O 33

Quantitative structure-activity relationship of pyrimidine and u racil derivatives for characterization and evaluation the potential of chemical compounds for cervical cancer

S. Zukic, U. Maran

Institute of Chemistry, University of Tartu, Ravila 14a, 50411 Tartu, Estonia

Cervical cancer is one of the leading causes of cancer-related deaths affecting women worldwide. Although many scientific efforts to prevent cervical cancer like HPV vaccine and prevention screening have been made, new drug substances for developed, recurrent and advanced cases are still in need. A pyrimidine is an important pharmacophore in many research studies for new drug substances. The significance of pyrimidines in the context of drug design is related to antiviral and anticancer activity. Uracil is pyrimidine nucleobase and component of ribonucleic acid (RNA). The aim of this study was to establish a QSAR model for pyrimidine and uracil compound families that have been studied for cervical cancer. Previous experimental evidence on antiproliferative activity in HeLa cell line, particulary of C-5 or C-6 substituted pyrimidine and uracil derivatives together with N-1 substitution and our experience in modelling of HeLa antiproliferative activity, motivated further investigation on potential anticancer activity of this class of compounds. Diverse datasets containing pyrimidine and uracil derivatives collected from ChEMBL database were curated for the study. Quantitative structure-activity relationship (QSAR) was derived from large set of 2D molecular descriptors calculated by PaDEL-Descriptors. A step-forward selection of molecular descriptors resulted in a model with 5 descriptors and good statistical quality (with $R^2 \sim 0.8$). The content of the model descriptors was analysed and discussed, and model was externally validated for further applications.

***Acknowledgement**:* Estonian research council (grant MOBJD1101)