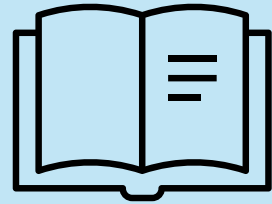


u3a learn,
laugh,
live

science

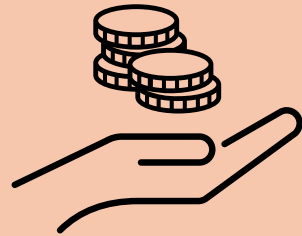
History



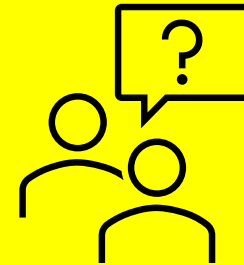
Science



Commerce

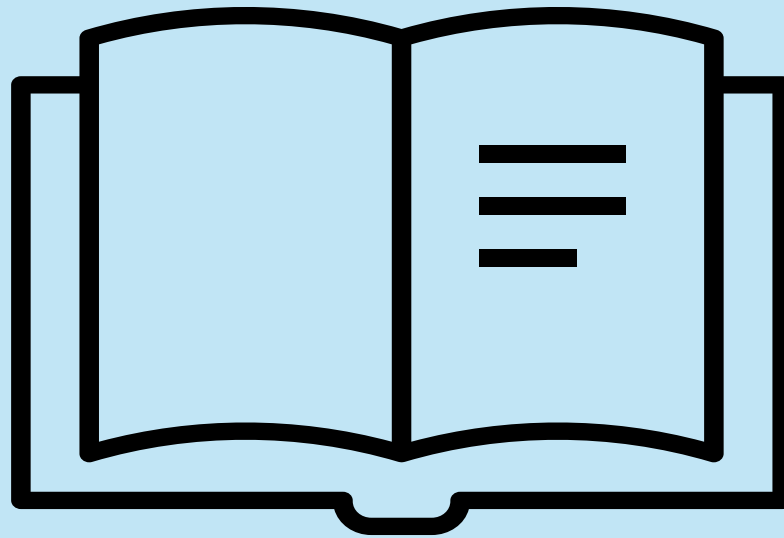


Morality

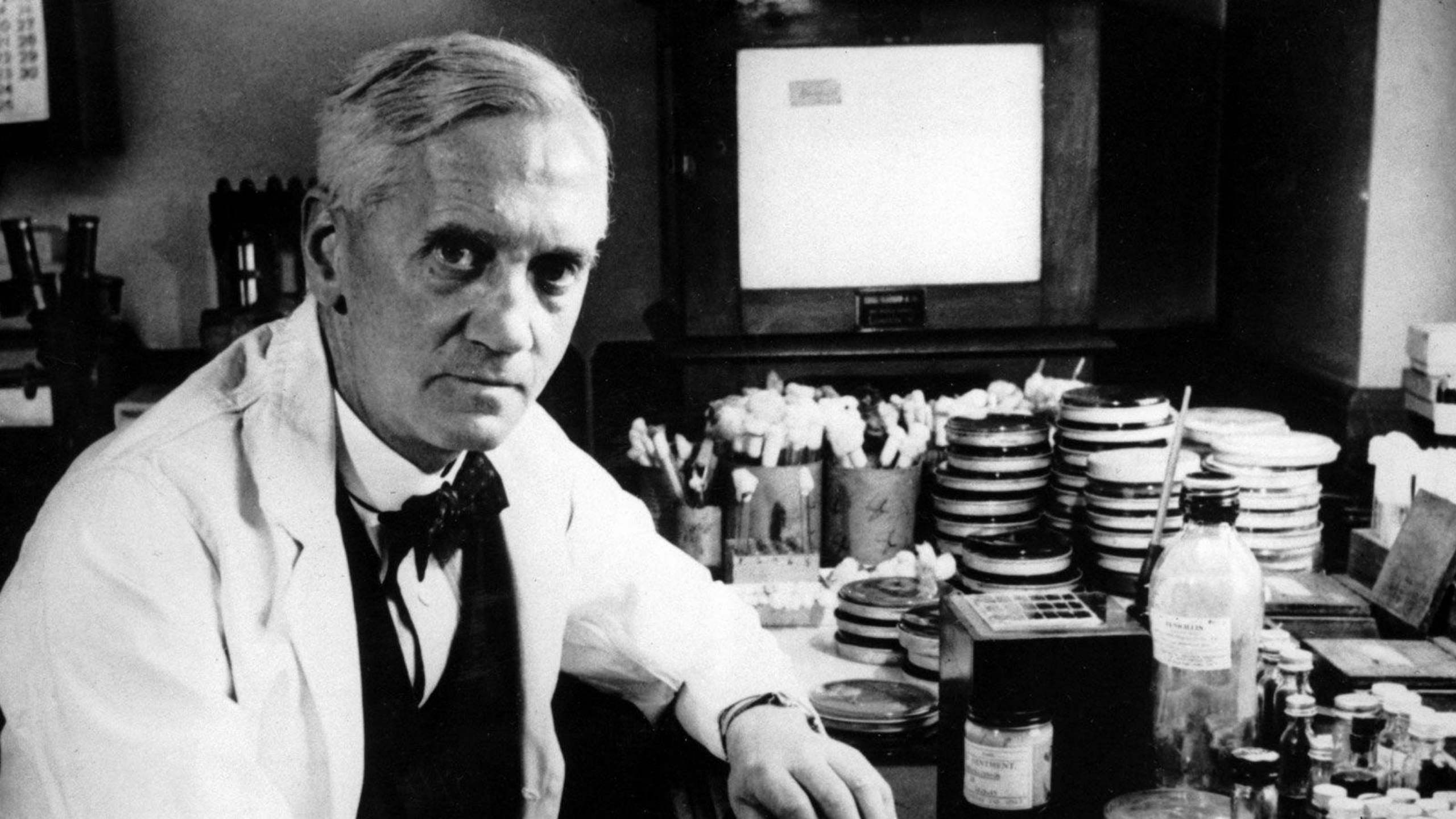


The story of Amoxicillin

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

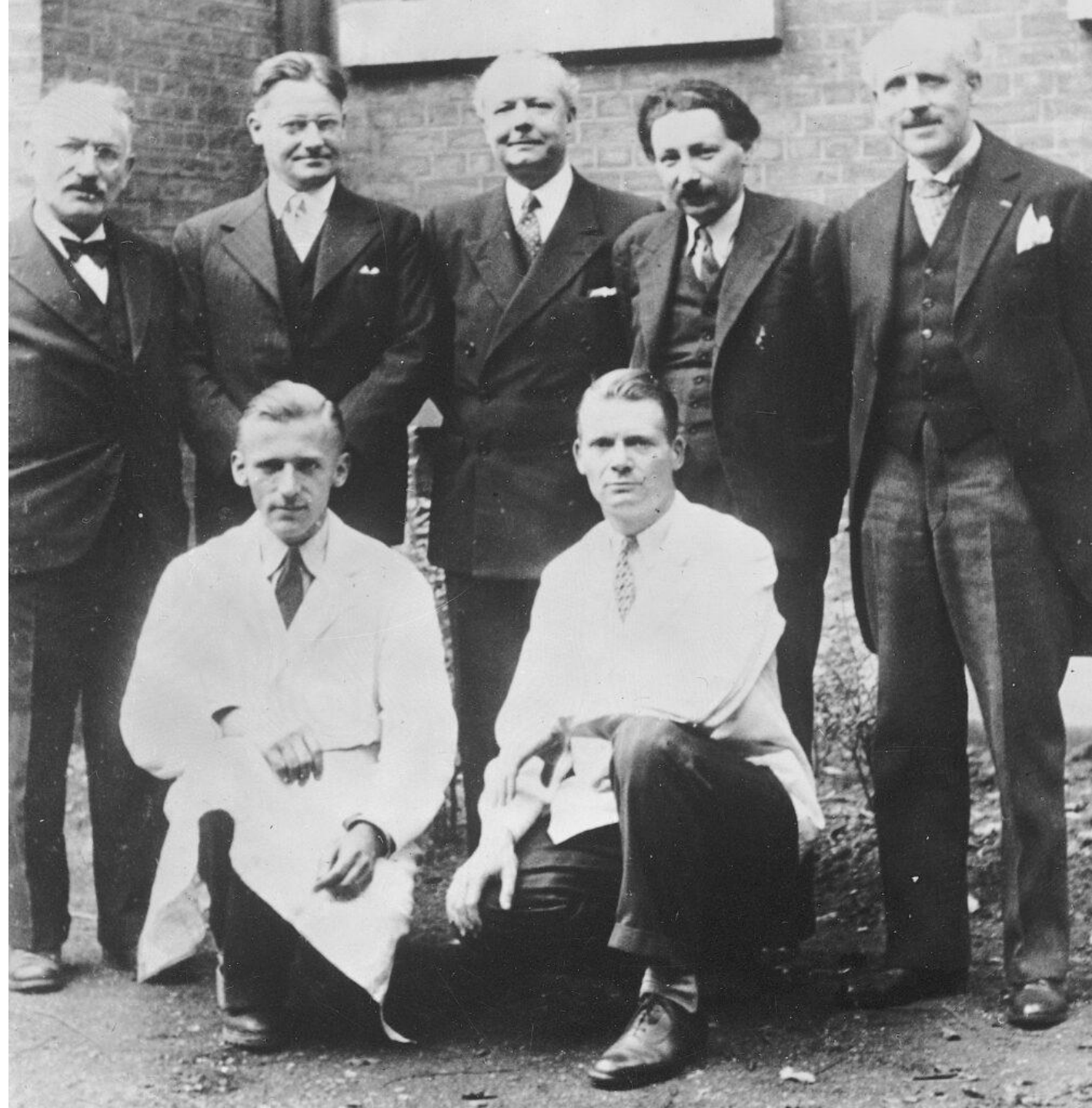
A close-up, macro photograph of a slice of bread heavily colonized by Penicillium notatum mold. The mold appears as a dense, fuzzy layer of green and blue-green filaments covering the entire surface of the bread. The texture is highly irregular and porous. The lighting is somewhat dim, highlighting the intricate, branching structure of the fungal hyphae.

