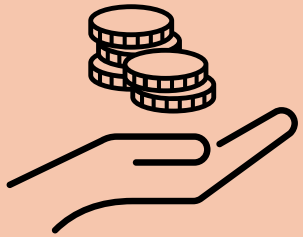
science

History

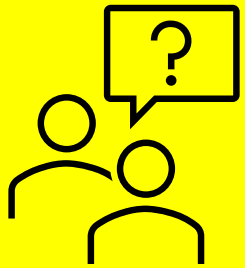


Science

Commerce

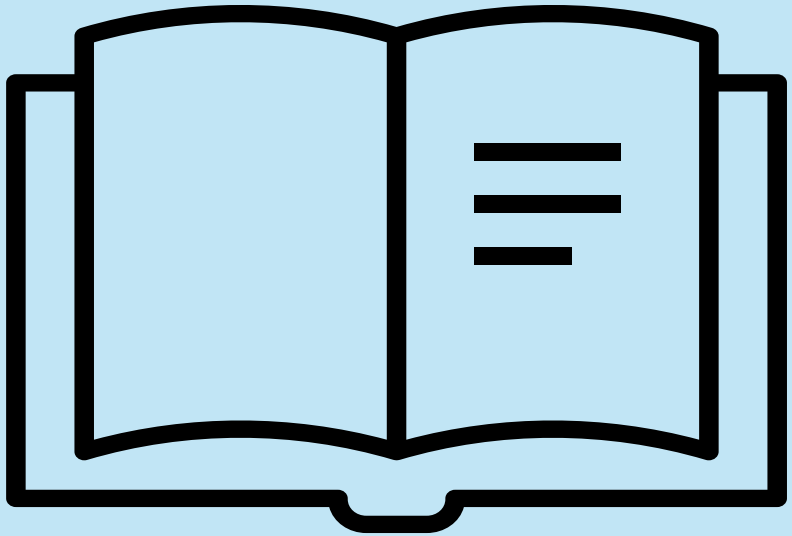


Morality

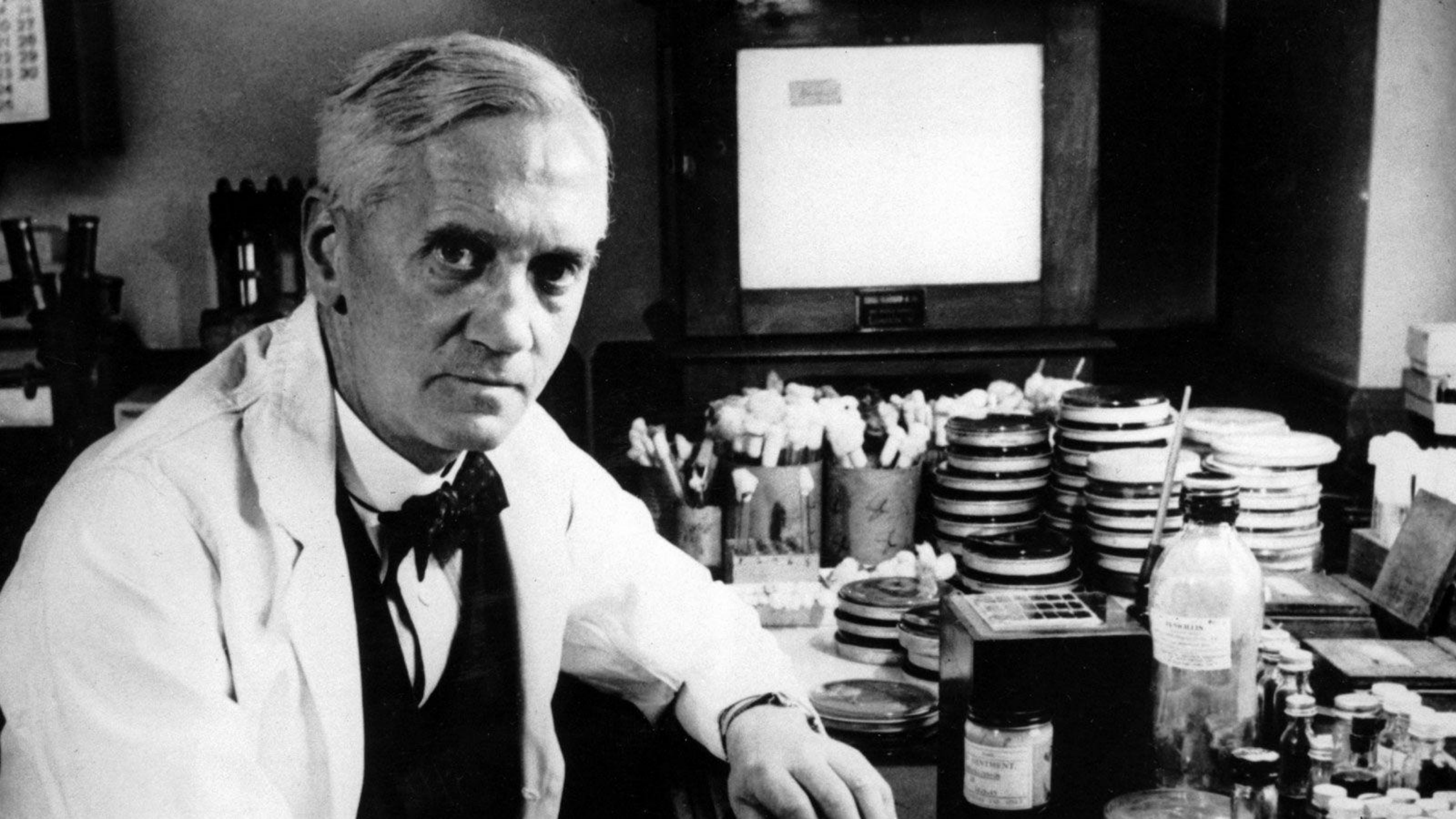


The story of Amoxicillin

History



Who discovered penicillin?



