

VIRGINIAMYCIN: NOMENCLATURE

Sir:

We wish to report the nomenclature in the virginiamycin* area and the relationship of this antibiotic with those of the same family: mikamycin, pristinamycin, ostreogrycin, streptogramin, PA 114, vernamycin, doricin and patricin.

The antibiotic virginiamycin is a mixture of two antibiotic components: factor M and factor S. The first is mainly active against *Micrococcus aureus*, the second mainly against *Bacillus subtilis*.

The analysis of a sample of virginiamycin shows that the percentages of minor factors are very low. This allows to consider the antibiotic as composed only by factor M and factor S; minor factors are taken as impurities like penicillins K and X in penicillin G.

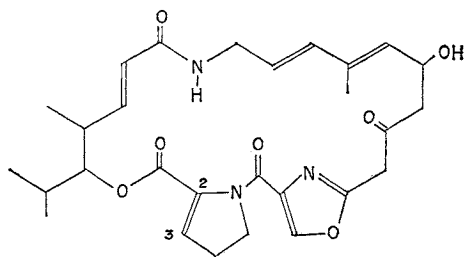
Factor M: Factor M** is a macrocyclic lactone, $C_{28}H_{35}N_3O_7$ (MW 525.607) with the structure I.

Virginiamycin M¹⁻³⁾ is identical with ostreogrycin A¹⁻⁶⁾, pristinamycin IIA¹⁾, streptogramin A³⁾, PA 114 A¹⁻³⁾, vernamycin A¹⁾ and mikamycin A¹⁾.

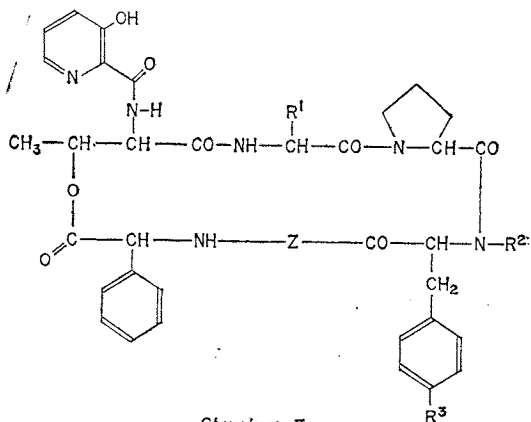
Virginiamycin M₂¹⁾ (structure I with Δ -2, 3-saturated) is identical with ostreogrycin G^{1,2,7)} and pristinamycin IIB¹⁾.

Factor S: Factor S*** is a depsipeptide, $C_{43}H_{49}N_7O_{10}$ (MW 823.911) with the structure II ($R^1=C_2H_5$, $R^2=CH_3$, $R^3=H$ and Z=4-oxopipercolic acid).

The structural relationship of factor S with close-related depsipeptides is found in Table I.



Structure I



Structure II

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* Formerly named by its trade mark Staphylomycin.

** Also named factor M₁ by some authors.

*** Also named factor S₁ by some authors.

Table 1.

Names	R ¹	R ²	R ³	Z
Patricin B ¹³⁾	C ₂ H ₅	CH ₃	H	Pipecolic acid
Virginiamycin S ^{8-12,22)}	C ₂ H ₅	CH ₃	H	4-Oxopipecolic acid
Virginiamycin S ₄ ^{11,22)*}	CH ₃	CH ₃	H	4-Oxopipecolic acid
Virginiamycin S ₂ ^{11,22)}	C ₂ H ₅	H	H	4-Hydroxypipecolic acid
Virginiamycin S ₃ ^{11,22)}	C ₂ H ₅	CH ₃	H	3-Hydroxy-4-oxopipecolic acid
Streptogramin B ³⁾	C ₂ H ₅	CH ₃	N(CH ₃) ₂	4-Oxopipecolic acid
Mikamycin IA ^{1-3,14)}				
PA 114 B 1 ^{1-3,15)}				
Pristinamycin IA ^{1,3)}				
Vernamycin B α ^{1-3,17)}				
Ostreogrycin B ^{1-3,16,17)}	CH ₃	CH ₃	N(CH ₃) ₂	4-Oxopipecolic acid
Pristinamycin IC ¹⁾				
Vernamycin B γ ^{1-3,17)}				
Ostreogrycin B ₁ ^{1-3,17)}	C ₂ H ₅	CH ₃	NHCH ₃	4-Oxopipecolic acid
Pristinamycin IB ^{1,3)}				
Vernamycin B β ^{1-3,17)}				
Ostreogrycin B 2 ^{1-3,12,17)}	CH ₃	CH ₃	NHCH ₃	4-Oxopipecolic acid
Vernamycin B δ ^{2,17)}				
Ostreogrycin B 3 ¹⁸⁾	C ₂ H ₅	CH ₃	N(CH ₃) ₂	3-Hydroxy-4-oxopipecolic acid
Vernamycin C ¹⁹⁾	C ₂ H ₅	CH ₃	N(CH ₃) ₂	Aspartic acid
Doricin ^{2,20,21)}				
Patricin A ¹⁸⁾	C ₂ H ₅	CH ₃	H	Proline

* In ref. 11 and 22, S₁ must be read S₄.

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