Penicillium notatum

A scanning electron micrograph (SEM) of the mold *Penicillium chrysogenum*. The image shows a dense network of filamentous hyphae. From these hyphae, numerous chains of small, spherical spores (conidia) are visible, extending outwards. The spores are uniform in size and shape, appearing as a series of overlapping spheres. The overall structure is characteristic of the brush-like conidiophores of this species. The background is dark, making the light-colored biological structures stand out.

Penicillium chrysogenum

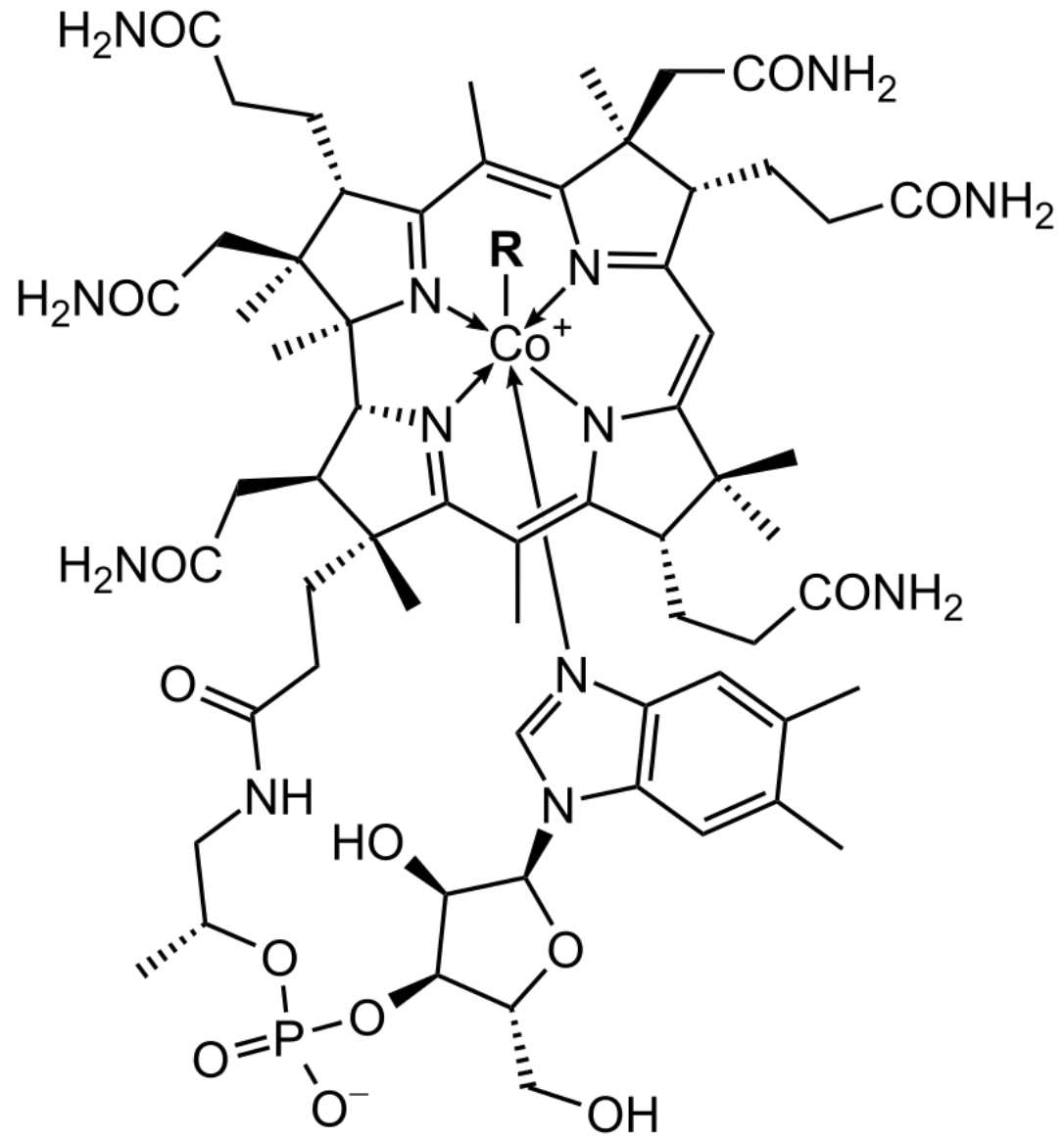
Florey and Chain



A black and white close-up portrait of Dorothy Hodgkin. She has dark, curly hair and is looking directly at the camera with a slight smile. The lighting is soft, highlighting her facial features.