J.H.F. Link

Discovered *Penicillium* in 1809

Taxonomy of *Penicillium*

Domain: Eukaryota

Kingdom: Fungi

Phylum: Ascomycota

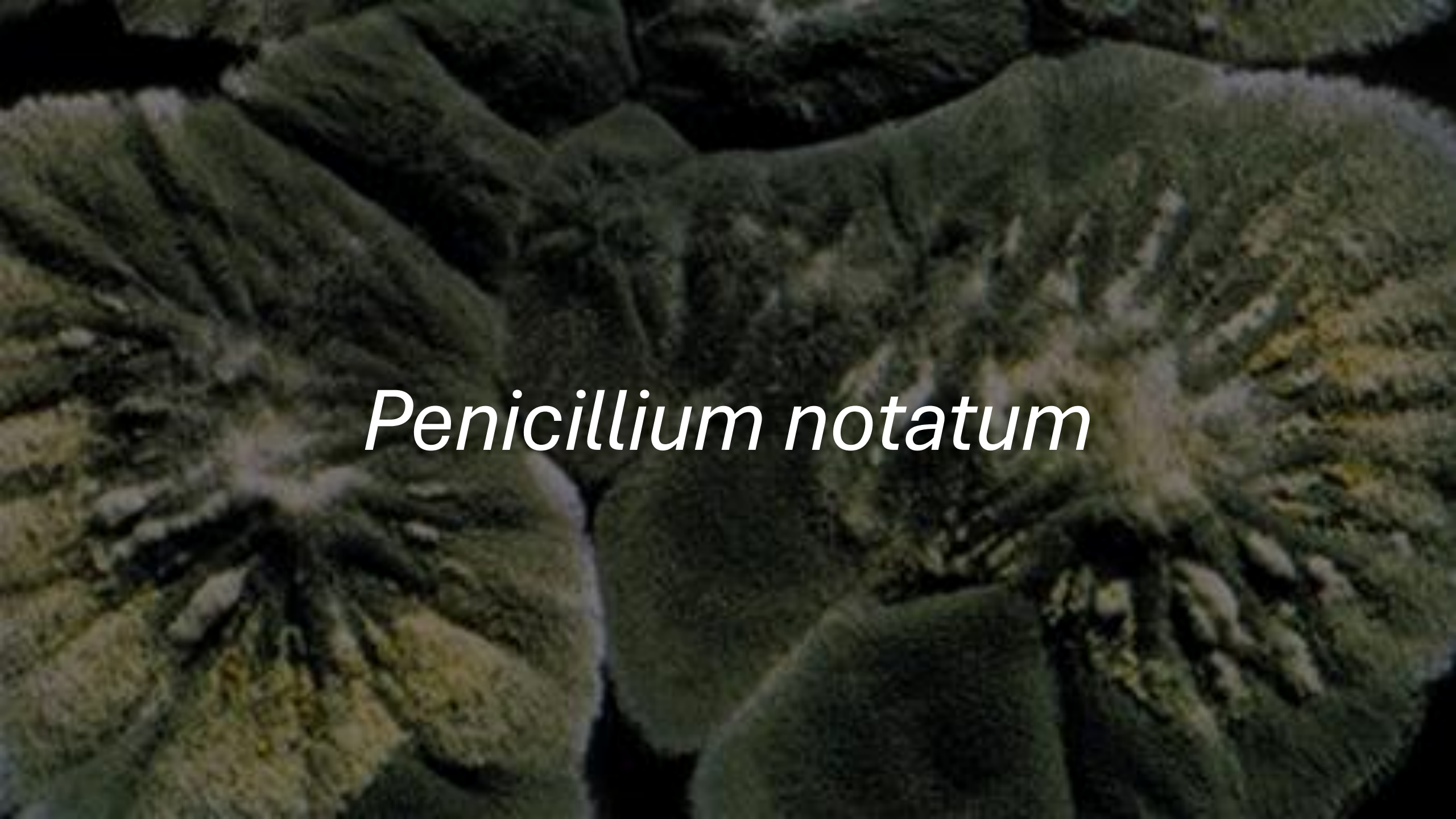
Class: Eurotiomycetes

Order: Eurotiales

Family: Aspergillaceae

Genus: *Penicillium*


Penicillium camemberti

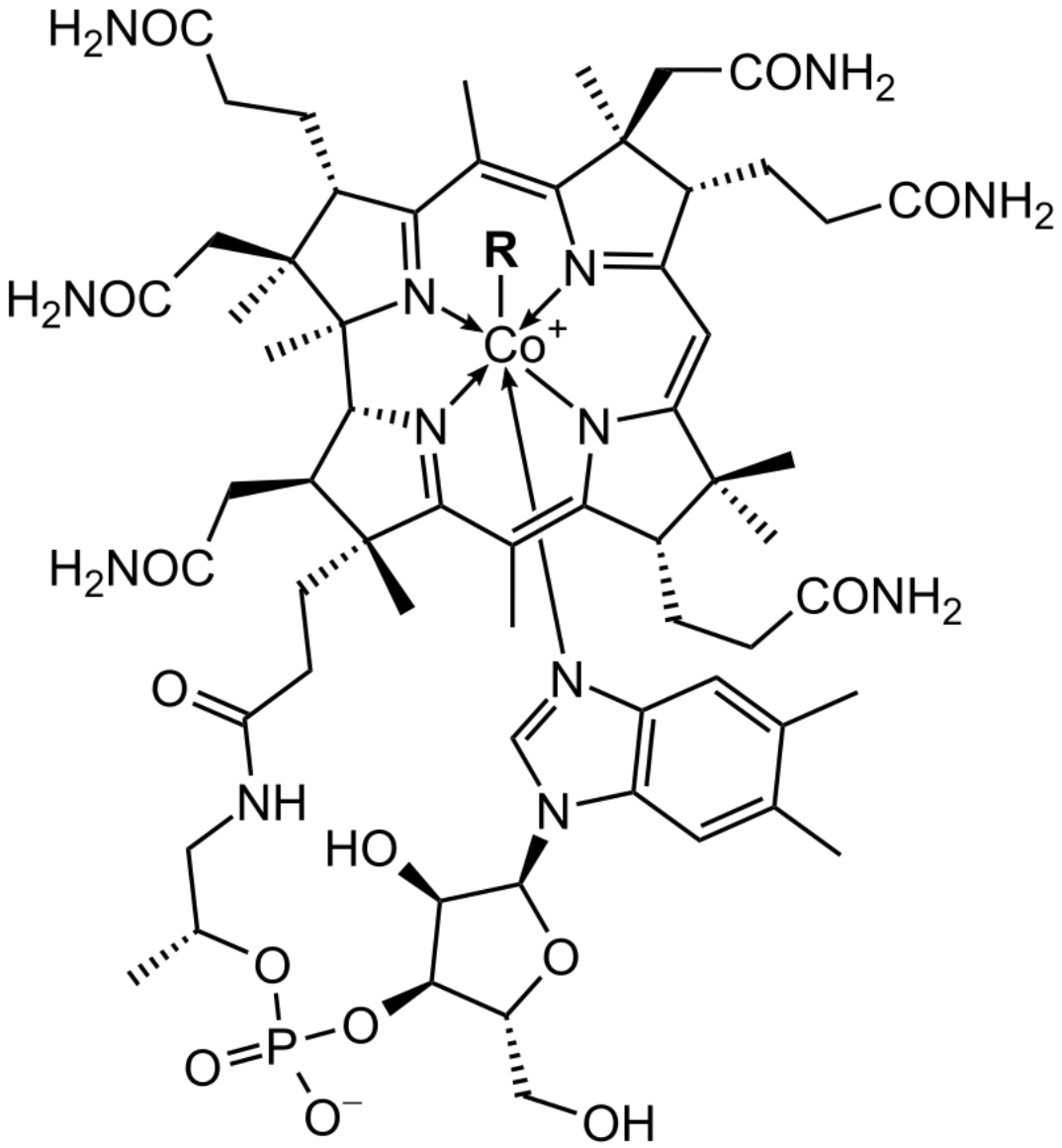

Penicillium notatum


Penicillium chrysogenum

Florey and Chain

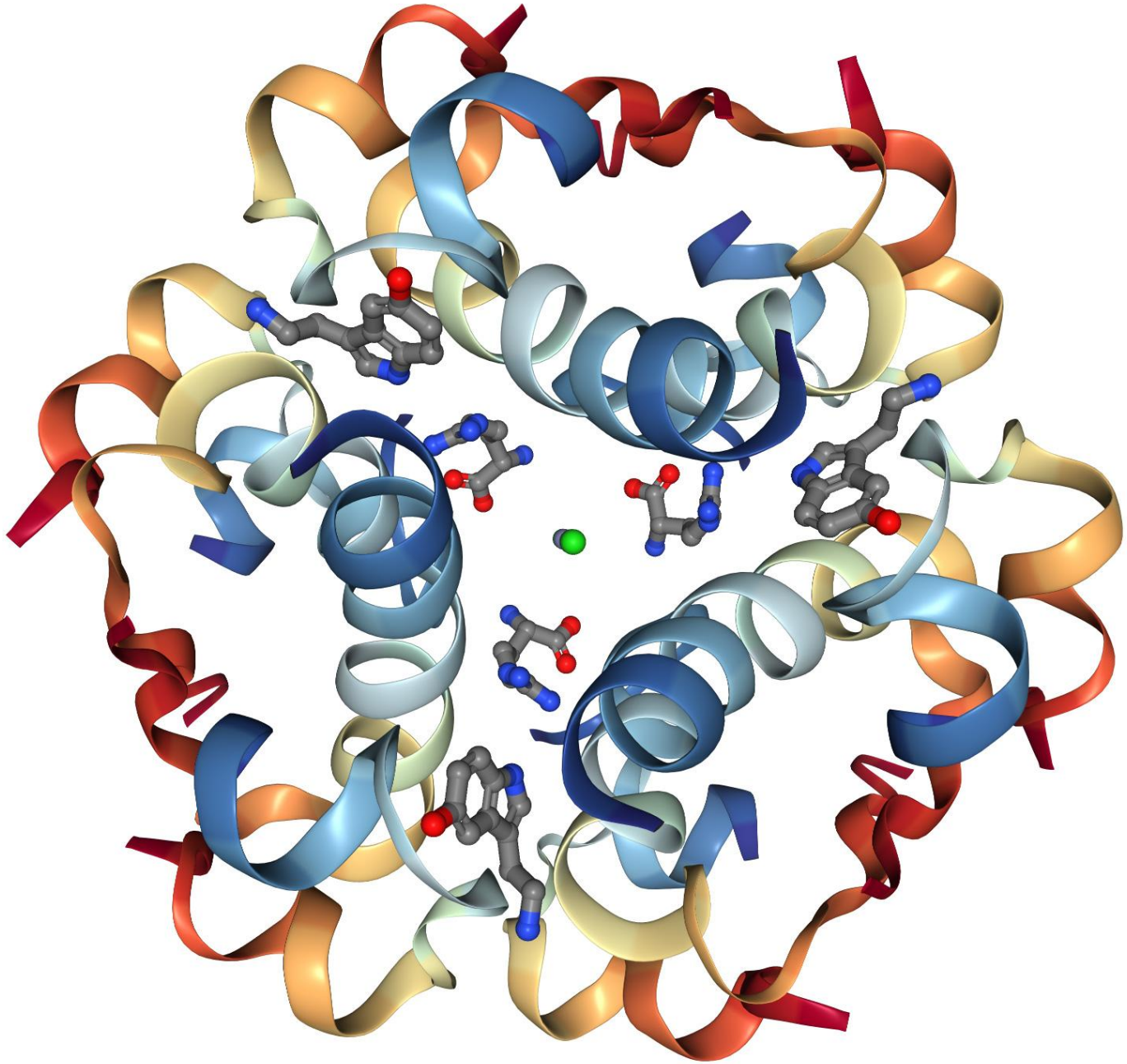

