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Surotomycin

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1. DESCRIPTION

Surotomycin (CB-183,315; MK-4261) belongs to the lipopeptides and is a semisynthetic derivate cyclic tail analogue of daptomycin (see Chapter 45, Daptomycin) designed specifically to improve the activity against *Clostridium difficile* (Yin *et al.*, 2015). It has the same peptide sequence as daptomycin but has an aromatic ring containing an unsaturated lipid tail, (E)-3-(4-pentylphenyl) but-2-enoic acid tail. The molecular formula for surotomycin is $C_{77}H_{10}1N_{17}O_{26}$ with a corresponding molecular weight of 1680.7 g/mol (PubChem, 2016). The molecular structure of surotomycin is depicted in Figure 50.1. Its mechanism of action is similar to that of daptomycin, cell membrane depolarization leading ultimately to cell death (Mascio *et al.,* 2012). It was developed by Cubist Pharmaceuticals but is now owned by Merck & Co. (North Wales, PA).

Surotomycin has, similar to daptomycin, good activity against most Gram-positive bacteria, including enterococci and methicillin-resistant *Staphylococcus aureus*. Although it is a promising alternative to vancomycin and metronidazole for the treatment of *C. difficile*–associated diarrhea (CDAD), with activity against both growing and nongrowing *C. difficile* (Alam *et al.,* 2015), further development remains unclear because of dissapointing results in clinical trials.

2. KEY FEATURES

The antimicrobial spectrum of surotomycin is comparable to daptomycin but is significantly more active against *C. difficile*. Surotomycin has no significant activity against Gram-negatives, and, although concentrations in stool are very high (Chandorkar, 2013b), minimum inhibitory concentration (MICs) are even higher (Citron *et al.,* 2012). It should be

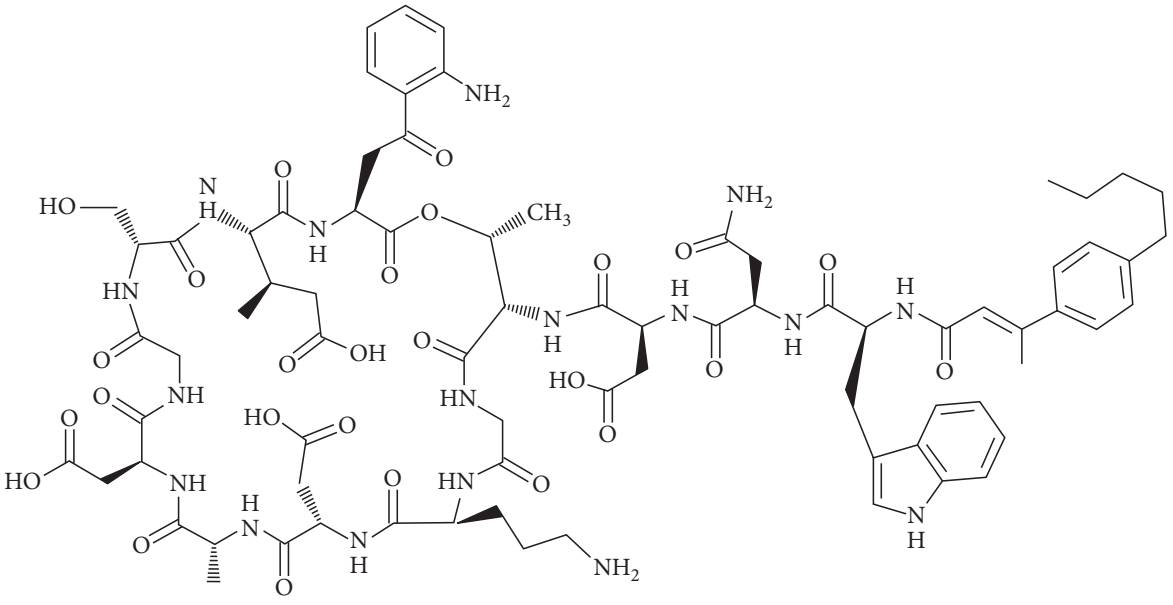

Figure 50.1. Molecular structure of surotomycin.