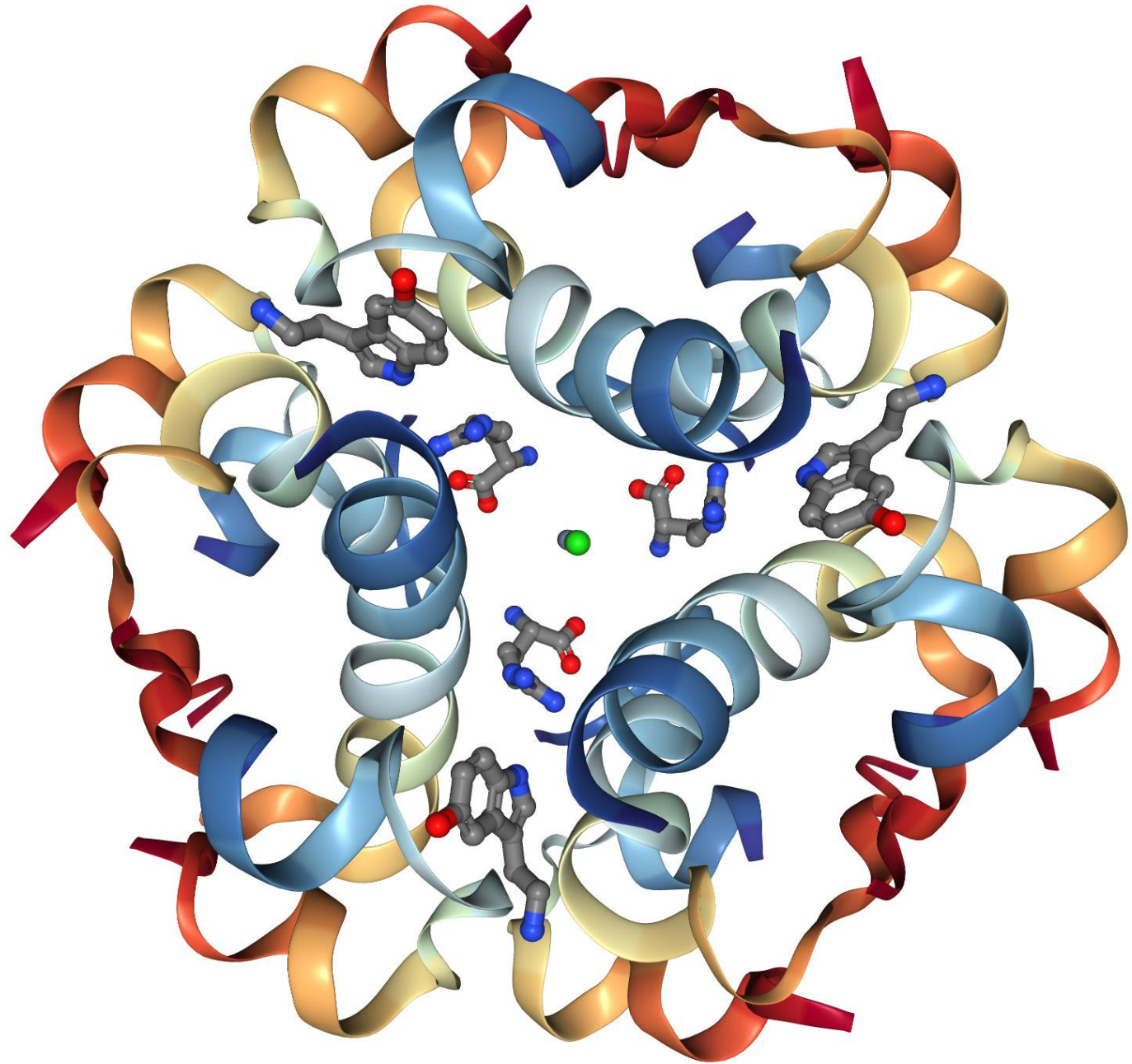
Dorothy Hodgkin

B12



$\text{R} = 5\text{'-deoxyadenosyl, CH}_3, \text{OH, CN}$

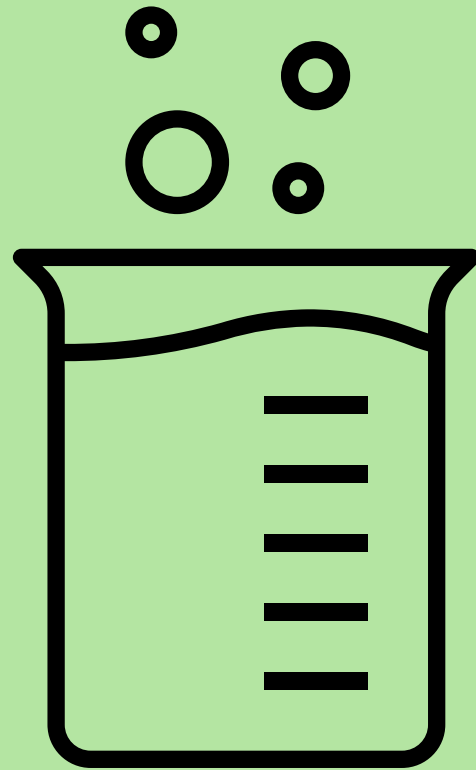
Insulin



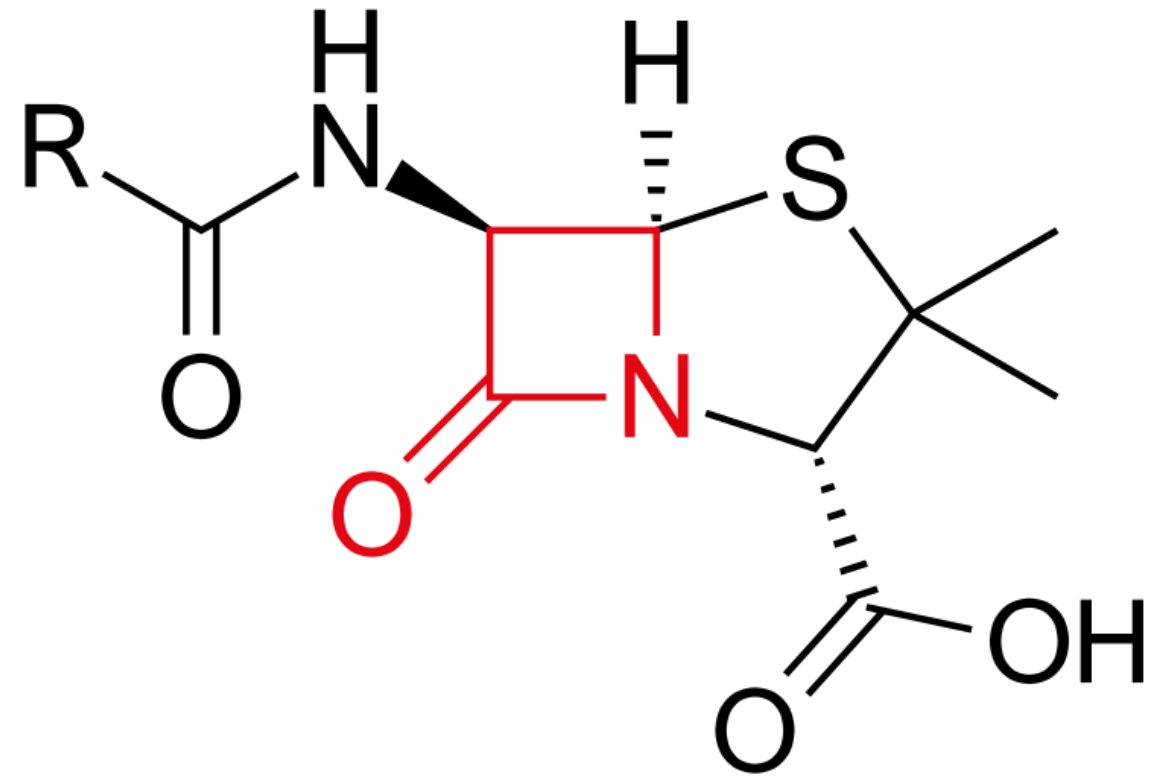
Thatcher and Hodgkin



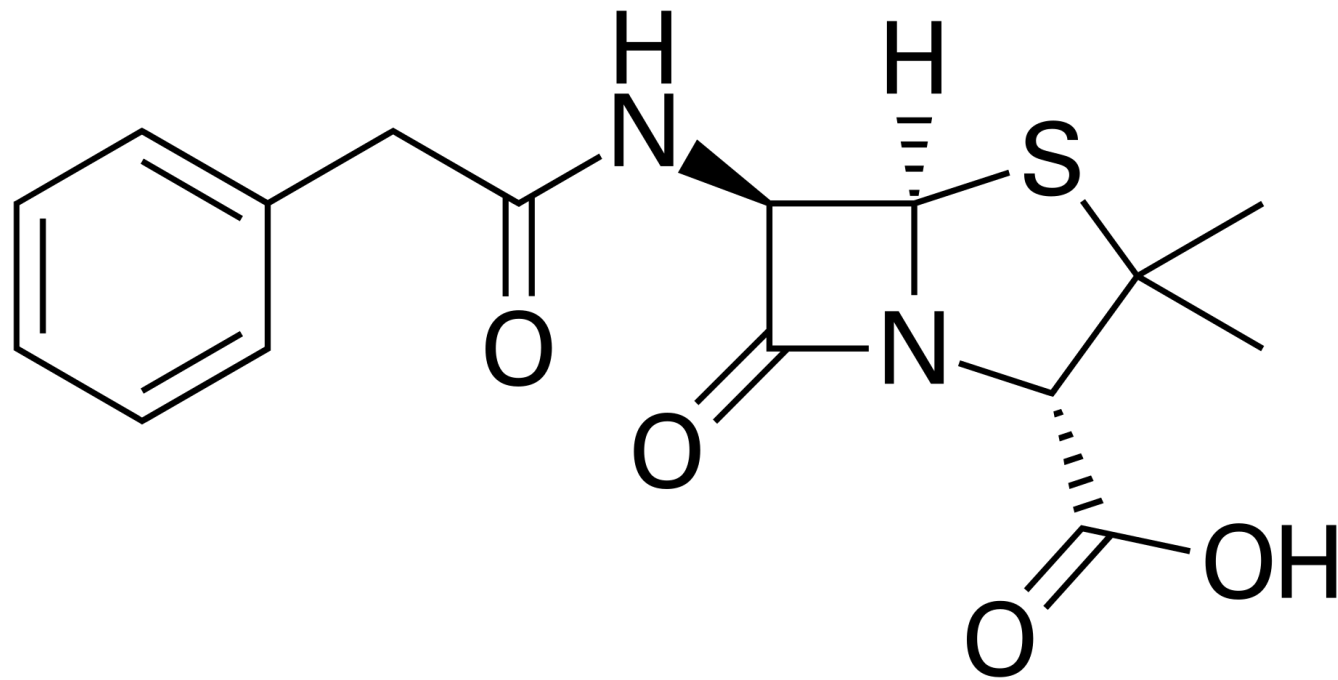
Science



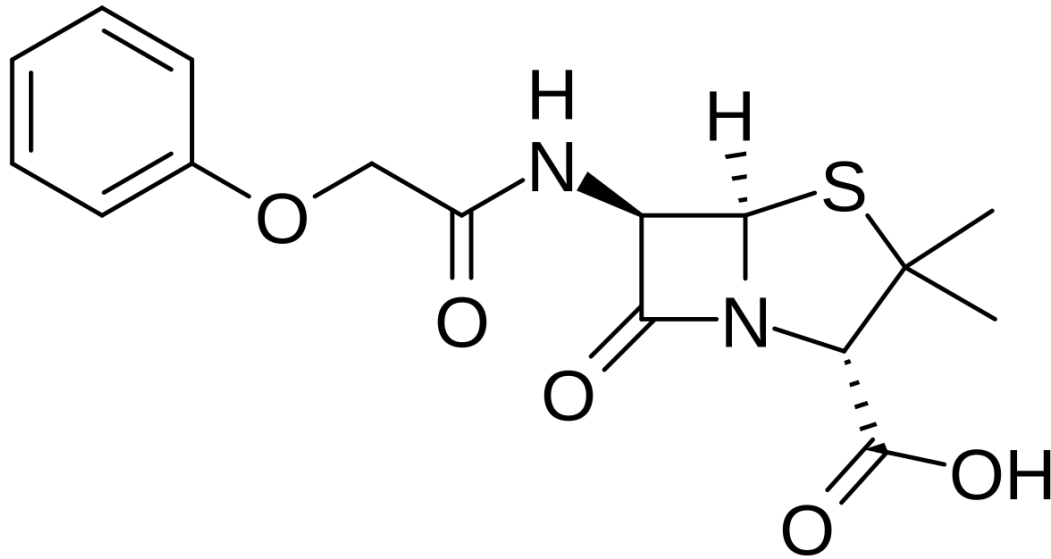
Beta-lactams



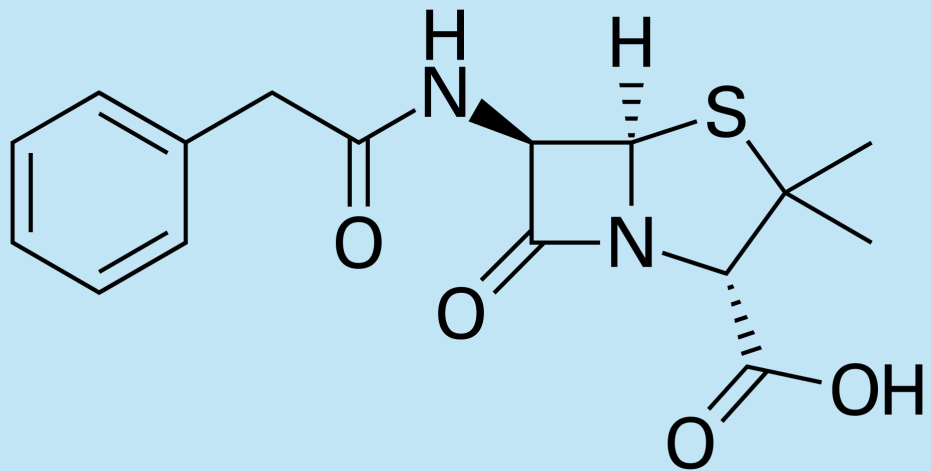
Benzylopenicillin (penicillin G)



