Brand Name: Cubicin Generic: daptomycin Type: small molecule

Year Accepted/Phase: 2003

Mechanism:

Daptomycin is a lipopeptide antibiotic that exerts its bactericidal effects by binding to bacterial cell membranes and causing rapid depolarization. This depolarization disrupts multiple essential functions within the bacterial cell, including protein, DNA, and RNA synthesis, leading to cell death.

Chemical Structure:

Indication:

Cubicin is indicated for the treatment of:

Complicated skin and skin structure infections (cSSSI) caused by susceptible Gram-positive bacteria.

Staphylococcus aureus bloodstream infections (bacteremia), including those with right-sided infective endocarditis.

Clinical trials:

Clinical Trials for Complicated Skin and Skin Structure Infections (cSSSI)

Purpose: Evaluate the efficacy and safety of daptomycin in the treatment of cSSSI caused by Gram-positive bacteria.

Dates: Conducted from 2001 to 2003.

Results: The trials demonstrated that daptomycin was non-inferior to standard therapy (such as vancomycin or penicillinase-resistant penicillins). Daptomycin achieved clinical success rates similar to comparator agents but with a once-daily dosing regimen.

Impact: These findings led to the FDA approval of daptomycin for the treatment of cSSSI in September 2003.

Clinical Trials for Staphylococcus aureus Bacteremia

Purpose: Compare the efficacy of daptomycin with standard therapy (vancomycin or semi-synthetic penicillins) in the treatment of Staphylococcus aureus bacteremia and right-sided infective endocarditis.

Dates: Conducted from 2002 to 2004.

Results: The trial showed that daptomycin was as effective as standard therapy for treating Staphylococcus aureus bacteremia, including cases complicated by right-sided infective endocarditis. Daptomycin's safety profile was comparable to that of standard treatments.

Impact: The results supported the expanded use of daptomycin for Staphylococcus aureus bacteremia, leading to its approval for this indication in 2006.