Dorothy Hodgkin

B12



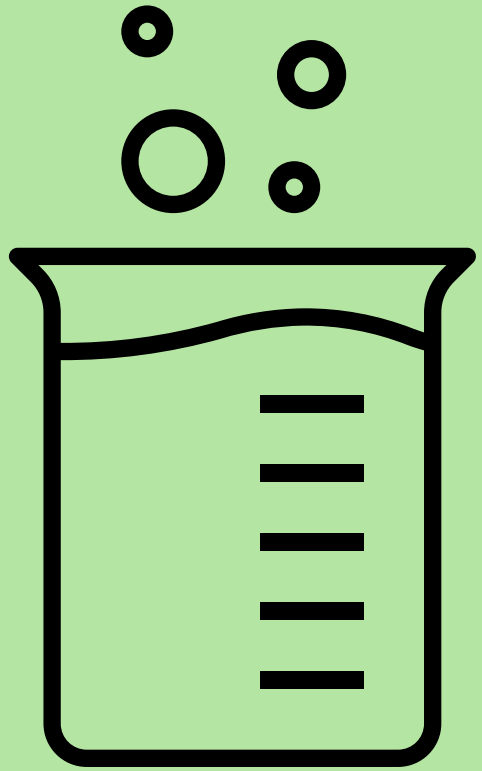
R = 5'-deoxyadenosyl, CH_3, OH, CN

Insulin

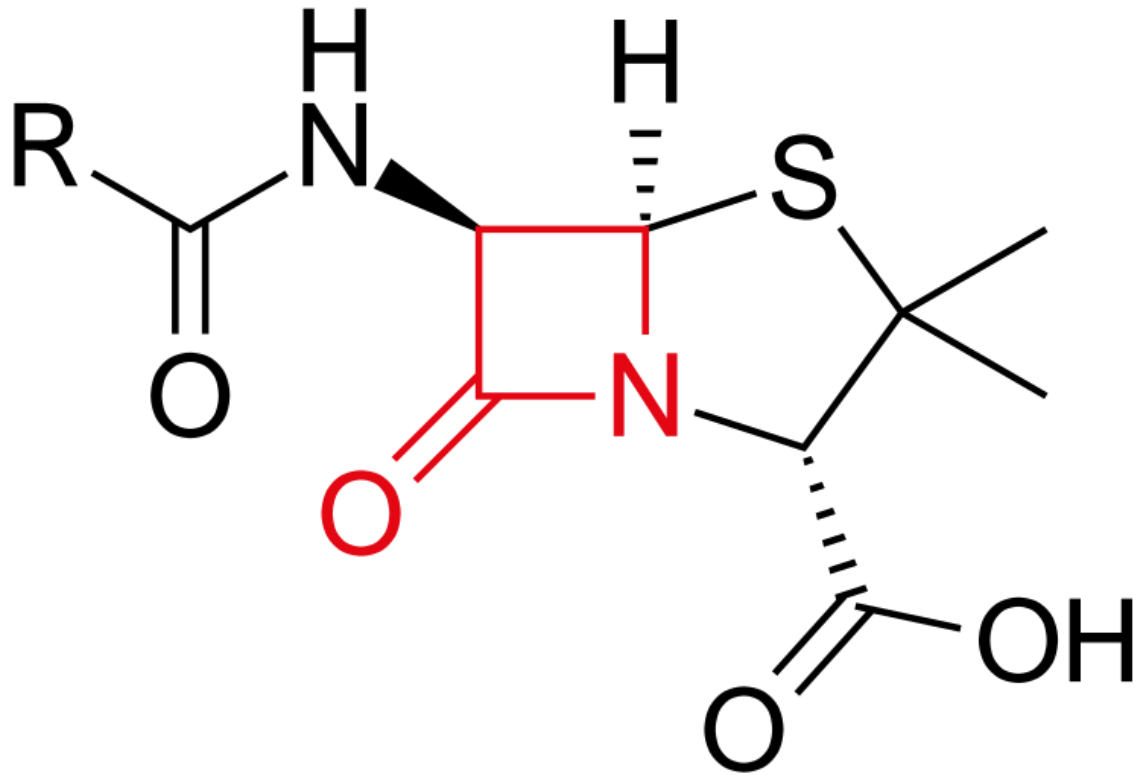


Thatcher and Hodgkin

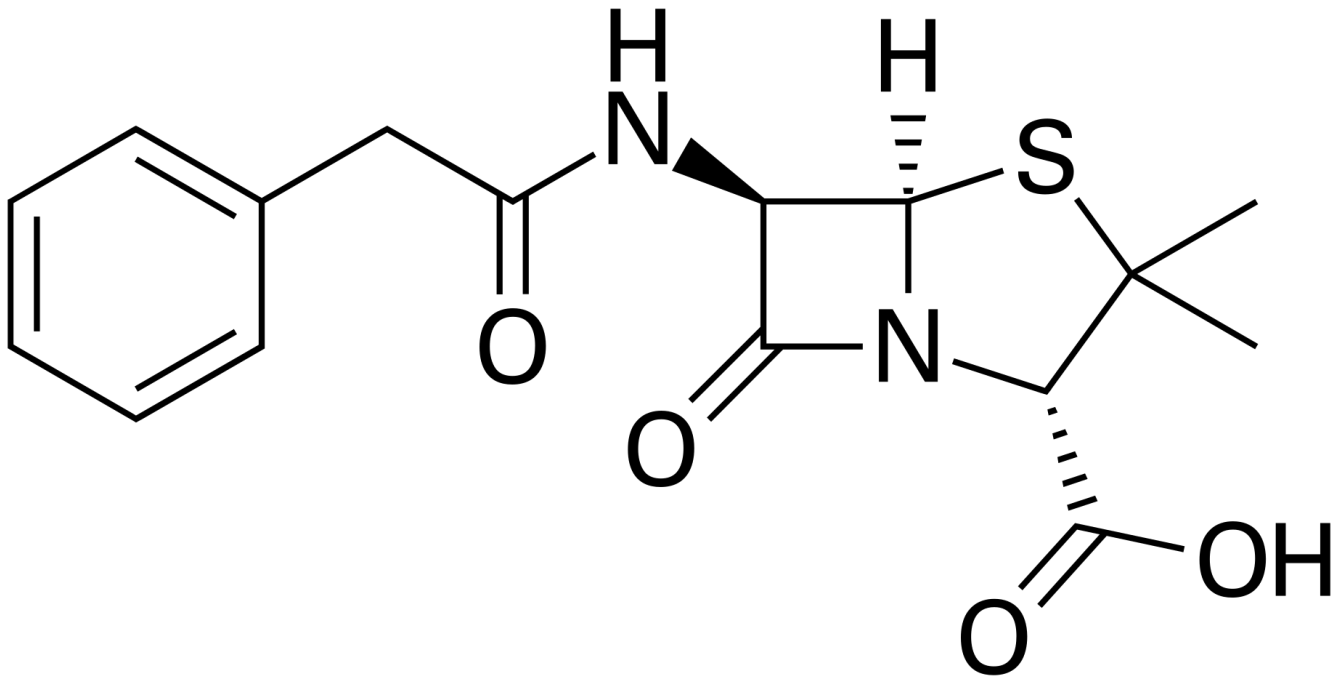
Science



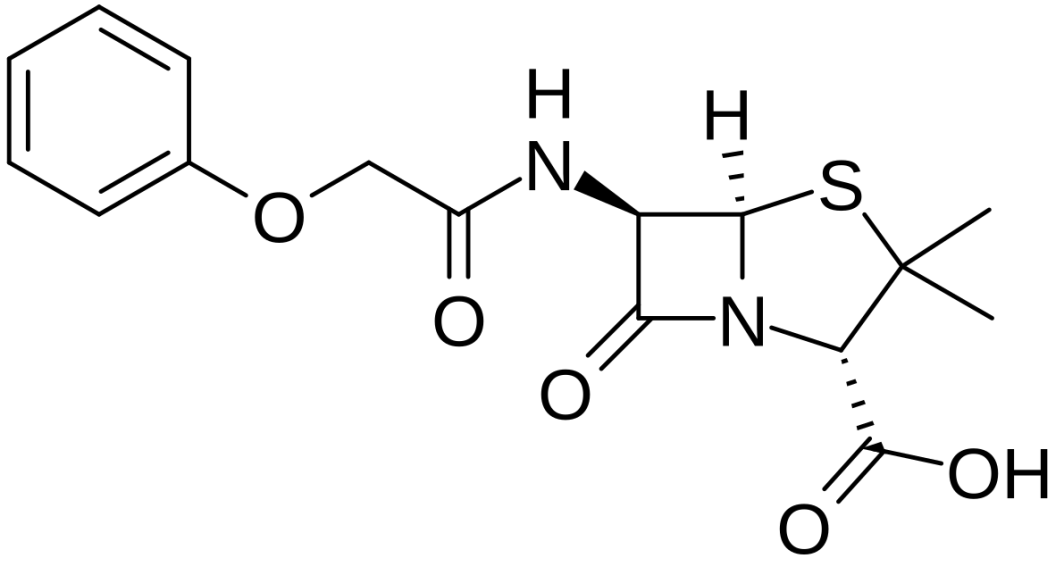
Beta-lactams



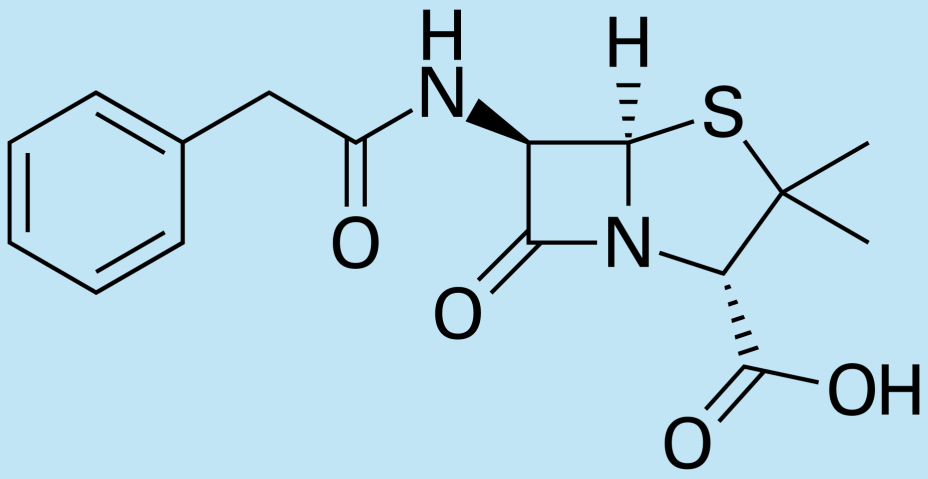
Benzylpenicillin (penicillin G)



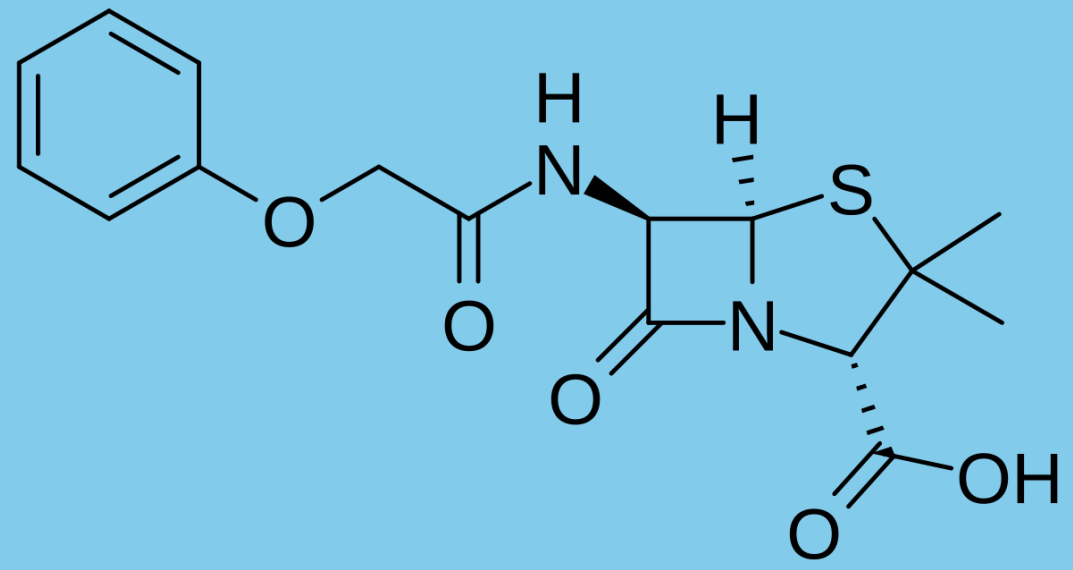
Phenoxymethylpenicillin (penicillin V)



