

## ALTERNATIVE ANTIBIOTICS WITH SPECIFIC ANTI-STAPHYLOCOCCAL ACTIVITY

Alexander Pauli

ReviewScience, 90513 Zirndorf, Fürther Str. 13, Germany

The development of multiple resistance of *Staphylococcus aureus* towards clinically relevant antibiotics was the reason to analyze the effectiveness of patented antibiotics towards *S. aureus* back to the year 1948. The number of patents covered by this analysis exceeds 600 and the number of antibiotics 1100 (1).

The effectiveness of the respective antibiotics is expressed as 'Therapeutic Index' (TI) according to the formula  $TI = LD50 / MIC$ , which calculates the toxicity of antibiotics towards microorganisms *in vitro* (MIC = minimal inhibitory concentration in ppm) and the toxicity towards animals *in vivo* (LD50 = that dose causing death of 50% of test animals in mg/kg/body weight). The toxicity data of antibiotics towards animals have been determined on several administration routes, and therefore, it was distinguished between oral, intraperitoneal (ip) and intravenous (iv) 'TIs'. The TIs (iv, ip) of vancomycin were used as reference and only such antibiotics are listed among results which show higher TIs than the reference compound itself.

To select antibiotics with anti-staphylococcal activity having different chemical basic structures than antibiotics used in the therapy of *S. aureus* infections, antibiotics belonging to the following groups were excluded from this analysis: tetracyclines, beta-lactams, macrolides, aminoglycosides, ansa-type antibiotics and quinolones. In a second attempt the selected antibiotics were checked for occurrence of microbial resistances and positive compounds were also excluded.

The selected antibiotics on the basis of iv toxicity data are nosiheptide, platomycin B, diumycin A, moenomycin, pholipomycin, thiostrepton, siomycin, platomycin A, and FR-900451. On the basis of ip toxicity data danomycin, nosiheptide, thermorubin, thiostrepton, siomycin, platomycin B, A-82846-A, diumycin A, enduradycin, A-47934, and thiopeptin A1 are selected. On the basis of oral toxicity data chlorobiocin, pactamycin, resistomycin Bayer, actinomycin C complex, carriomycin, cervinomycin A2 monoacetate, cervinomycin A1 triacetate, AM-5344-A2, macromomycin, aflastatin A, T-2636-C and amicitin showed promising results.

The data on the selected antibiotics indicate that a greater number of compounds exist being more effective against *S. aureus* than vancomycin. Their usefulness as clinical therapeutics depends on further factors, such as the failure of cross-resistance to therapeutically relevant antibiotics, satisfactory bioavailability, and absence of side effects.

### References

- 1) AMICBASE-EssOil: Database on Natural Antimicrobials, ReviewScience, Germany (1999-2002)

---

### Citation:

Pauli, A.: Alternative Antibiotics with Specific Anti-Staphylococcal Activity; International Conference on Emerging Infectious Diseases, Program and Abstracts Book, Atlanta, USA, March 24-27 (2002), p. 136