

PENICILLIN-G COMPLEXES OF Fe(II/III)

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Due to the presence of an efficient barrier against antibiotics, most infections caused by Gram-negative bacteria can be hard to treat. Overuse of broad-spectrum drugs can lead to the development of resistance strains and the loss of effectiveness. It can also trigger secondary bacterial infections and damage the gastrointestinal tract. Various strategies have been proposed to narrow the activity of antibiotics in clinical use. One of these is by targeting the nutrients (such as the iron, etc) that are transported into the microbes through the outer membrane.

Iron is also an important component for the diet of most bacterial species, and it is required for survival and colonization purposes of the host. To scavenge iron, many Gram-negative bacteria utilize siderophores. These metabolites are originally found in the cytoplasm, where they are biologically synthesized and then they are exported outside the cell so they can gather all the excess of iron on the surrounding space of the bacterial cell. Studies have proved that this mechanism of the bacteria can deliver toxic cargos for the bacteria themselves and lead to apoptosis.

In the course to our studies for the development of new more efficient antibiotics the reaction between Penicillin G (PENNa), with Iron(II/III) salts, the [(PEN)_xFe_y] complexes were prepared and characterized by spectroscopic techniques (NMR, IR etc) and X-Ray fluorescent analysis.

Acknowledgement: This work was carried out in fulfilment of the requirements for the Master thesis of Mr. M.T.P according to the curriculum of the International Graduate Program in "Biological Inorganic Chemistry", which operates at the University of Ioannina within the collaboration of the Departments of Chemistry of the Universities of Ioannina, Athens, Thessaloniki, Patras, Crete and the Department of Chemistry of the University of Cyprus (<http://bic.chem.uoi.gr/BIC-En/index-en.html>) under the supervision of Prof. S.K.H.