

Report on the doctoral thesis

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Author of work

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Name of the work

Development of new methods for determination of selected pharmaceuticals in environmental samples

The brief evaluation of the scientific value of the work

- The work brings the new knowledge
- The structure of the work and the methods correspond to the chosen objectives
- The results are clearly presented
- Discussion of the results and conclusions of the work are adequate
- A range of theoretical and experimental part of the work is balanced
- The overall scientific quality of the work is very good
- The work seems to be important for environmental analysis and environmental toxicology

Some comments to the scientific value of the work

- Some pharmaceutical substances can affect bacterial resistance and normal function of endocrine system in environmentally exposed persons. These environmental mixtures of substances (mainly aqueous) can represent very serious health problem to the future.
- In addition to the problems with individual biological effects of these substances we are faced with the problem of a combination of their biological effects in the mixtures.
- The concentrations of pharmaceuticals in environment (mainly aqueous) are often very low and the current state is characterized by the lack of sufficiently sensitive analytical methods. Described analytical research can markedly contribute to better understanding of behavior of discussed contaminants in aqueous environment (toxico-kinetic and toxico-dynamic mechanisms).
- It must be highly appreciated that chemometric principles were implemented into experimental design of study.
 - Question: Why were selected just “fluoroquinolone antibiotics” for the study?
 - Question: Please, briefly characterize (summarize) the strengths and weaknesses of different presented analytical methods in relation with analyzed substances. Do you think that described methods are suitable as well for other selected environmental

pollutants in water (with small modification)? If yes, for which groups of toxic environmental substances would be appropriate?

The brief evaluation of the formal side of the work

- The contribution of the author to the described research is obvious and clear (collection of experimental data, their processing and interpretation)
- Summary of the work (abstract) is sufficiently informative
- The work is written clearly and conspicuously
- Used citation I consider relevant in quantity and timeliness
- The scope of the work seems to be above-standard
- The overall quality of the formal side of the work is very good

Some comments to the formal part of the work

- Objective of the work is unnecessarily broad and partially follows the abstract
- Less confusion in numbering and referencing to the tables (Table 1/page 21, Table 1/page 22, Table 2/page 22, Table 2/page 24, missing Table 5, bad link to Table 5/page 26, etc.)

The publishing activity of the author in relationship with the work

Mgr. Jana Aufartová is the author (2x) and co-author (2x) of the papers published in international journals with recognized impact factor. Impact factor (IF) values are relatively high. I especially appreciate papers in *Analytica Chimica Acta* (IF = 4.3) and *Trends in Analytical Chemistry* (IF = 6.6). Interest in professional public on given research results is the best proof of the quality of the work. Jana Aufartová is also co-author of a chapter in the monograph and author of the paper which was sent to the journal *Chromatografia* (IF; paper is under review). The results of her work were presented on a number of international conferences (Poland, Sweden, Germany, Portugal, Italy and Serbia). At the 36th International Symposium on Environmental Chemistry she received Roland W. Frey Award, due to the best poster presentation. Publication and presentation activity are considered to be excellent.

Conclusion

The main goal of the work was to develop new methods for determination of selected groups of pharmaceutical compounds in the environmental water samples. The thesis was well planned, well-structured and the objectives were clear and concise. The results are innovative and provide an outstanding scientific contribution to an emerging area of science that deals with the evaluation of environmental contamination by pharmaceuticals and their disposal. The scientific papers were published in international journals of recognized impact and attest to the quality of the thesis. The theme of dissertation and its processing, as well as the presentation of the results in the scientific press confirm the competence of the author, Mgr. Jana Aufartová, for scientific work. Based on the above reported I am of opinion that this written document has got scientific merit for approval and discussion as a PhD thesis.

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