CURRENT RESEARCH TOPICS IN PHARMACY:
In silico Approaches for Drug Design and Discovery

January 25th, 2023 13.00 PM
ISTANBUL

FOR REGISTRATION:

First Session- *Moderator: Esra TATAR 13.00-14.30 PM*

Welcome- Prof. Mesut SANCAR

In silico pharmakokinetics prediction of major coumarins present in *Aegle marmelos* L – Assist. Prof. Sneha Agrawal
Bharati Vidyapeeth's College of Pharmacy, Maharashtra, India

Pharmakokinetics evaluation with SimCYP program - Assoc.Prof.Enkelejda Goci
Aldent University, Tirana, Albania

A new approach in drug discovery: Network pharmacology - Dr. Yağmur Diker
Hacettepe University, Ankara, Turkey

Second Session- *Moderator: Esra TATAR 15.00-16.30 PM*

Computational identificaion of novel targets for drug candidate compounds - Assoc.Prof.Ceren Sucularlı
Hacettepe University, Ankara, Turkey

Designing novel mitochondrial fission inhibitors targeting Drp1-GTPase interaction using computational methods - Dr.Sefer Baday
Istanbul Technical University, Istanbul, Turkey

Artificial Intelligence: A member of drug discovery team – Assoc.Prof.Somaieh Soltani
Tabriz University of Medical Sciences, Tabriz, Iran

Discovery of novel Hepatitis C NS5B polymerase Inhibitors by in silico approaches - Dr. Berin Karaman Mayack
University of California Davis, Davis, USA

Chair
Prof. Hatice Kübra ELÇİOĞLU

Vice Chairs
Prof. Levent KABASAKAL & Assoc. Prof. Esra TATAR

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IN-SILICO PHARMACOKINETICS PREDICTION OF MAJOR COUMARINS PRESENT IN *AEGLE MARMELOS* L.

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Natural coumarins has enormous power as natural magical remedy for wide range of diseases, they are present in high concentrations in several dietary plant species like cinnamon, lemon, dill, soy oil, peanut oil, olive oil etc. In the larger category of nutraceuticals natural coumarins contribute for various activities, their pharmacotherapeutic aspects have been already published. A large amount of coumarin intake may have negative impact on health as the safety profile of coumarins was not thoroughly reviewed to present date [1-3]. The subtropical fruit *Aegle marmelos* L (A.M.) commonly known as Bael, a plant of Indian origin belongs to the Rutaceae family. Bael has been used as a medicine for diarrhea and dysentery treatment since 5000 B.C. [4]. Selective coumarins present in A.M. like umbelliferone, scopoletin, scoparone, xanthotoxol, marmesin, psoralen, imperatorin, alloimperatorin, and marmin [5-6] was taken for *in silico* ADME screening using SwissADME software [7]. In silico methods have the advantage that they can make fast predictions for a large set of compounds in a high-throughput mode. The earlier detection of PK/PD properties along with drug likeness and ADME profiling can save both money and time. It is also ensuring the safety and stability of the candidate-drugs or designed-drugs In Lipophilicity property, the rule says, "The larger the log P value greater the lipophilicity" [8]. XLOGP3 value of coumarins is in the range of -0.7 to + 5.0 size which indicates that they are lipophilic compounds, Log S (ESOL), Log S (ali), and Log S (SILICOS-IT) values of umbelliferone, scopoletin, scoparone, xanthotoxol, and marmesin shows good water solubility whereas psoralen, imperatorin, alloimperatorin, and marmin are moderately soluble in water [9]. According to pharmacokinetic properties, all other coumarins showed good GI absorption and penetration at BBB whereas marmin showed no penetration at BBB [10-13]. All coumarins showed no inhibition of the isoenzymes like CYP2D6, CYP3A4 as well as they are not good P-gp substrates which is clear indication of their low toxicity and no drug-drug interactions. The isoenzyme CYP1A2 found to be inhibited by all coumarins other than marmin whereas imperatoin, and alloimperatorin are inhibiting the isoenzymes like CYP2C19, CYP2C9 which leads to increase in bioavailability of drug. All selected coumarin were in the limit of Lipinski, Veber, and Egan filters which make them to have promising drug likeness properties. In

the BOILED egg model, all coumarins found in yellow regions (i.e., regions of high BBB absorption and high GI absorption) except marmin which is located on the boundary of white and yellow region that means it has good GI absorption, and no BBB permeation property. This data supports to conduct pre-clinical and clinical trials of bael fruit-based products such as squash, jelly, candy, etc. which will increase their value as food and nutraceutical products by a huge margin.

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