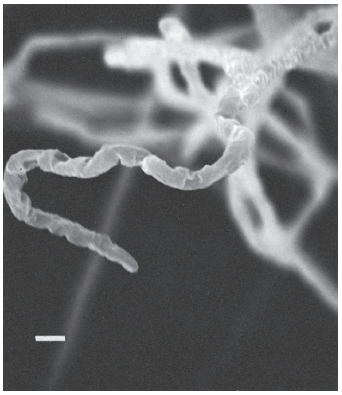
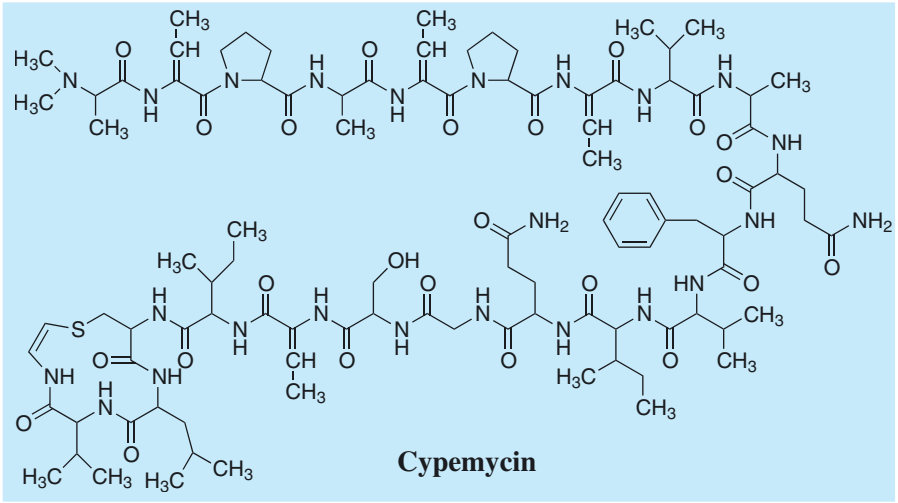
Cypemycin

1. Discovery, producing organism and structure[1,2)]

Cypemycin was isolated from the culture broth of the actinomycete strain OH-4156[1)] and found to possess cytocidal activity against P388 leukemia cells *in vitro*. Its structure was determined by means of FAB-MS, NMR and amino acid analysis[2)].



Streptomyces sp. OH-4156



Cypemycin

2. Physical data

White powder. $C_{99}H_{154}N_{24}O_{24}S$; mol wt; 2096.52. Sol. in MeOH, EtOH, benzene,$CHCl_3$. Insol. in H_2O, acetone, EtOAc, hexane.

3. Biological activity[1)]

1) Cytotoxicity of cypemycin against mammalian cells

Cell line	Origin	IC_{50} (μg/ml)
HeLa S3	Human cervix carcinoma	>25
B16 melanoma	Mouse melanoma	>25
P388 leukemia	Mouse leukemia	1.3
L929	Mouse fibroblast	>25
HCC-1	Human liver tumor	>25
HCC-M	Human liver tumor	>25
Alex	Human liver tumor	>25

2) Cypemycin showed antimicrobial activity only against *Micrococcus luteus* (MIC = 0.2 μg/ml) and no activity against other Gram-positive and -negative bacteria, fungi, or yeast.

4. Biosynthesis[3-5)]

The biosynthetic gene cluster for cypemycin was identified and the biosynthetic pathway was proposed. The precursor peptide is synthesized ribosomally and the unique residues, such as aminovinyl cysteine, L-allo-isoleucine and *N*,*N*-dimethylalanine, are formed by posttranslationally modifications.

5. References

1. [522] K. Komiyama *et al*., *J*. *Antibiot*. **46**, 1666-1671 (1993)
2. [556] Y. Minami *et al*., *Tetrahedron Lett*. **35**, 8001-8004 (1994)
3. J. Claesen *et al*., *Proc*. *Natl*. *Acad*. *Sci*. *USA* **107**, 16297-16302 (2010)
4. C. S. Sit *et al*., *Acc*. *Chem*. *Res*. **44**, 261-268 (2011)
5. Q. Zhang *et al*., *FEBS Lett*. **586**, 3391-3397 (2012)