**Sophorolipids: Renewable resources for chemical derivatization**

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**Introduction**

Sophorolipid = sophorose head + fatty acid tail

- Renewable resources
- Non-pathogenic yeast
- Complex structure
- Interesting building blocks for chemical derivatization

**Objectives**

Synthesis of innovative sophorolipid derivatives

- High added-value products for the pharmaceutical sector

**Sophorolipid aldehyde intermediate**

- Hydroxylated and non-hydroxylated quaternary ammonium salts with an octadecyl chain
- Evaluation influence carbohydrate head on antimicrobial activity and transfection efficiency

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**Sophorolipid amines**

- No antimicrobial activity against *E. coli* LMG 8063, *K. pneumoniae* LMG 2095, *S. aureus* LMG 8064 and *B. subtilis* LMG 13579

**Sophorolipid amine oxides**

- Evaluation antimicrobial activity against *E. coli* LMG 8063, *K. pneumoniae* LMG 2095, *P. aeruginosa* PAO1, *S. aureus* ATCC 6538 and *S. aureus* Mu50
- Only weak activity for 2i against *P. aeruginosa* PAO1 (*MIC*: >1000 µg/mL)

**Quaternary ammonium sophorolipids**

- Evaluation antimicrobial activity against *E. coli* LMG 8063, *K. pneumoniae* LMG 2095, *S. aureus* LMG 8064 and *B. subtilis* LMG 13579
- Significant growth inhibition against Gram-positive strains for 13 derivatives
- Minimum inhibitory concentration (MIC) determination for active derivatives
- Control antibiotic: Gentamicin sulfate

**Bolaamphiphilic sophorolipids**

- Evaluation antimicrobial activity against *E. coli* LMG 8063, *K. pneumoniae* LMG 2095, *P. aeruginosa* PAO1, *S. aureus* ATCC 6538 and *S. aureus* Mu50
- Determination Minimum inhibitory (MIC) and bactericidal (MBC) concentrations
- Set of 9 active derivatives against Gram-positive strains

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**Conclusion**

- Quaternary ammonium sophorolipids with octadecyl chain are most interesting derivatives
- High antimicrobial activity and transfection efficiency
- Positive influence of carbohydrate head

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