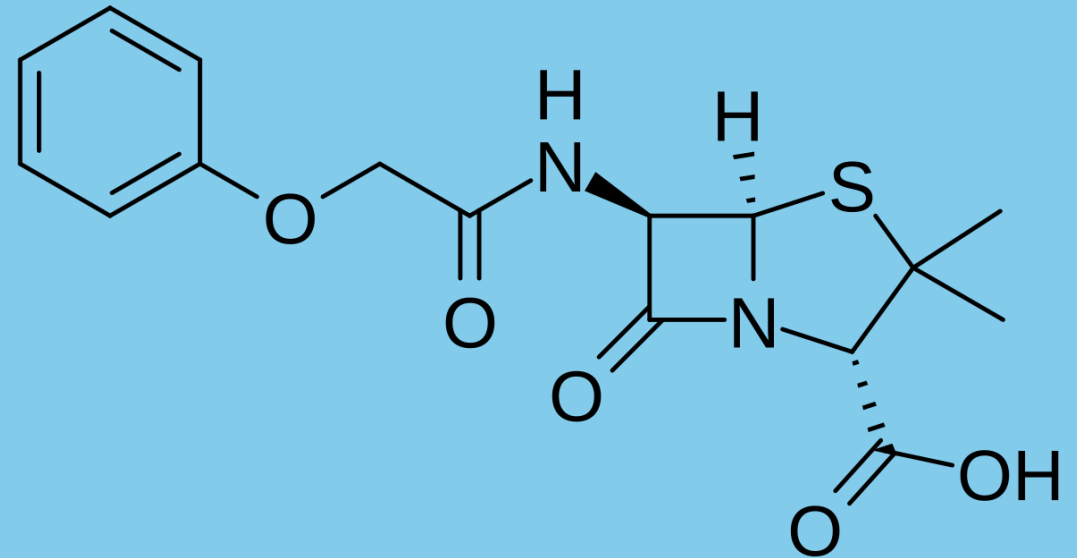
Phenoxymethylpenicillin (penicillin V)



