

Improvement of practice-orientation of organic chemistry for pharmaceutical students

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The traditional education is based mainly on mastery of content, neglecting the training of inquiring attitudes. Such system of education is teacher-centered, the students getting the information from a teacher about the known facts. In contrary, process-oriented, self-directed, creative and interdisciplinary learning which is referred to constructivist paradigms should be used in academic education. The inquiry technology is aimed on learning content as a means to develop problem-solving skills, students being the participants of the projects.

The academic process at medical Universities is traditionally practically oriented and includes only a few elements of scientific technologies. For pharmaceutical education this is often associated with the pharmacy assistant counter work; though pharmaceutical University educations includes much wider range of professional activities. We have improved the Organic Chemistry curriculum for pharmaceutical students in context of more practice-oriented teaching with the aid of modern educational technologies. We have modified the traditional modules (“Modern Synthesis in the preparation of pharmaceutical drugs”, “Small molecules in biological processes” etc.) and added the new module “Molecular modelling in rational drug design”. The new module consists of theoretical and practical parts. The latter includes lab classes where the students design structure and simulate molecular properties with the aid of ChemOffice application, followed by the molecular docking in online resources, e. g. [1]. The knowledge and skills obtained can be improved within the framework of Student research [2]. We propose students the projects concerning the search and primary investigation of biological activity of organic substances as potential pharmaceutical drugs, molecular docking being the key element of the research project. The research includes also the literary review and drug analysis (Journals, drug databases), the choice of the possible substrates (protein databases), the evaluation *in silico* the model based on a set of substances synthesized earlier and tested *in vitro* on biological activity, design of new drug-candidates and the assessment of their activity *in silico*. The results obtained are valid and correlated with the data from previous scientific researches, being presented in student conferences and, finally, published. Student research motivates students to study professionally oriented topics, trains their skill in the field of pharmaceutical chemistry and molecular biology, as well as helps the faculty to find the candidates for entering the Master and PhD programs.

References

[1] Docking Server [<http://www.dockingserver.com/web/>]

[2] T.T. Lakhvich. J. Baltic Sci. Education (2017) 16 (6): 832