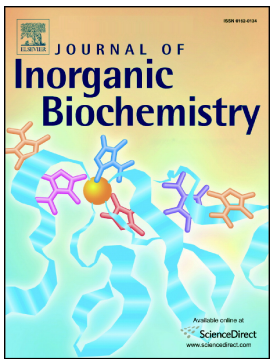

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Cu^{I} and Cu^{II} complexes with phosphine derivatives of fluoroquinolone antibiotics – a comparative study on the cytotoxic mode of action

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ABSTRACT

In this paper, we present a comparative study on the cytotoxic mode of action of copper(I) and copper(II) complexes with phosphine derivatives of fluoroquinolone antibiotics (ciprofloxacin **HCp** and norfloxacin **HNr**). The *in vitro* cytotoxic activity of four new compounds was tested against two selected cancer cell lines. All complexes exhibited much better cytotoxicity against both cell lines than unmodified fluoroquinolone antibiotics, their phosphines (**PCp**, **PNr**), chalcogenide derivatives (oxides: **OPCp**, **OPNr**; sulfides: **SPCp**, **SPNr** and selenides: **SePCp**, **SePNr**) and previously described by us complexes with phosphines derived from different fluoroquinolones: lomefloxacin (**HLm**) and sparfloxacin (**HSf**) as well as cisplatin. Apoptosis, observed at a great predominance, was induced by all studied complexes. Importantly, it was concluded that coordination compounds with Cu(I) ion (**[Cu^{I}-PNr]** and **[Cu^{I}-PCp])** were much more active than those with Cu(II) ion (**[OPNr-Cu^{II}]**, **[OPCp-Cu^{II}]**), even though the highest efficacy to produce reactive oxygen species, participating in overall cytotoxicity, was proved for copper(II) complexes among all studied compounds. Herein, we discuss not only results obtained for copper(I)/(II) complexes with phosphines derived from **HNr** and **HCp** but we also compare them to previously described data for **HLm** and **HSf** derivatives. This is the first insight into a structure-activity relationship of copper complexes with phosphine derivatives of fluoroquinolone antibiotics.

Keywords: copper complexes, fluoroquinolones, ROS production, apoptosis

1. Introduction