Penicillin G



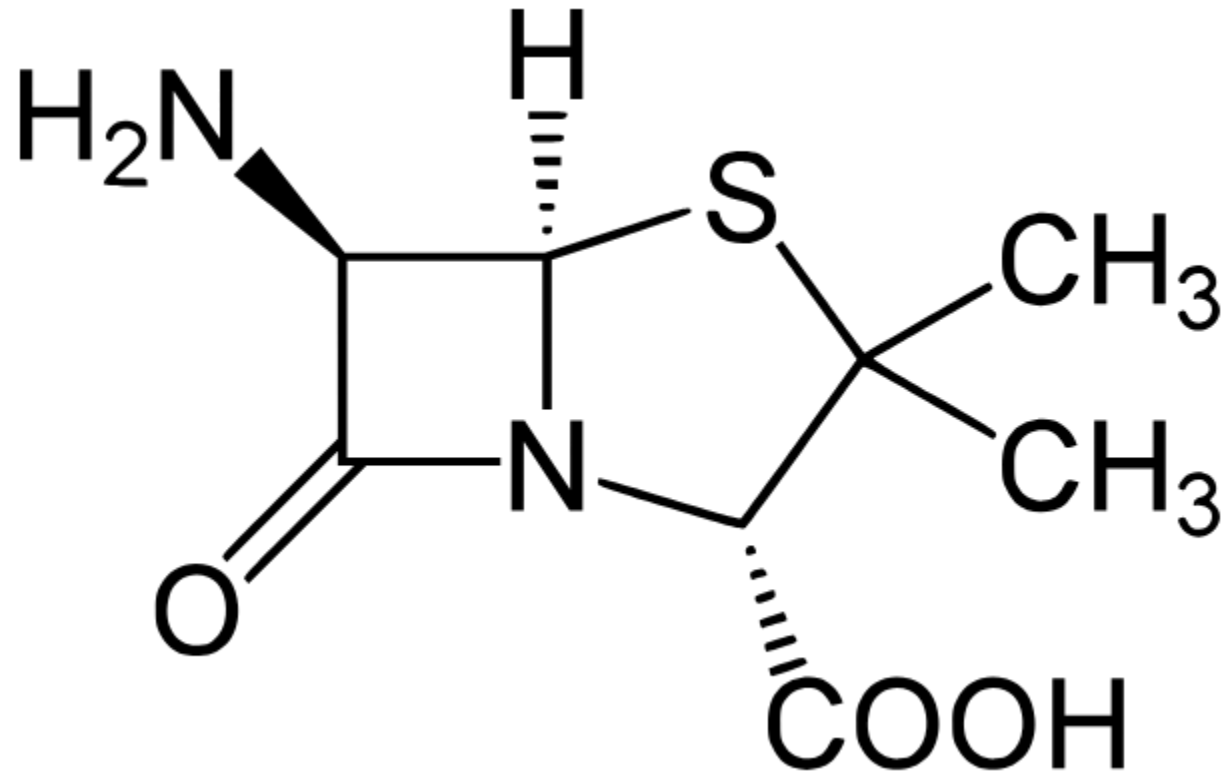
Penicillin V



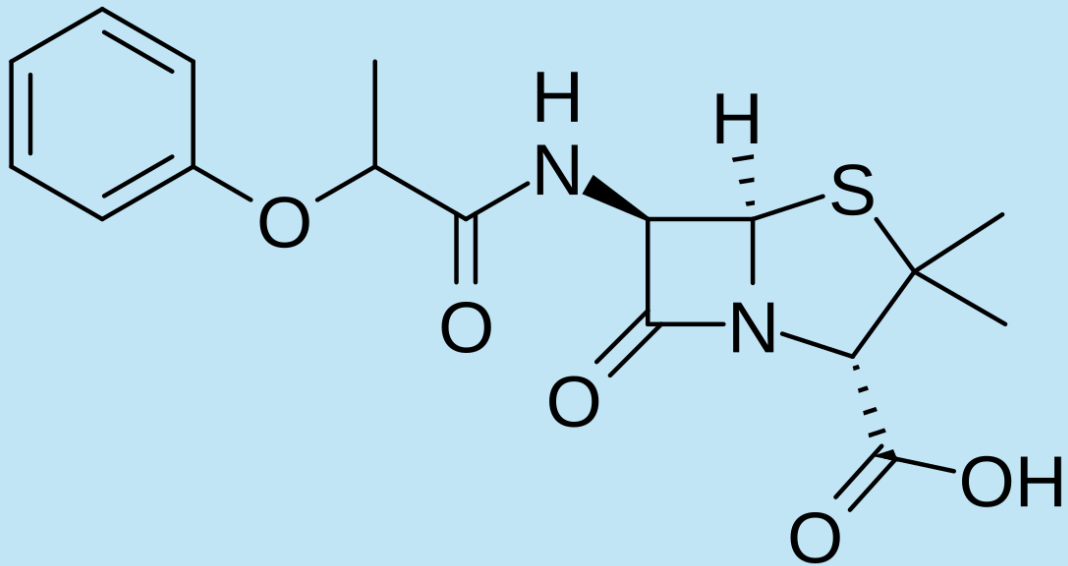
Hans Christian Joachim Gram



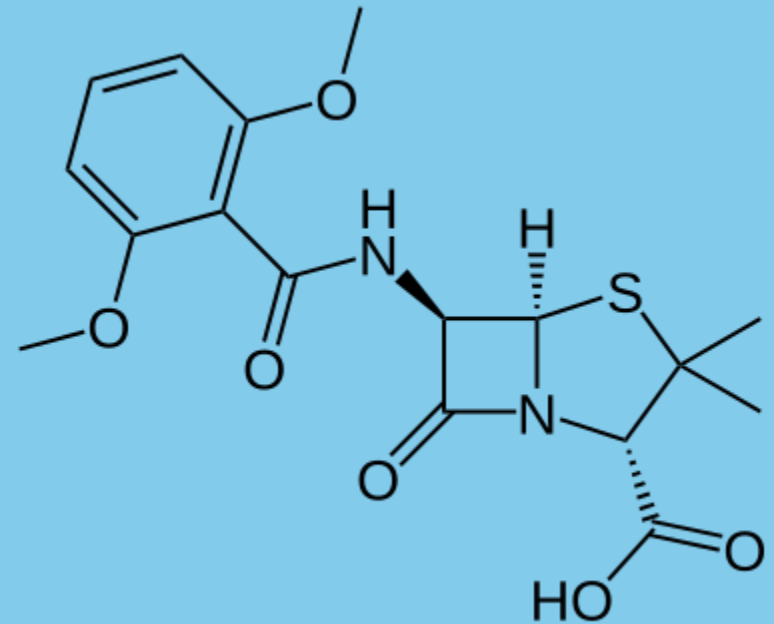
6-aminopenicillanic acid



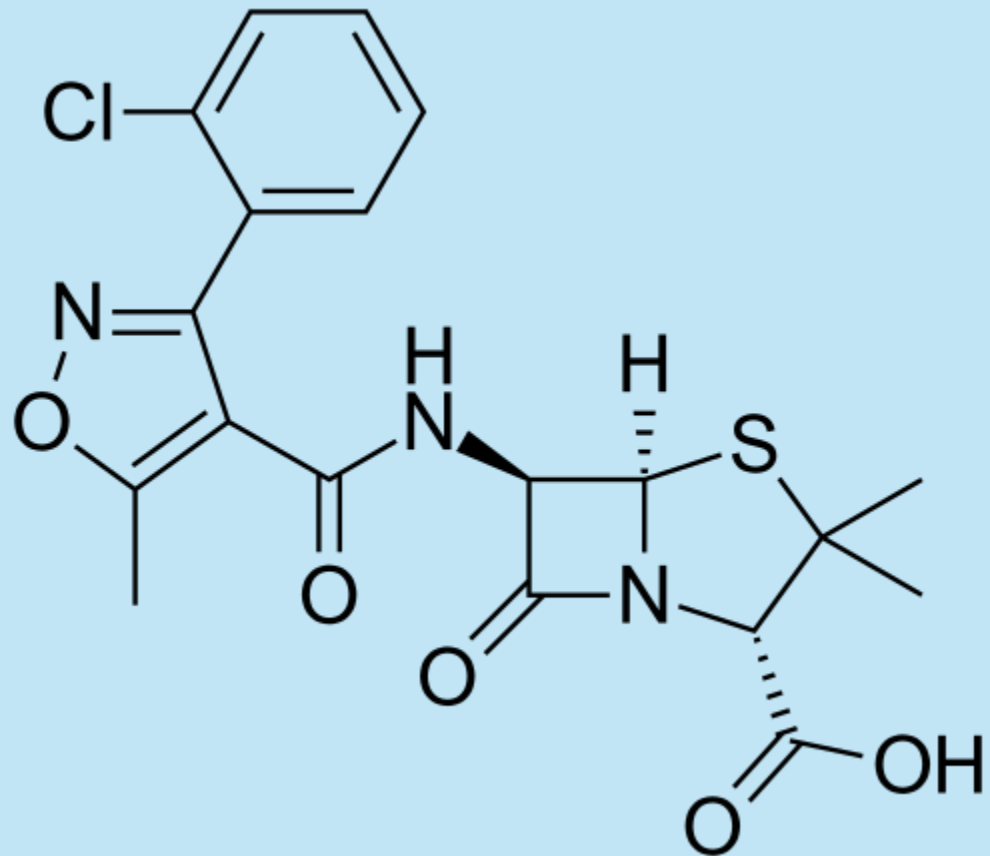
Phenethicillin



