CEM-402_Unit-03: Biological Active Molecules

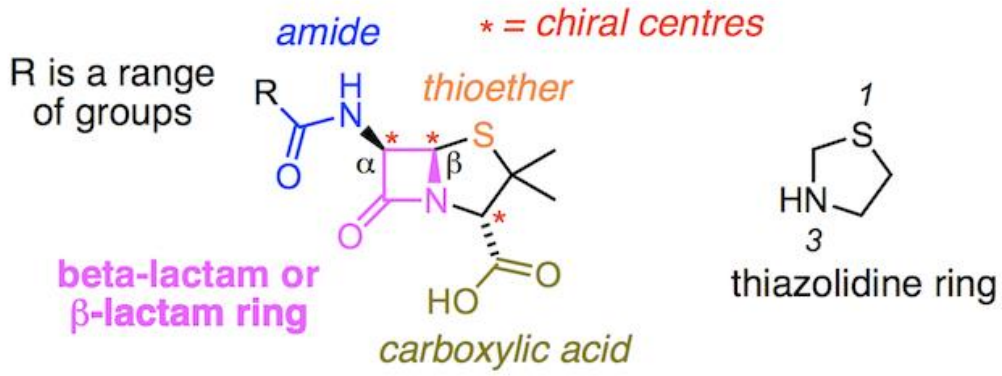
Antibiotic

A substrate or medicine (such as penicillin, Cephalosporin, Streptomycin, etc.) that inhibits the growth of or destroys microorganisms.

Penicillin

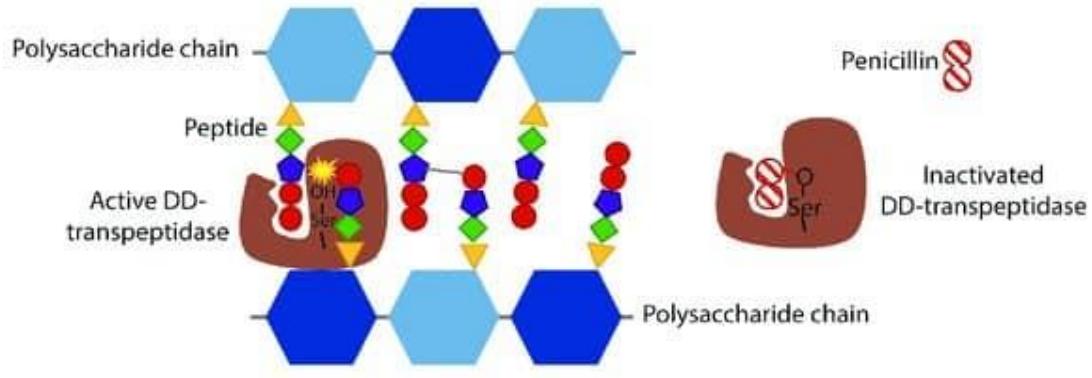
Penicillin is a medication used to manage and treat a wide range of infections. It is in the beta-lactam antibiotic class of drugs.

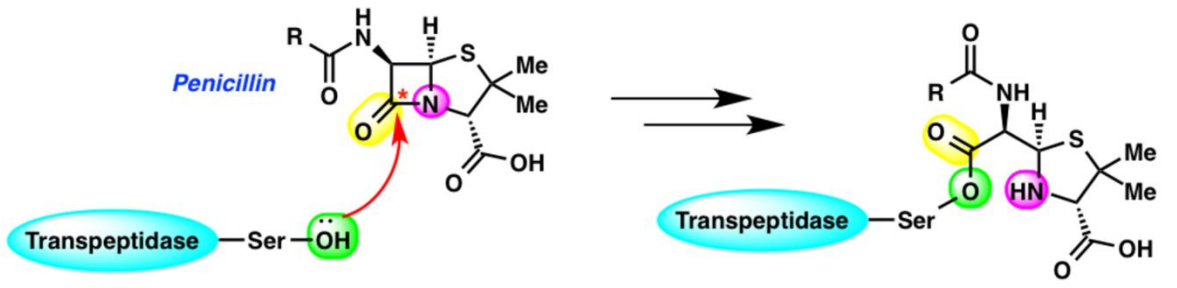
Penicillin V potassium is used to treat certain infections caused by bacteria such as pneumonia and other respiratory tract infections, scarlet fever, and ear, skin, gum, mouth, and throat infections.

