

# Tetracycline; Antimicrobial properties of its water-soluble dianionic bi-sodium salt

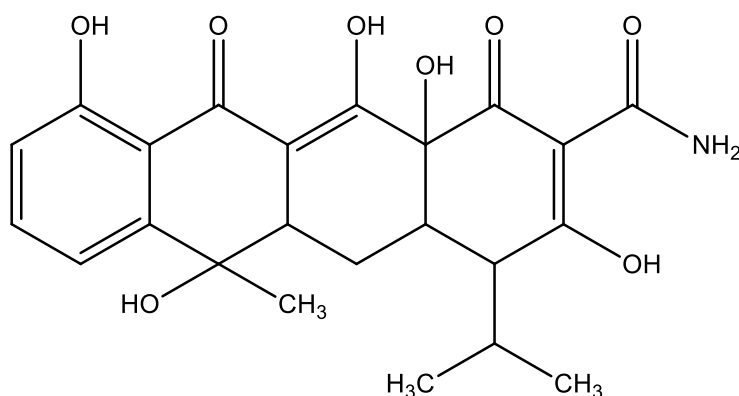
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Infectious diseases are a constant threat to human health; on top of that the extensive use of antibiotics has led to an increase in the resistance of the bacteria. Tetracycline is one of the first antibiotics discovered. It is widely used due to its broad-spectrum activity and relatively few side effects [1]. To overcome microbial infections and microbial resistance, it is necessary to develop new formulations against the growth of regular bacteria as well as multi-drug resistant bacteria [1].

In the course of our study for the development of new antibiotics by the modification of commercial drugs the sodium dianion of tetracycline (TCNa) was synthesized and characterized by melting point and spectroscopic techniques, ATR-FTIR, <sup>1</sup>H-NMR, UV/Vis. Cryoscopy was employed for the molecular weight determination. The crystal structure of TCNa<sub>2</sub> (TCNa) was also characterized by single crystal diffraction analysis. The antibacterial activity of TCNa is evaluated against Gram negative and positive bacterial species like *Pseudomonas aeruginosa* (*P. aeruginosa*), *Escherichia coli* (*E.coli*), *Staphylococcus epidermidis* (*S. Epidermidis*) and *Staphylococcus aureus* (*S. Aureus*). The in vitro toxicity of TCNa was evaluated against normal human corneal epithelial cells (HCECs) whereas the in vitro genotoxicity was evaluated by the micronucleus (MN) assay in HCECs. The *Artemia salina* model was also applied for the evaluation of its in vivo toxicity.



## References

[1]: Meretoudi, A., Banti, C. N., Siifarika, P., Kalampounias, A. G., & Hadjikakou, S. K. (2020). Tetracycline Water Soluble Formulations with Enhanced Antimicrobial Activity. *Antibiotics* (Basel, Switzerland), 9(12), 845. <https://doi.org/10.3390/antibiotics9120845>.