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Prediction of mechanism of some natural anti-cancerogen agents by using kinetic cell based morphological screening

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Drug discovery and development is both time and resource-intensive endeavor which is not always guaranteed to result in safe and efficacious drugs. The effective concentration of the compound and importantly the time needed for the compound to perturb the target varies from one compound to another. Taking into account those differences and limitations, we used a real time cell analyser that reveals the real time effects of the compounds over the impedance alterations on the e-plates. We tested extracts of some natural compounds such as *Salvia* species, *Chrisophthalmum* species, *Zizyphus* species etc., and some natural basic compounds such as gallic acid, ferulic acid, apigenin, luteolin, quercetin, curcumin etc. On several cell lines such as HepG2, A549, SHSY5Y, Colo 205 and Beta TC-6. The impedance profile and the time needed for the compound to interact with the cells varied from compound to compound and from cell to cell. We found that some natural compounds with similar biological activity produced similar impedance-based time-dependent cell response profiles (TCRP) as similar to results described over around 2000 chemical compounds before. Due to the kinetic nature of the profiling approach both short term and long term compound activity can be measured, allowing to guess the probable targets of the compounds on different cell lines. For instance, according to the results of this study the similar compounds showing their effects over DNA methylation, PPAR antagonism, cyclin dependent kinase inhibition, Ca channel inhibition, tubulin polymerisation, apoptosis or cytotoxicity have similar TCRPs with the real time cell analyser. In our study, we observed similar results with the natural compound extracts or basic natural compounds. These findings indicate that using impedance-based monitoring and profiling of cellular response upon exposure to biologically active compounds can provide incisive and quantitative information to novel mechanisms for these natural compounds.

Biography

Mukerrem Betul Yerer-Aycan is a pharmacist, physiologist and an Assoc.Prof. in the field of Pharmacology working in the Erciyes University, Faculty of Pharmacy, Dept. of Pharmacology, Turkey. She is the Chair of the Department since 2007 and the Vice-Dean of the Faculty since 2008. She has studied some parts of her PhD thesis in Spain in 2005 and did her post doc in Switzerland in 2007 and visited Colorado University, Denver, US for a while in 2011 to conduct a common research project. She has 14 papers in SCI and more than 15 national papers and more than 50 presentations in around 30 meetings. She has completed nearly 20 national or international projects from 2005 up to date. She has been awarded nationally or internationally 15 times for her several studies. She is the team leader of 2 MSc and 6 PhD students now and they are recently working on the anticancerogen effects of some natural products. She is in the editorial board of Current Pharmacogenomics and Personalized Medicine and she is an official member of 10 scientific societies. She says the biggest due of her career is 'she is the mother of two sons'.

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