Penicillin G

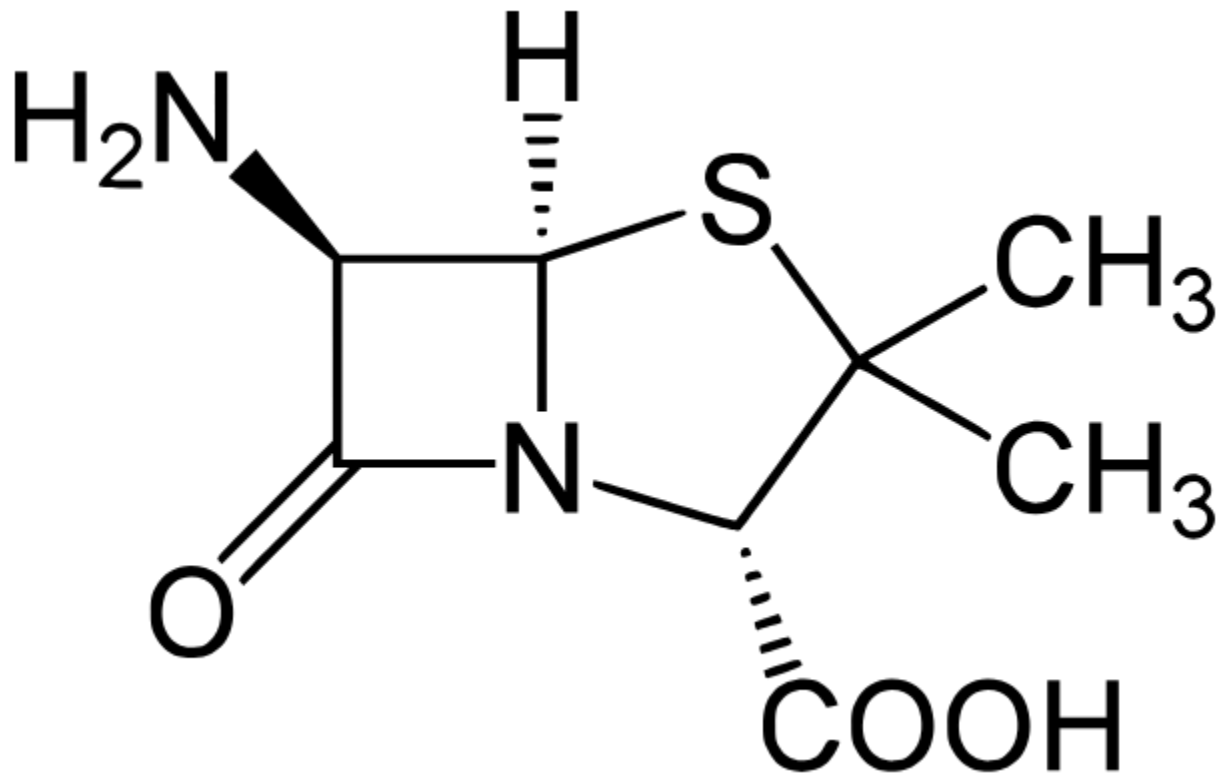


Penicillin V

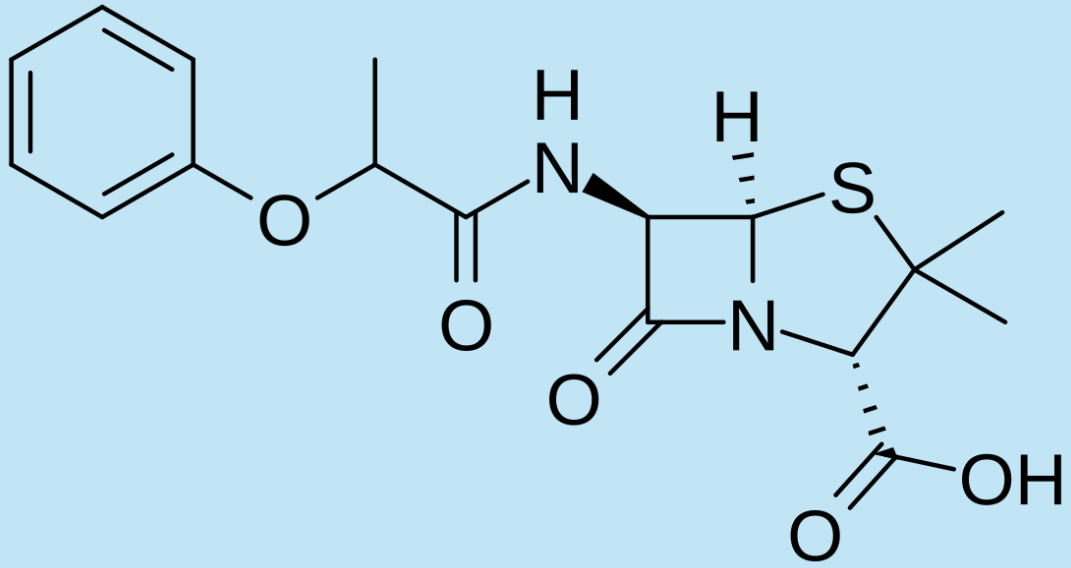


Hans Christian Joachim Gram

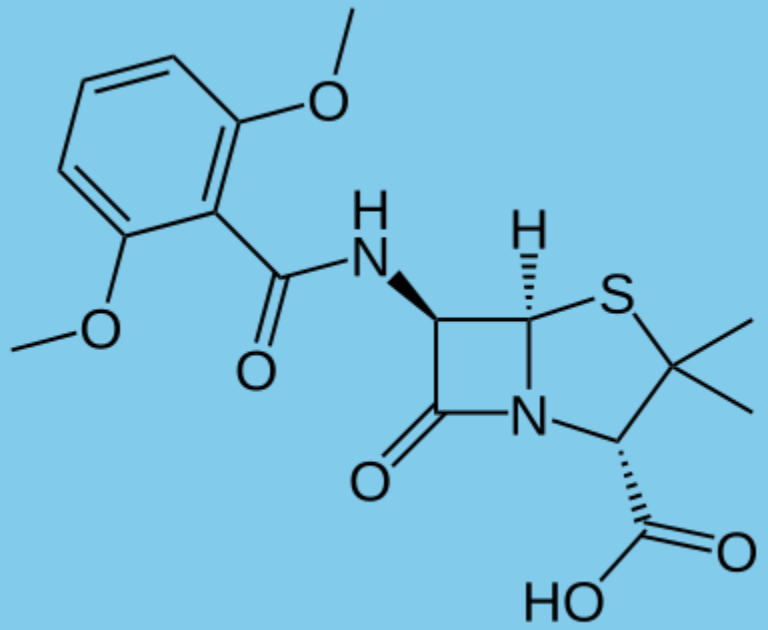
6-aminopenicillanic acid



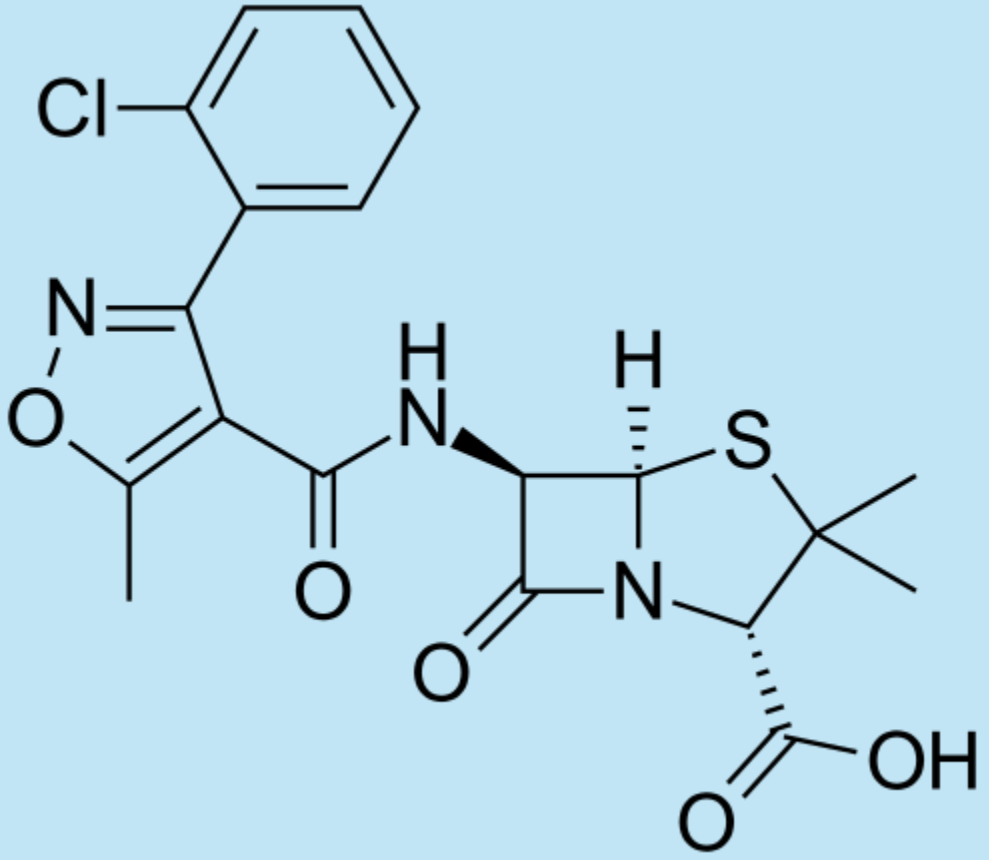
Phenethicillin



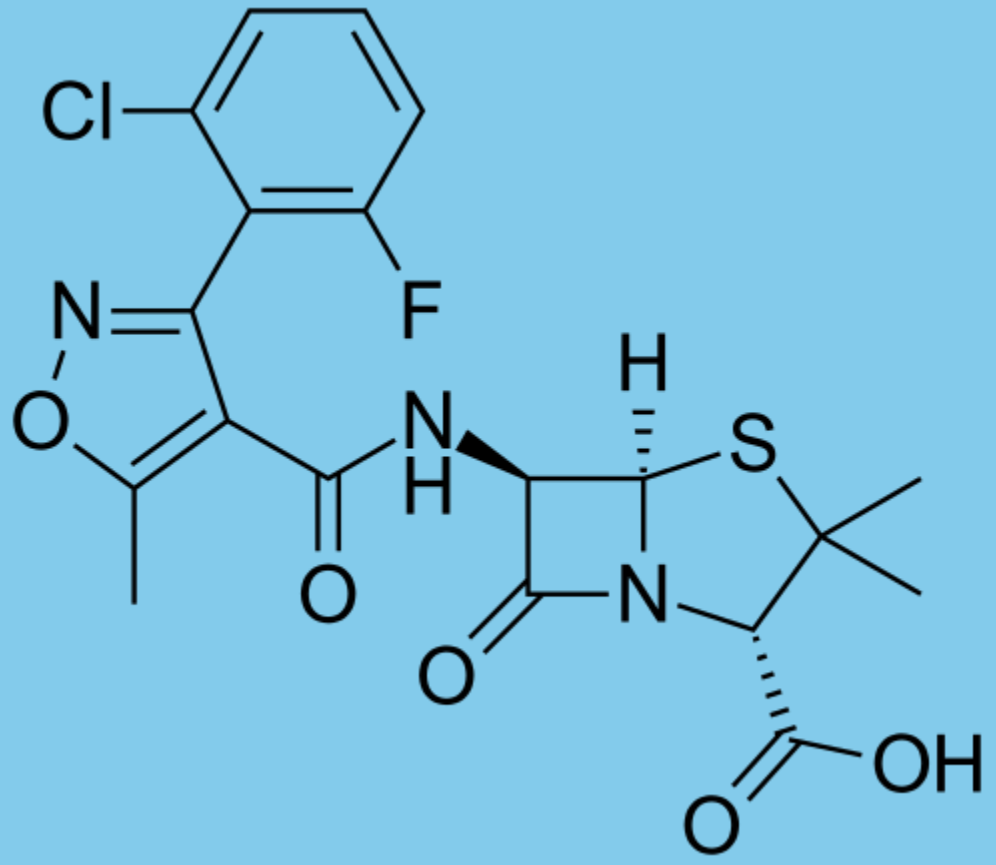
Methicillin



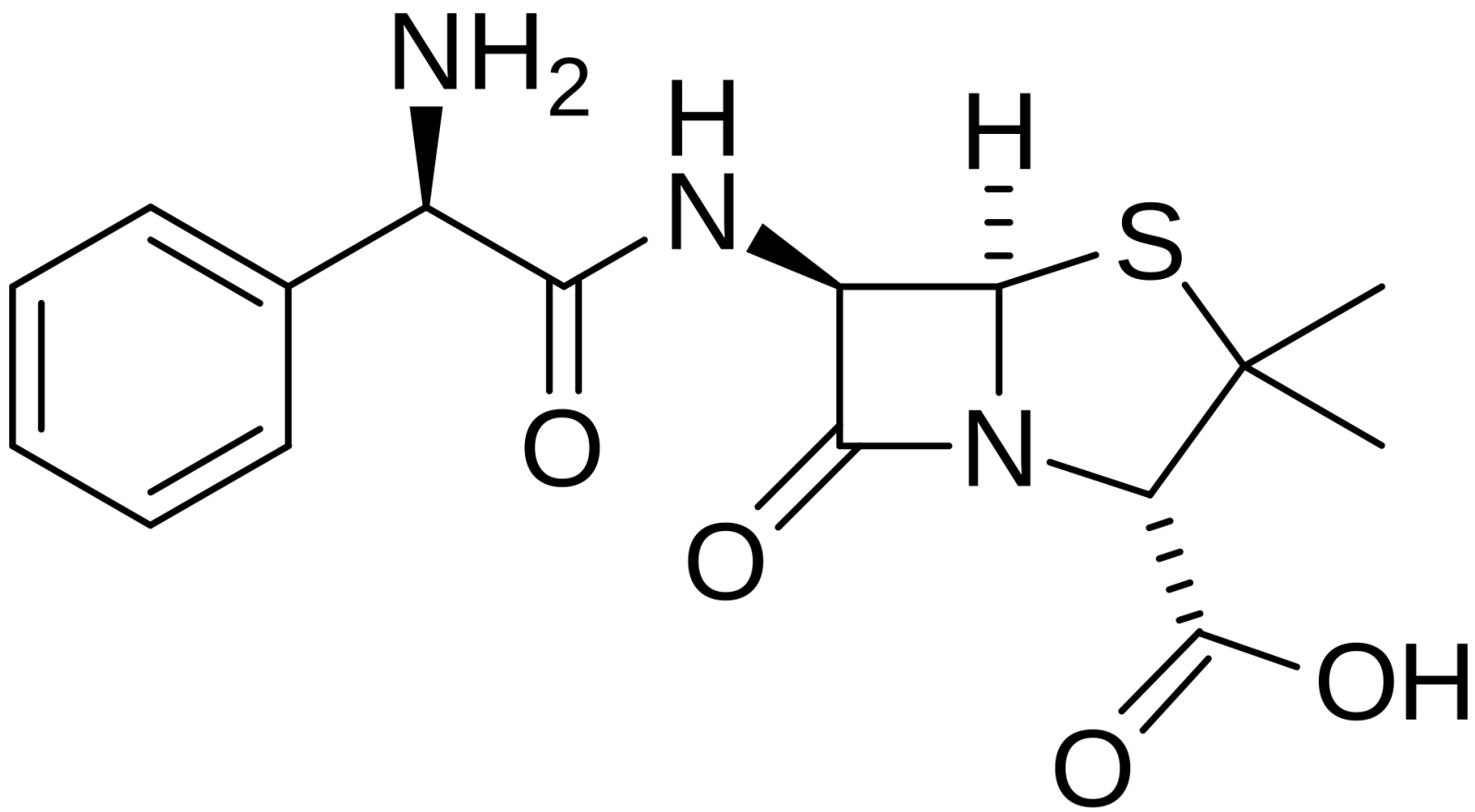
Cloxacillin



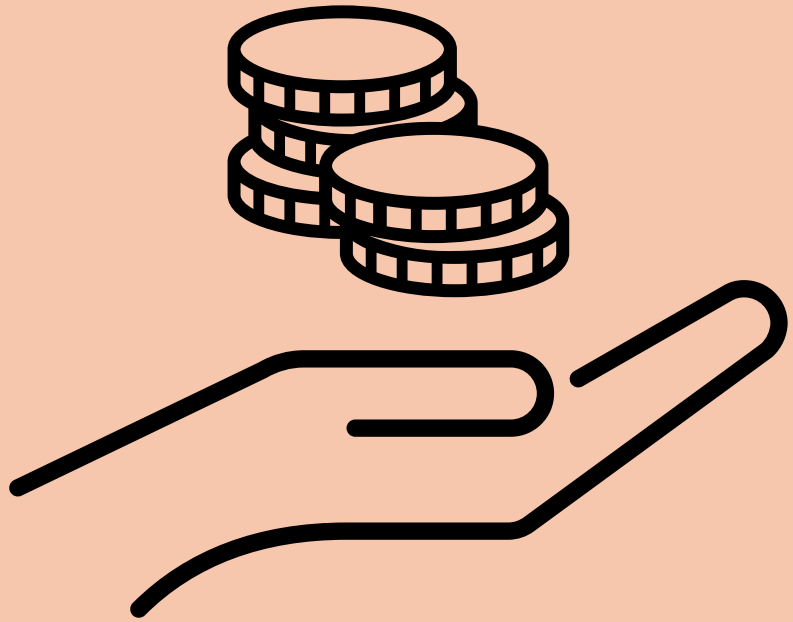
Flucloxacillin



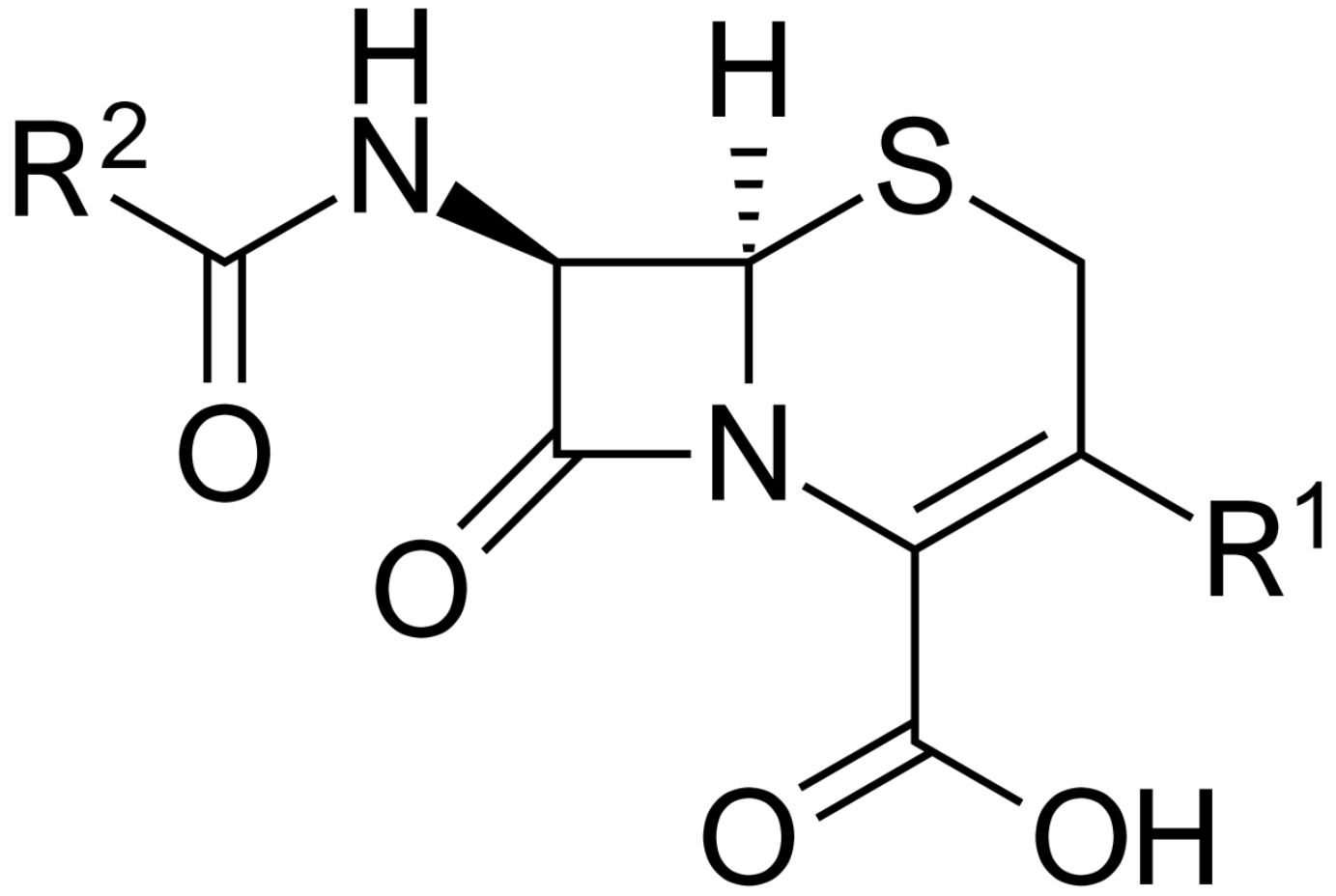
Ampicillin



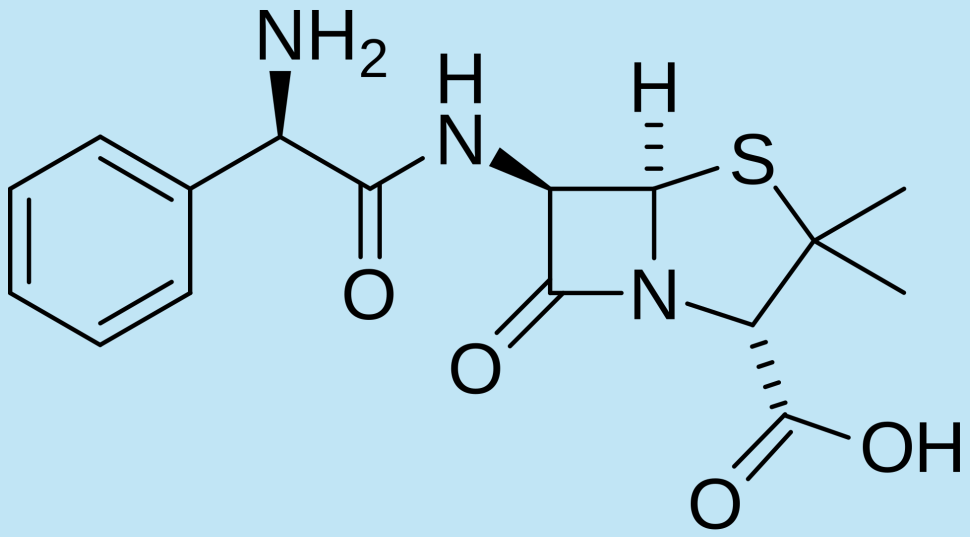
Commerce



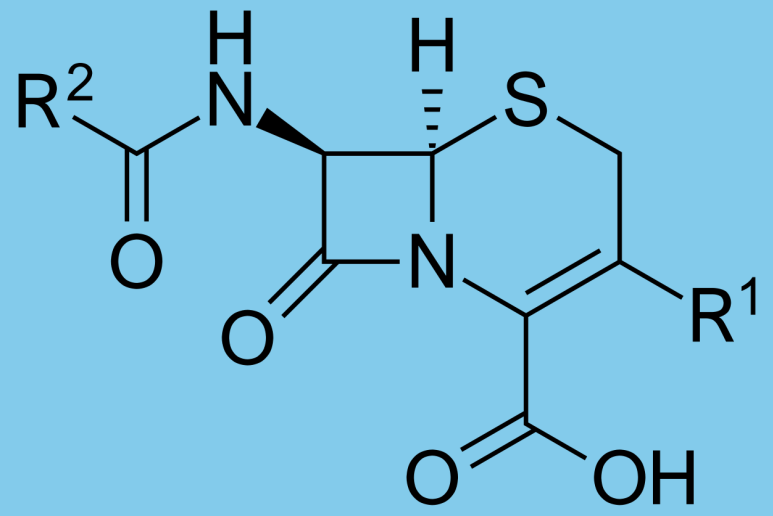
Cephalosporins



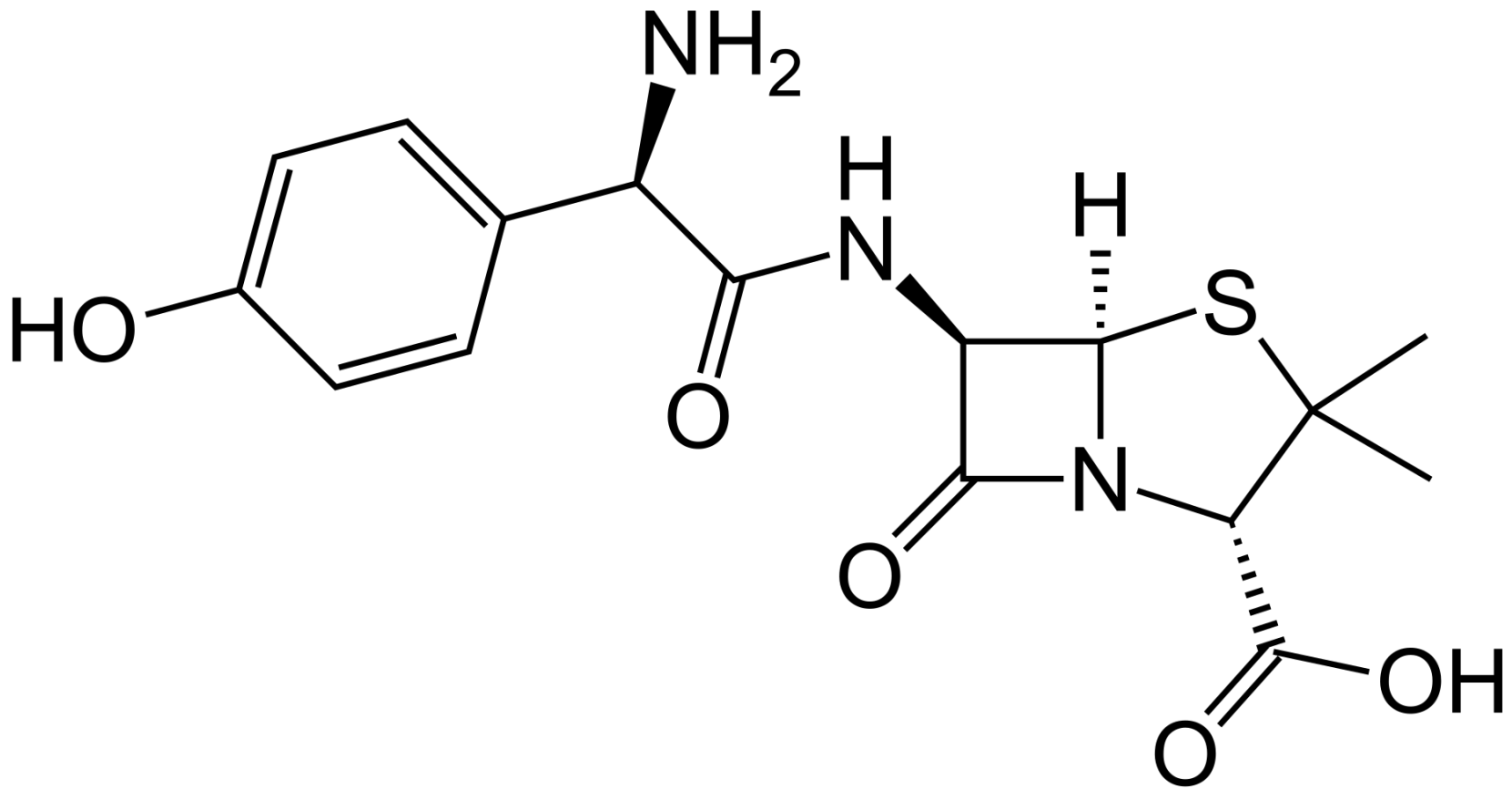