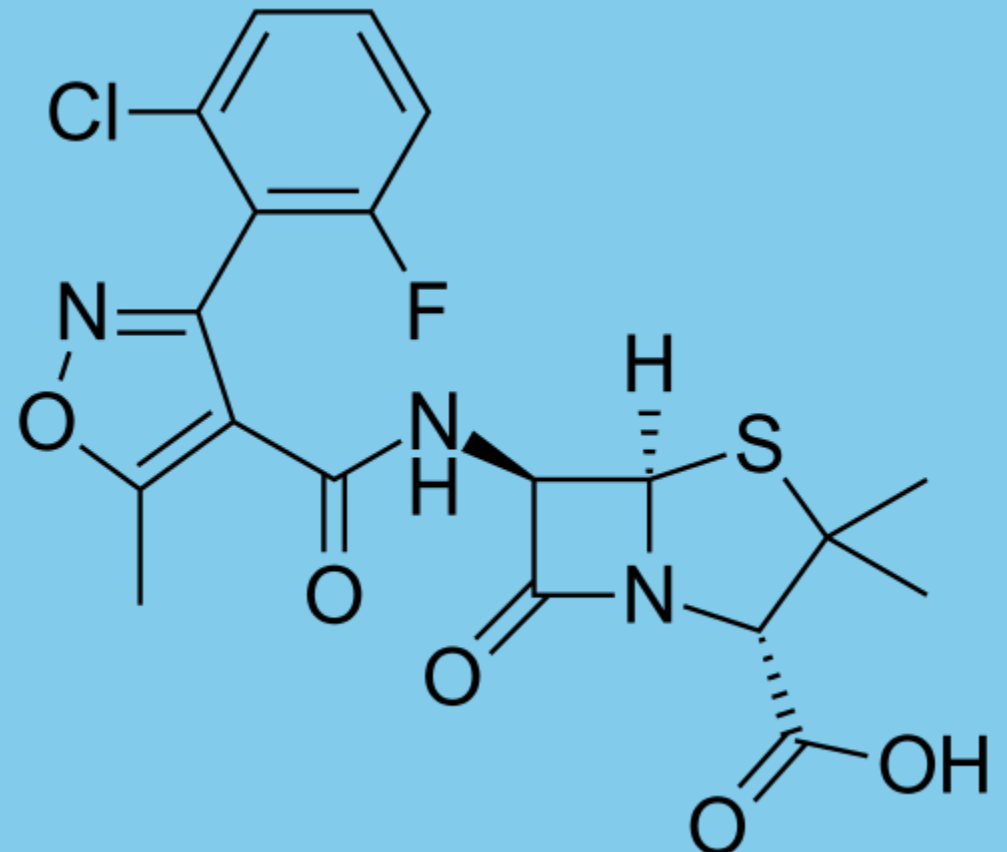
Methicillin



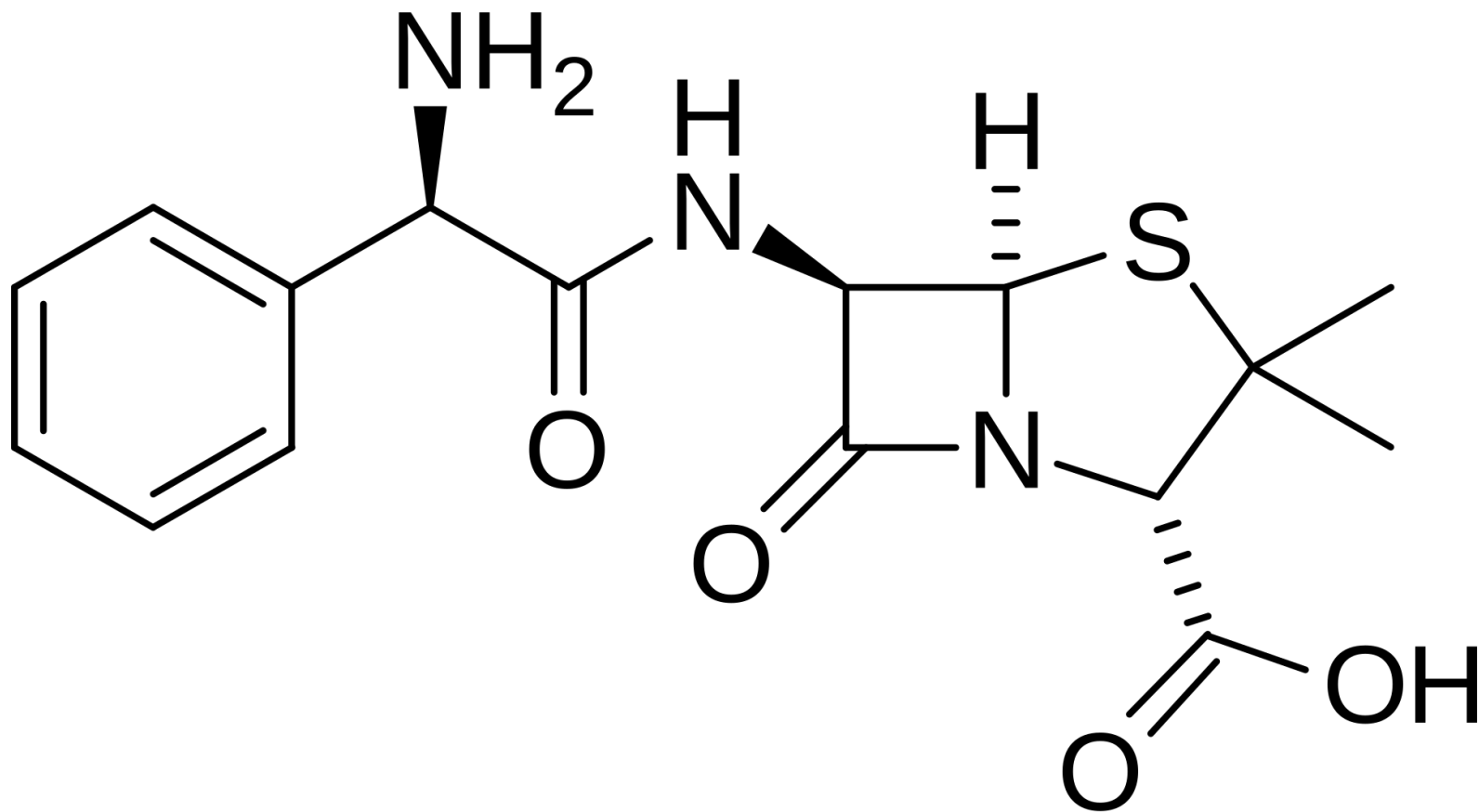
Cloxacillin



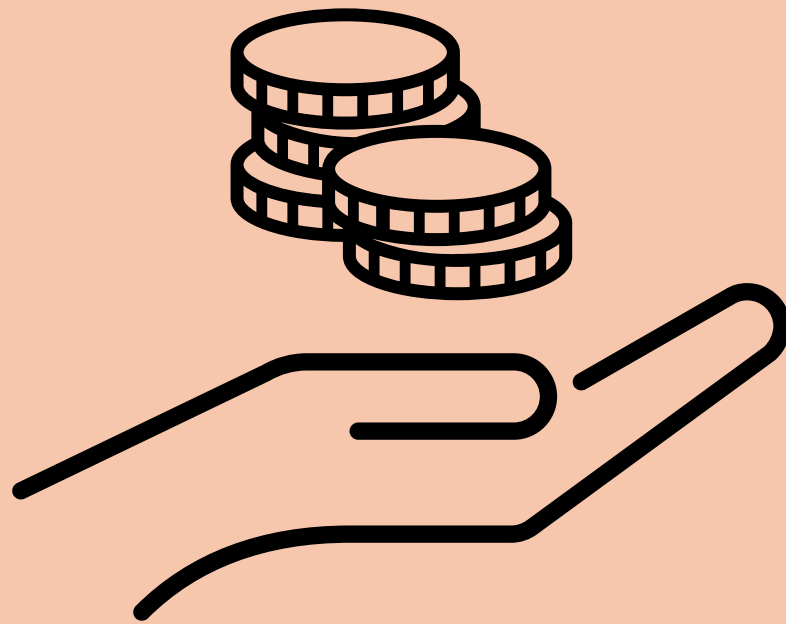
Flucloxacillin



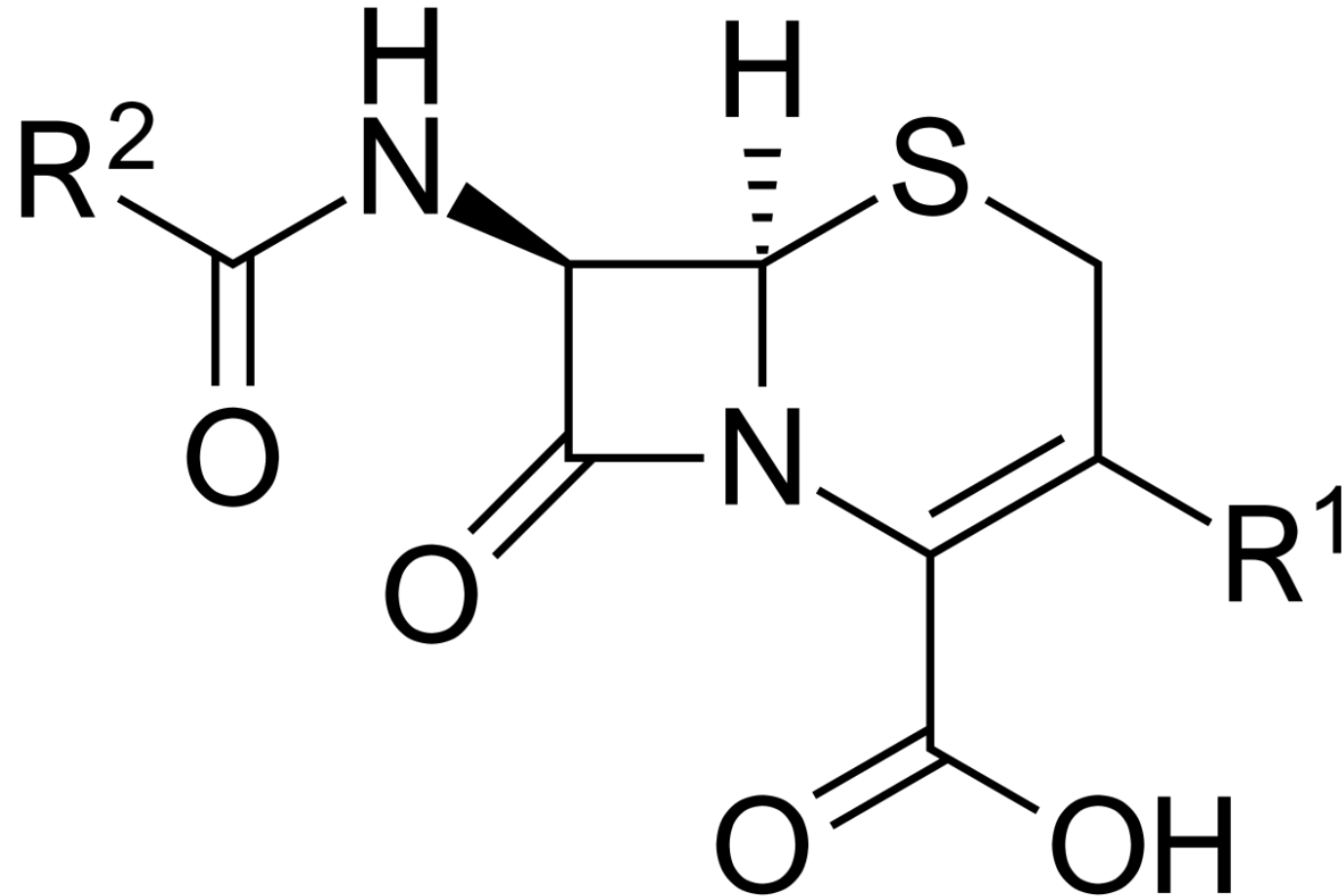
Ampicillin



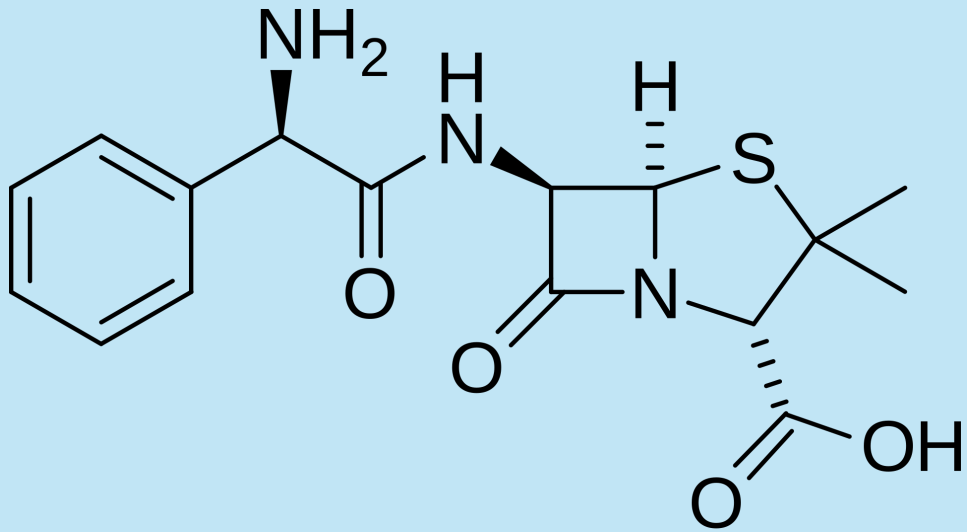
Commerce



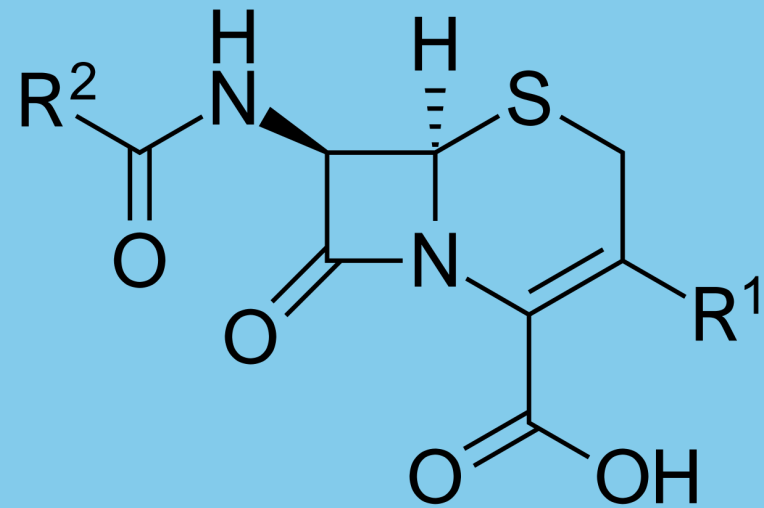