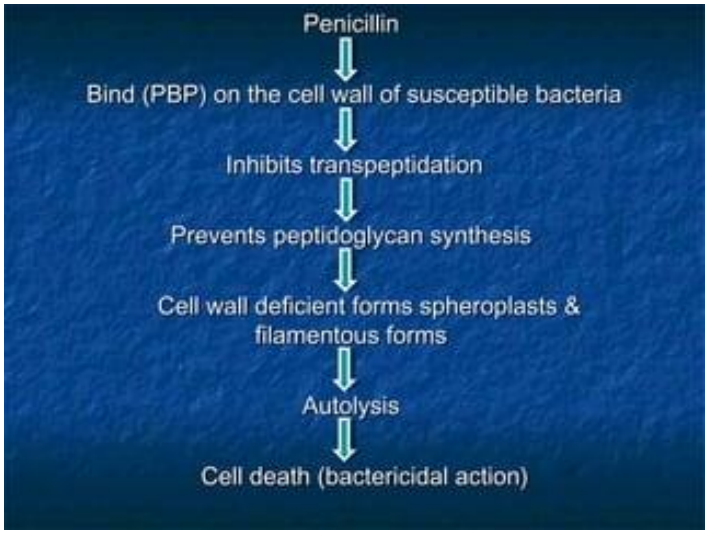


Mechanisms of Action

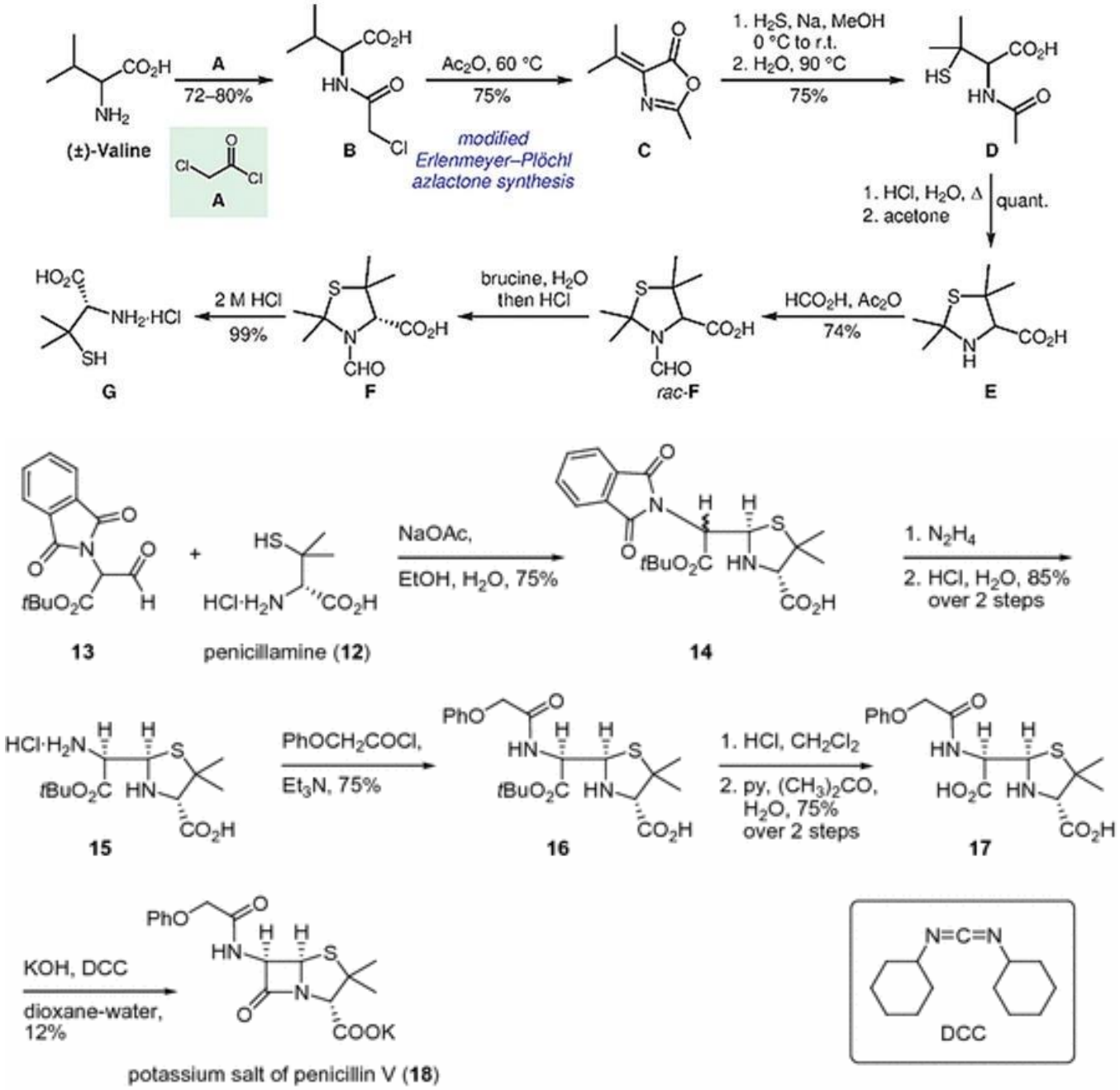
All penicillin derivatives produce their bactericidal effects by inhibition of bacterial cell wall synthesis. Specifically, the cross linking of peptides on the polysaccharide chain is prevented.





