SILVER(I)-ANTIBIOTIC-LOADED PHEMA CONTACT LENSES AS THERAPEUTIC HYDROGELS

Christina N. Banti and Sotiris K. Hadjikakou

Biological Inorganic Chemistry Laboratory, Department of Chemistry,
University of Ioannina, Ioannina, Greece
cbanti@uoi.gr, shadjika@uoi.gr

Ophthalmic drug delivery presents a significant challenge in the biological inorganic chemistry, since traditional methods are less efficient. The contact lenses have generated growing interest in ocular drug delivery due to their potential to enhance drug bioavailability in occular tissues. The manufacturing of next generation soft contact lenses involves the use of metalloantibiotics which control microbial colonisation. Silver(I) ions exhibit a broad spectrum of antimicrobial activity against both Gram-positive and negative bacteria. Therefore, the development of contact lenses combined with silver(I) is a research, technological and financial issue [1].

In the course of our studies on the development of new antimicrobial agents and therapeutic contact lens, the materials were synthesized by the dispersion in polymeric poly(2-hydroxyethyl methacrylate) (pHEMA) of silver(I) antibiotics (ciprofloxacin and penicillin). The materials were characterized by XRF, FT-IR-ATR and Uv-vis state spectroscopies. The materials were evaluated for their antibacterial activity against the Gram-negative species *P. aeruginosa* and Gram positive ones *S. epidermidis* and *S. aureus*. The *in vitro* and *in vivo* toxicity of the materials was tested against human corneal epithelial cells by micronucleus assay, *Artemia salina* and *Allium cepa* models.

Acknowledgements: The program “Supporting the Research Activities of the Laboratory of Biological Chemistry (MaRePBIC)” (University of Ioannina Research Committee program No 83718) is acknowledged.

The Research Project titled “Chiral metallodrugs as anticancer agents (24929)” is implementedunder H.F.R.I.’s action “3rd Call for H.F.R.I. Research Projects to Support Faculty Members andResearchers” (H.F.R.I. Project No.24929)

[1] C.N. Banti, S.K. Hadjikakou et.al., Dalton Trans., 2021, 50, 13712-1372