Cephalosporins



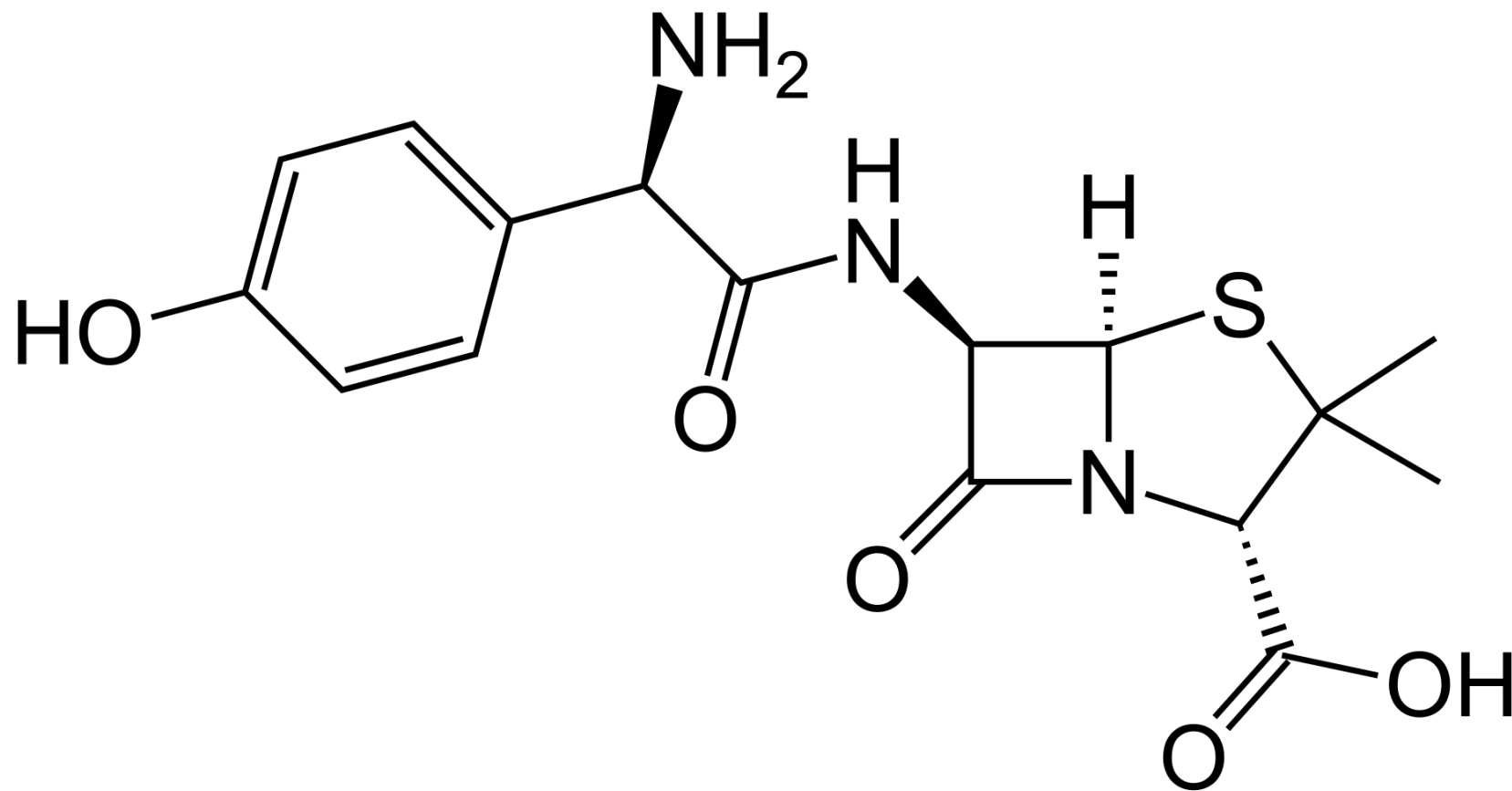
Ampicillin



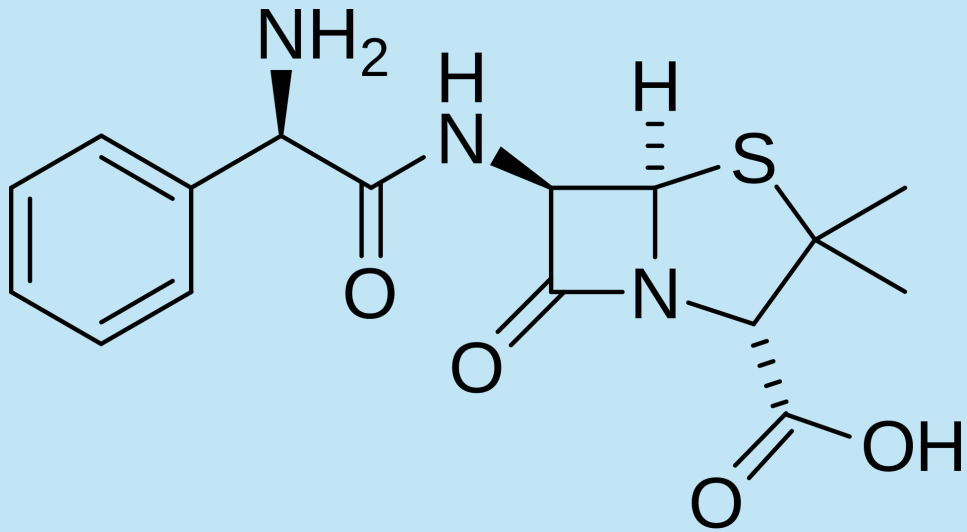
Cephalosporins



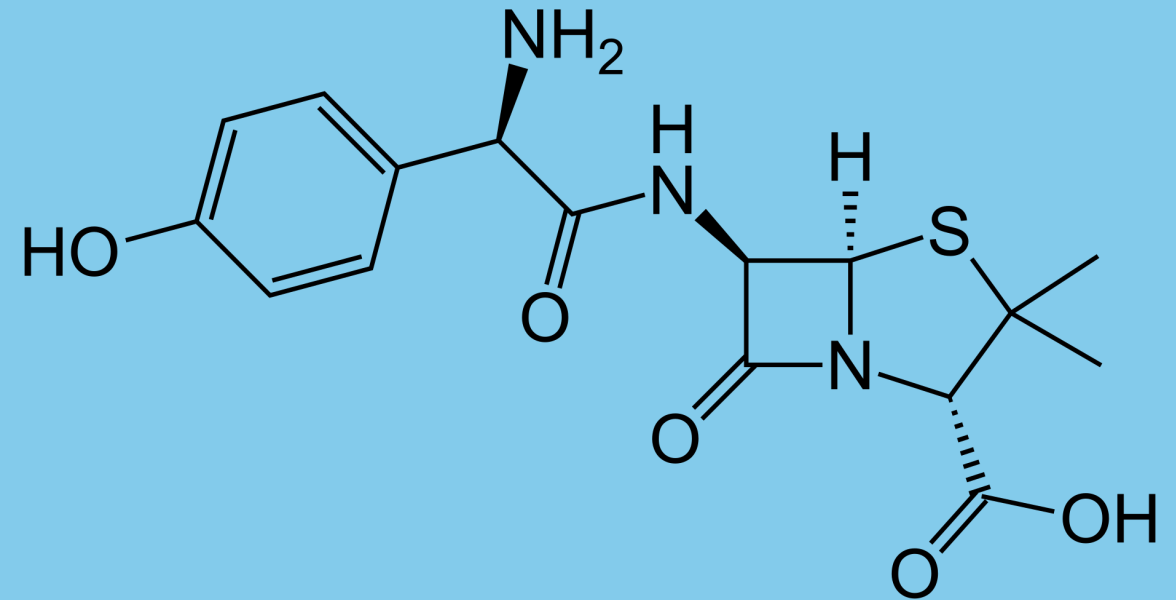
Amoxicillin



Ampicillin



Amoxicillin



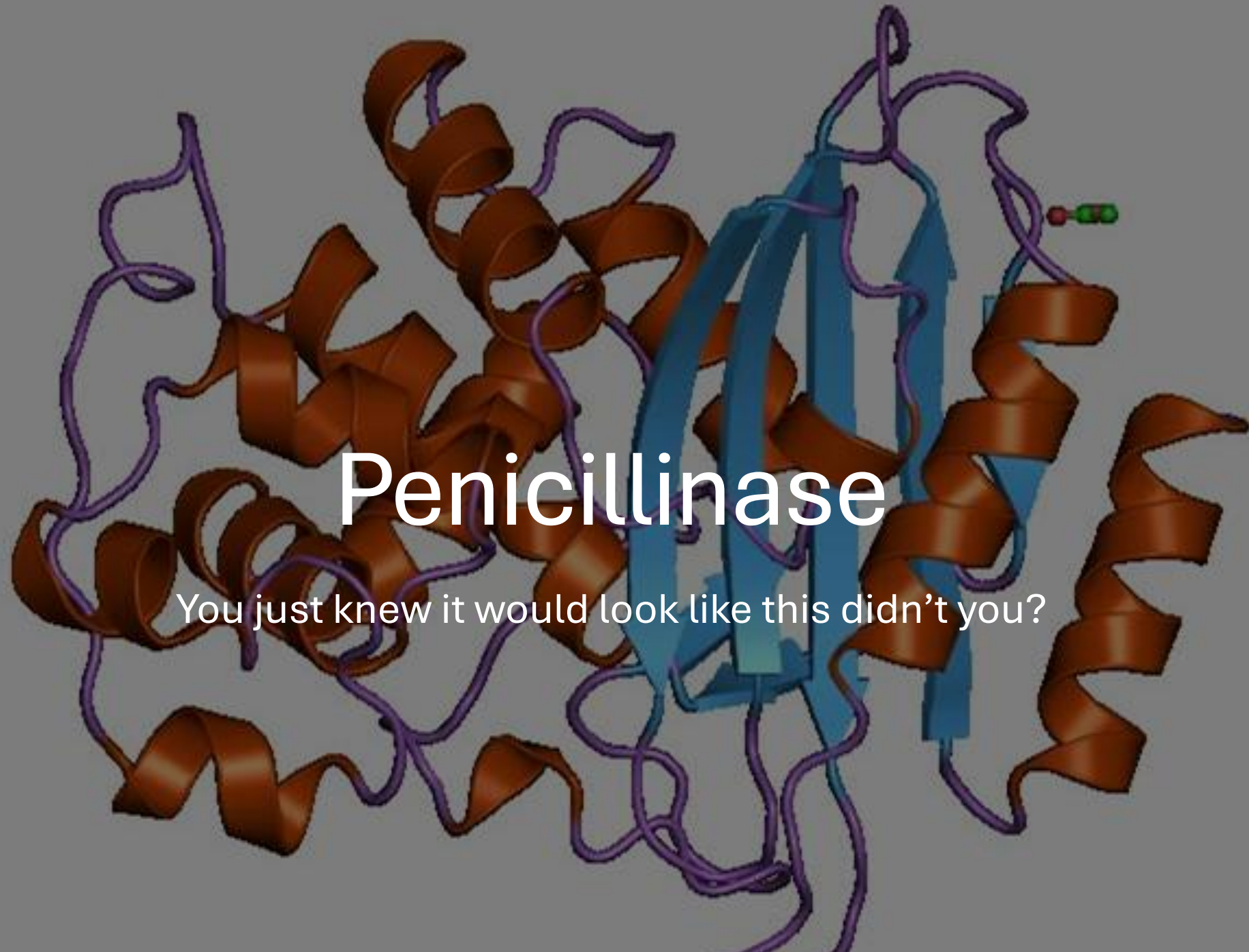






Amoxil (Bencard)