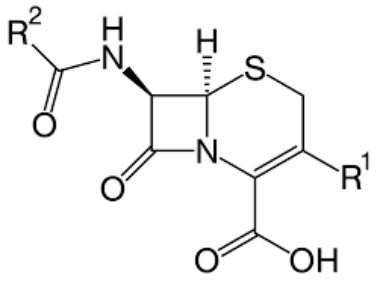


Synthesis of Penicillin-V

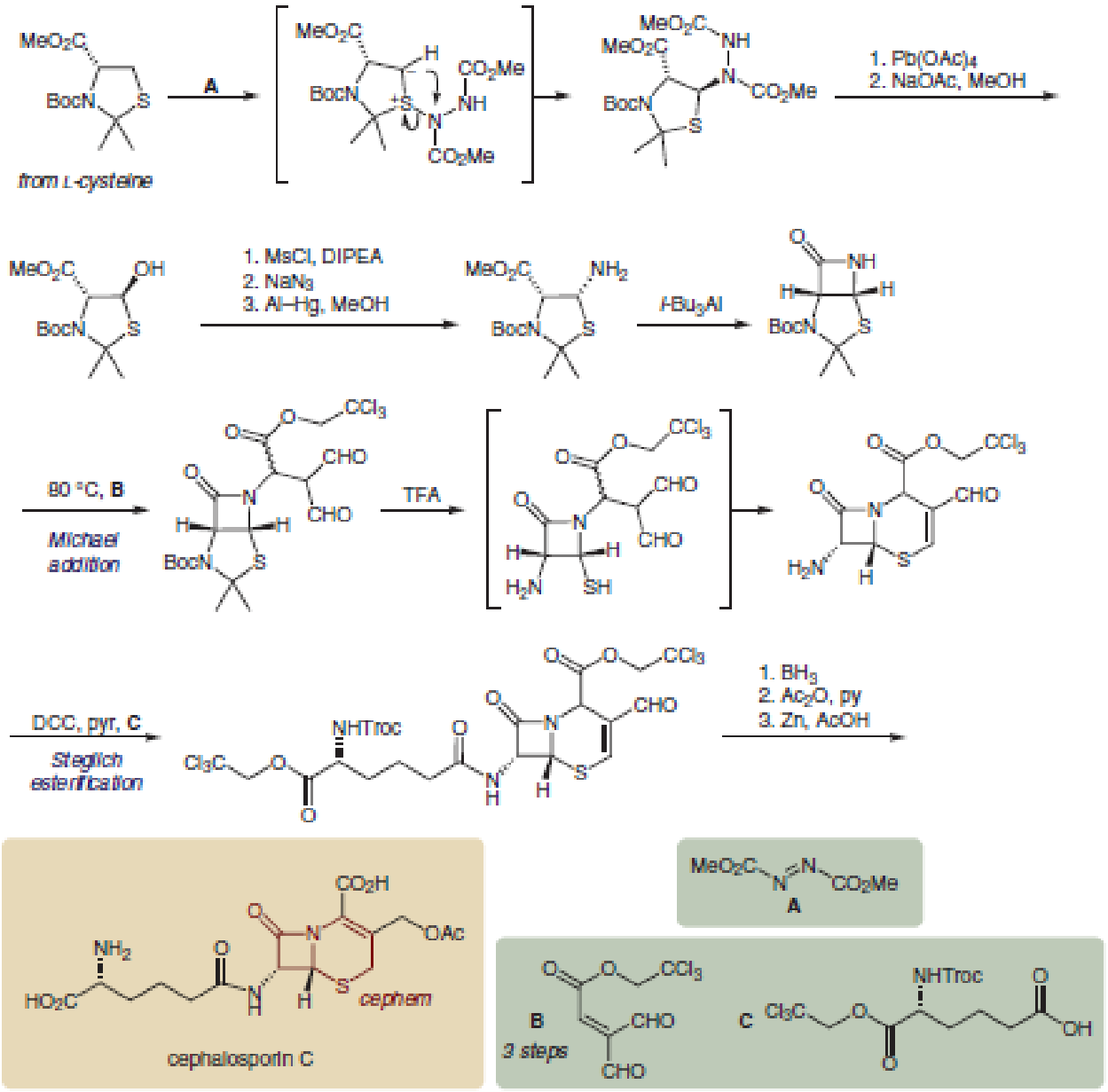


Cephalosporin

Cephalosporins are beta-lactam antimicrobials used to manage a wide range of infections from gram-positive and gram-negative bacteria. The five generations of cephalosporins are useful against skin infection, resistant bacteria, meningitis, and other infections.

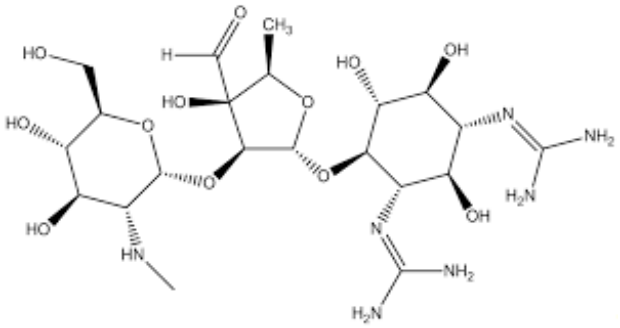


Total Synthesis of Cephalosporin C



Streptomycin

Streptomycin is the first discovered aminoglycoside antibiotic, originally isolated from the bacteria Streptomyces griseus. It is now primarily used as part of the multi-drug treatment of pulmonary tuberculosis. It has additional activity against several aerobic gram-negative bacteria.



Synthesis of Streptomycin