ABSTRACT

Charles University in Prague, Faculty of Pharmacy in Hradec Králové
Department of Analytical Chemistry
Candidate **Mgr. Jana Aufartová**
Supervisor **Prof. RNDr. Petr Solich, CSc.**
Title of Doctoral Thesis **DEVELOPMENT OF NEW METHODS FOR DETERMINATION OF SELECTED PHARMACEUTICALS IN ENVIRONMENTAL SAMPLES**

During last decade, the consumption of pharmaceuticals is increasing substantially. At the same time their occurrence in environment is increasing as well. Pharmaceuticals are released into environment by excretion, as conjugated or unchanged active compounds, as unused pharmaceuticals, which are not disposed according to the recommendations (e.g. thrown away into the rubbish or flushed down the toilet). Other possible sources of pharmaceuticals are in the agriculture, livestock and aquaculture. The current water treatment technologies do not remove all traces of pharmaceuticals in wastewaters. Therefore the monitoring of their occurrence in surface and wastewaters become more important.

Antibiotics and steroid hormones are a group of drugs used in human and veterinary medicine. The main problem with these groups of substances is the emergence of bacterial resistance, in the case of antibiotics, and the effect on the endocrine system, including the reproductive cycle, in the case of steroid hormones.

The theoretical part of the presented thesis is focused on the introduction dealing with the presence of antibiotics, steroid hormones and benzimidazole fungicides in the environment. Furthermore, there are several methods mentioned in this part used for the preparation of environmental samples such as solid phase extraction and other microextraction techniques. An important part of the presented work is an overview of methods used for the determination of steroid hormones and benzimidazole fungicides. These papers were published in international journals and as a book chapter (Chapter 5.2 and 5.3).

The practical part of this thesis is focused on the development of methods for determination of fluoroquinolone antibiotics in wastewater and its applications to samples of river water and wastewater. The newly developed sample preparation methodology and systematic development of analytical methods for fluoroquinolones was published in the international scientific journal (Chapter 5.1). Another scope of interest of the practical part of the thesis was a method development of sample preparation by microextraction techniques for steroid hormones from wastewater and sea water, followed by the determination using liquid chromatography with fluorescence and ultraviolet detection. This newly described methods were published or has been submitted in international scientific journals (Chapter 5.2).

All published papers are enclosed in a full version as supplements.