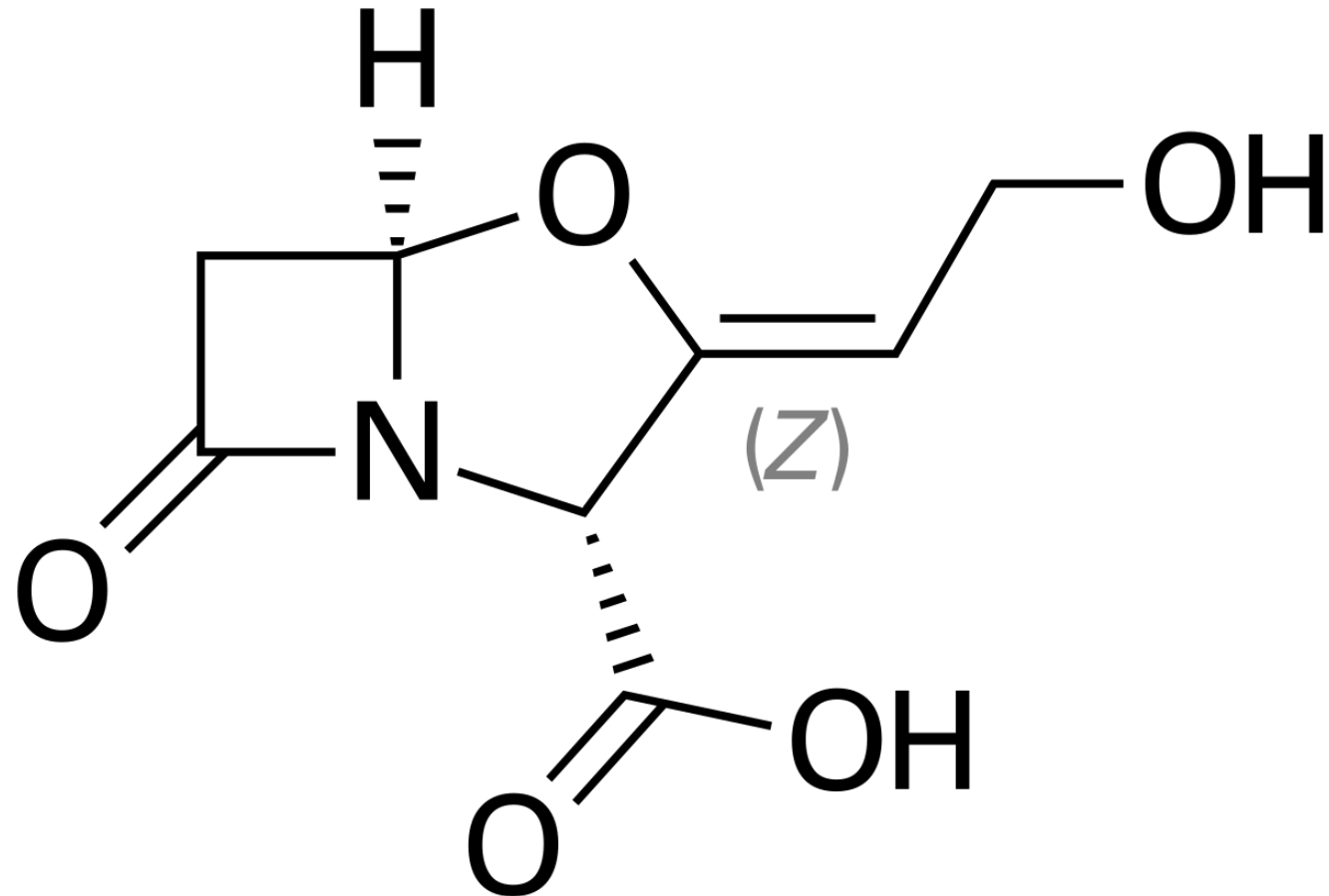




Penicillinase

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

Clavulanic Acid



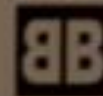
Co-amoxiclav 500mg/125mg
Film-coated Tablets

500mg/125mg

amoxicillin/clavulanic acid

Clavulanic acid plus amoxicillin

(Augmentin, Co-amoxiclav)

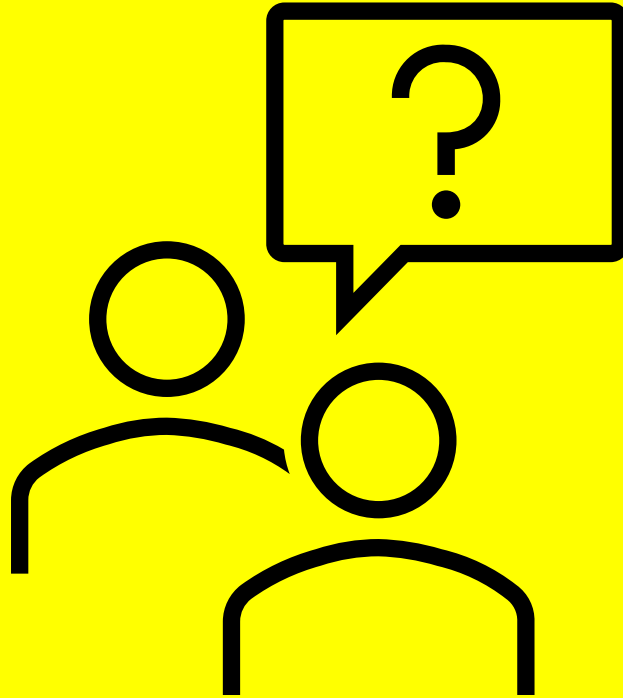


BROWN & BURK



21 Film-coated tablets

Morality



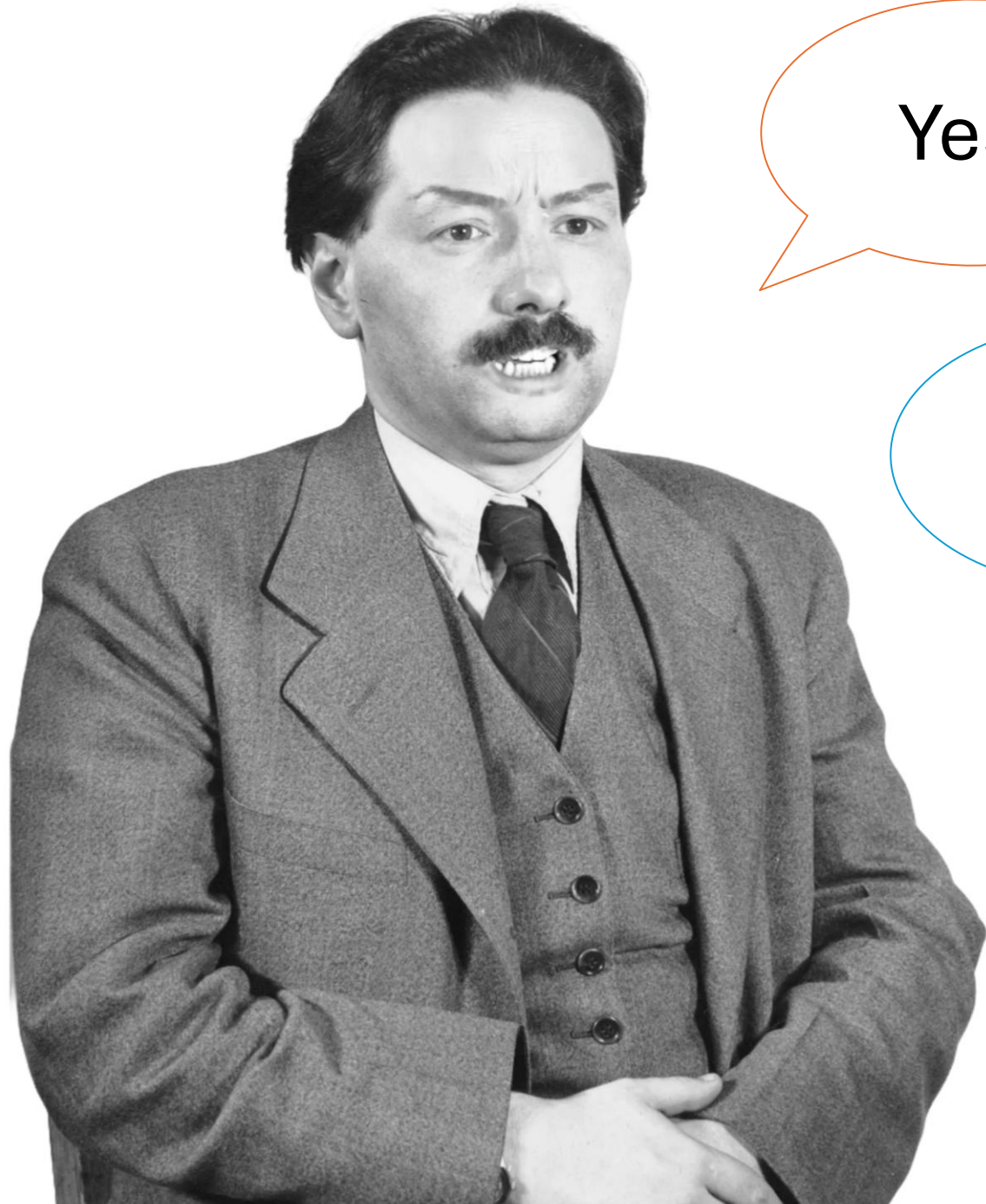
The chemical name of amoxicillin

(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

50

AUSTRALIA

50

FIFTY DOLLARS



FLOREY

WRG 439338

Bl. Frost

John Evans

GOVERNOR, RESERVE BANK OF AUSTRALIA, SECRETARY TO THE TREASURY

THIS AUSTRALIAN NOTE IS LEGAL TENDER THROUGHOUT AUSTRALIA AND ITS TERRITORIES

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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