Ampicillin



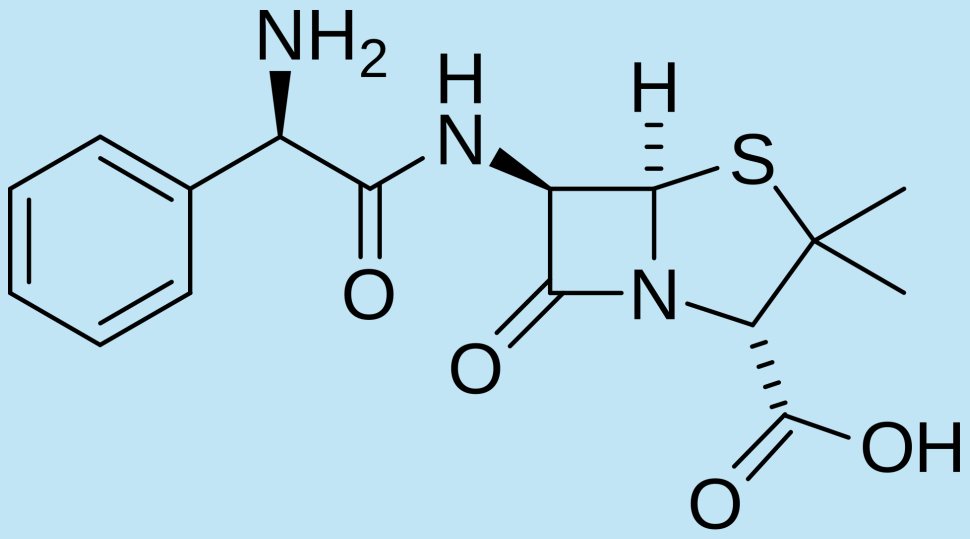
Cephalosporins



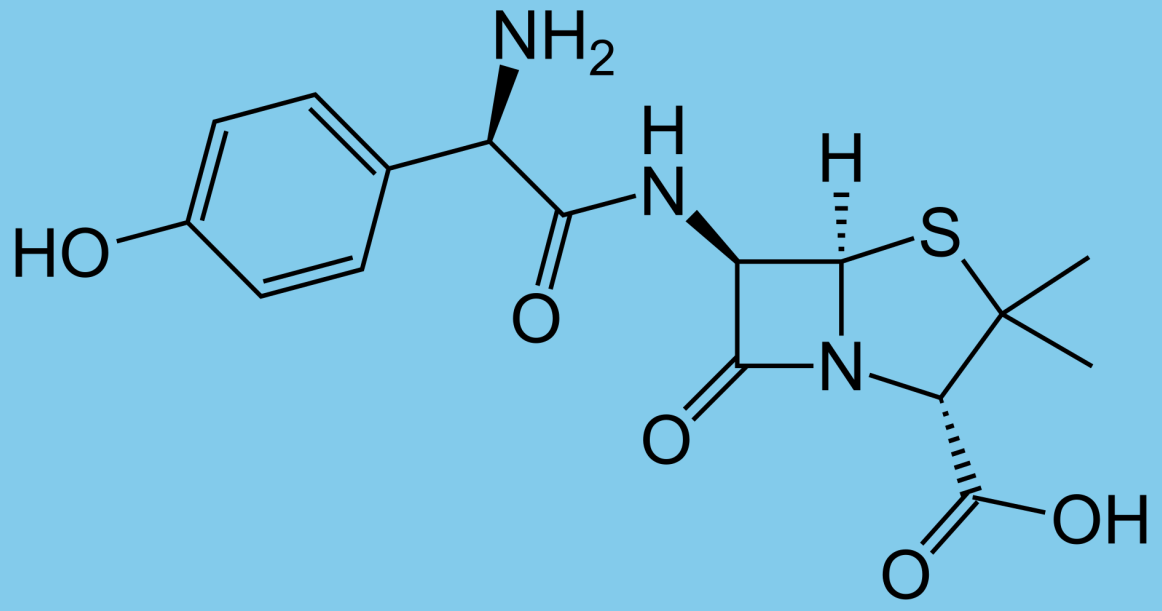
Amoxicillin



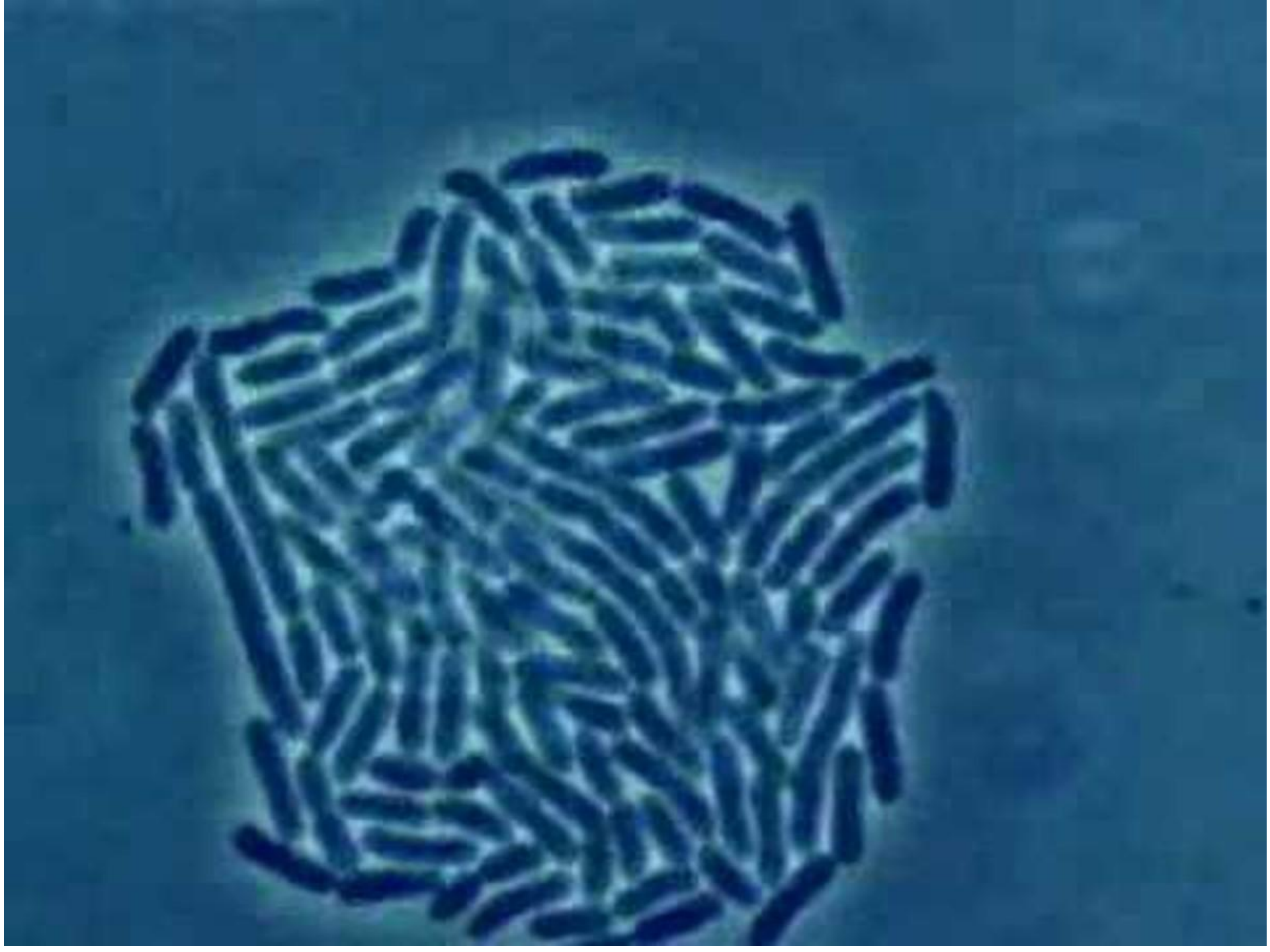
Ampicillin



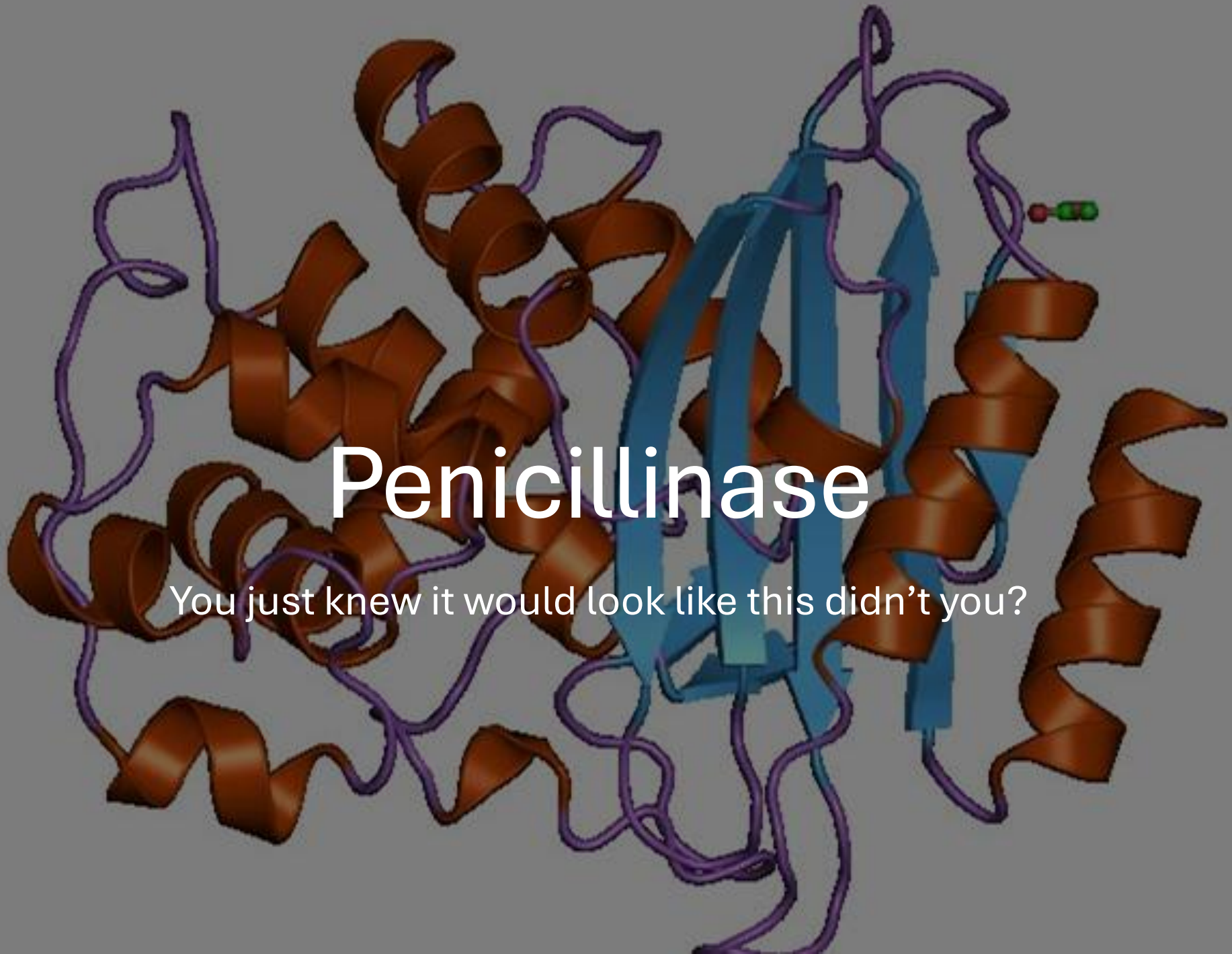
Amoxicillin




evian
NATURAL MINERAL WATER
75cL



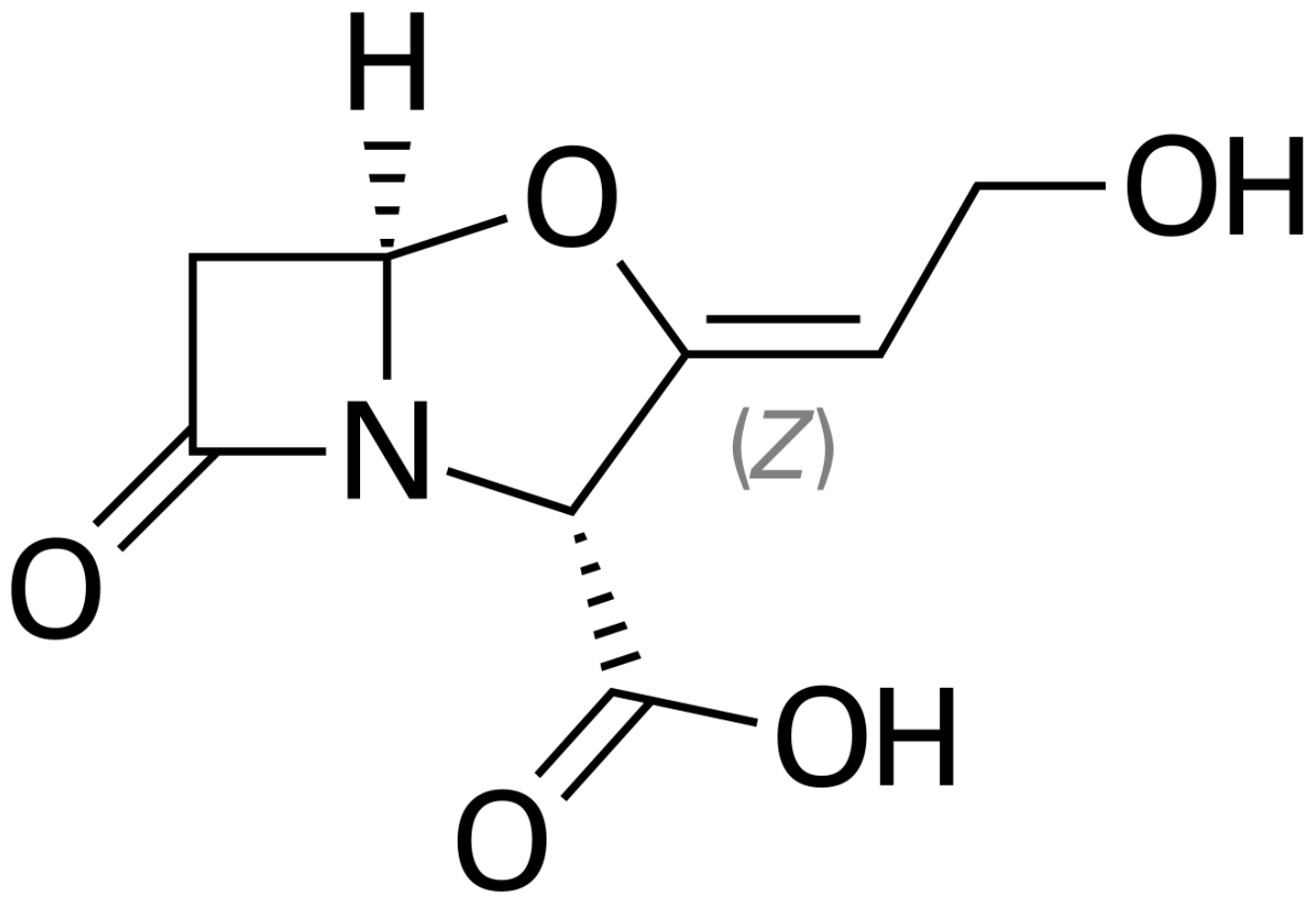
Amoxil (Bencard)



Penicillinase

You just knew it would look like this didn’t you?

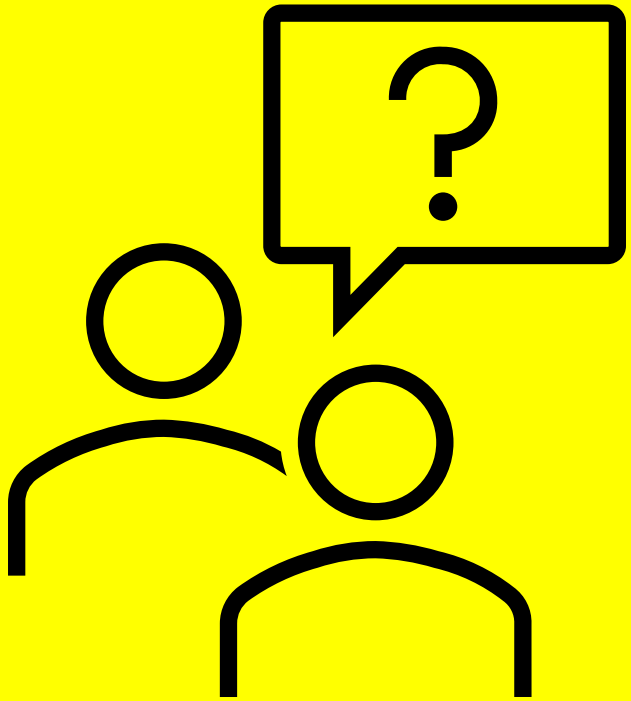
Clavulanic Acid



Clavulanic acid plus amoxicillin

(Augmentin, Co-amoxiclav)

Morality



The chemical name of amoxicillin

(2S,5R,6R)-6-[[(2R)-2-amino-2-(4-hydroxyphenyl)acetyl]amino]-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid

(2S,5R,6R)-6-[[(2R)-2-amino-2-(4-hydroxyphenyl)acetyl]amino]-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid

Amoxicillin

Amoxil


Yes!
No!

Nobel prize for physiology (1945)

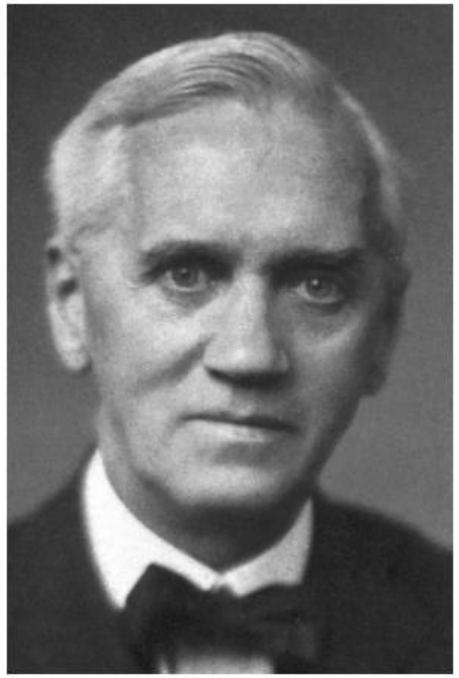


Photo from the Nobel Foundation archive.

Sir Alexander Fleming

Prize share: 1/3

Photo from the Nobel Foundation archive.

Ernst Boris Chain

Prize share: 1/3

Photo from the Nobel Foundation archive.

Sir Howard Walter Florey

Prize share: 1/3

Summary of the story of Amoxicillin

- *Penicillium*
- Penicillin
- 6APA
- Amoxicillin

The end

Any questions?

The future

PDDPs: Proteasome-derived defence peptides

“an untapped source of natural antibiotics”

- Research published in **March 2025** has discovered a new part of the immune system - PDDPs
- The proteasome (which recycles proteins) can detect infection and responds by creating PDDPs, which have antimicrobial activity
- PDDPs are now being investigated as a potential **new source of antibiotics**

Joshua Lederberg

Nearly 15 years ago, Nobel laureate Joshua Lederberg wrote, **“The future of humanity and microbes will likely evolve as … episodes of our wits vs their genes”**. With respect to our wits, despite past failings, there is reason for future optimism. The current high frequency of inappropriate antibiotic use could lessen dramatically over the coming decade thanks to major and rapidly evolving scientific advances among diagnostic and biomarker technology, and new policies and research reflecting a better understanding of the psychology driving inappropriate use. Future therapy could consist of some combination of specific antibody, organism-specific bacteriophage, small molecules (or antisense small interfering micro-RNAs) that inhibit specific virulence factors, and drugs that counter antibiotic resistance mechanisms (eg, new β-lactamase inhibitors, and blockade of efflux pumps).

Spellberg and Gilbert, 2014