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Editorial Open Access

A Pharmacovigilance Study on Linear and Non – Linear Quantitative Structure (Chromatographic) Retention Relationships (QSRR) Models for the Prediction of Retention Time of Anti – Cancer Nano Drugs under Synchrotron Radiations

A Heidari *

Faculty of Chemistry, California South University, 14731 Comet St. Irvine, CA 92604, USA

***Corresponding author:** A Heidari, Faculty of Chemistry, California South University (CSU), 14731 Comet St. Irvine, CA 92604, USA, Tel: +1-775-410-4974; E-mail: Scholar.Researcher.Scientist@gmail.com

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Editorial

Linear and non-linear Quantitative Structure (Chromatographic) Retention Relationships (QSRR) models for the prediction of retention time of anti-cancer Nano drugs under synchrotron radiations (Figures 1 and 2) were developed based on a diverse dataset with anti-cancer Nano drugs using Multiple Linear Regression (MLR) analysis and feed–forward Artificial Neural Networks (ANN) model [1–21]. Then, the suitable set of the molecular descriptors was calculated and the important descriptors were selected using stepwise regression method and synchrotron radiations. Stepwise Multiple Linear Regression (MLR) analysis and non–linear Artificial Neural Network (ANN) model were performed to build the models. The statistical and computational parameters by multiple linear model indicated satisfactory stability and predictive ability, while the predictive ability of Artificial Neural Networks (ANN) model is somewhat superior. Comparison the results of these two methods reveals that those obtained by the Artificial Neural Networks (ANN) model are much better under synchrotron radiations.

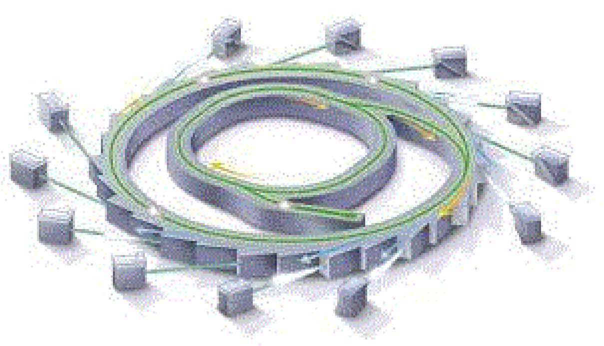

Figure 1: Schematic of linear Quantitative Structure (Chromatographic) Retention Relationships (QSRR) models for the prediction of retention time of anti–cancer Nano drugs under synchrotron radiations [1–21].

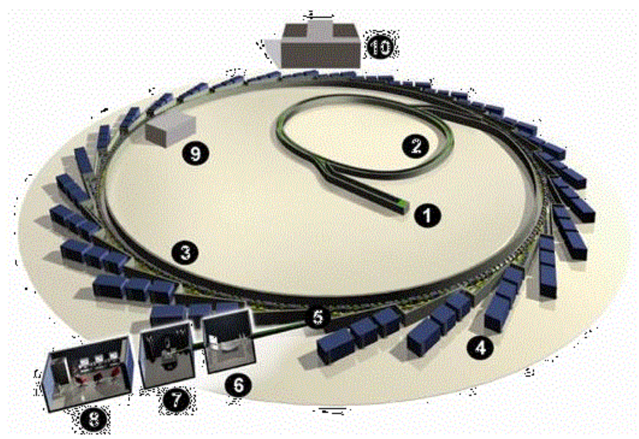

Figure 2: Schematic of non–linear Quantitative Structure (Chromatographic) Retention Relationships (QSRR) models for the prediction of retention time of anti–cancer Nano drugs under synchrotron radiations [1–21].

In this editorial, descriptors that appeared in the selected Multiple Linear Regression (MLR) analysis were used as inputs for the generated Artificial Neural Networks (ANN) model under synchrotron radiations. The stepwise Multiple Linear Regression (MLR) analysis led to the derivation of one model, with three variables and acceptable and reasonable statistical and computational parameters. Then, descriptors that appeared in the selected Multiple Linear Regression (MLR) analysis were used as inputs for the generated Artificial Neural Networks (ANN) model under synchrotron radiations. Artificial Neural Networks (ANN) model resulted in the generation of one model with acceptable and reasonable statistical and computational parameters for the training set and prediction set. After the comparison of the stepwise Multiple Linear Regression (MLR) analysis and Artificial Neural Networks (ANN) model under synchrotron radiations, it could be observed that the Artificial Neural Networks (ANN) model was superior to the Multiple Linear Regression (MLR) analysis under synchrotron radiations.

References

1. Li TJ, Huang CC, Ruan PW, Chuang KY, Huang KJ, et al. (2013) In vivo anti-cancer efficacy of magnetite nanocrystal - based system using

locoregional hyperthermia combined with 5-fluorouracil chemotherapy. Biomaterials 34: 7873-7883.

2. Maldonado CR, Salassa L, Gomez-Blanco N, Mareque-Rivas JC (2013) Nano-functionalization of metal complexes for molecular imaging and anticancer therapy. Coordination Chemistry Reviews 257: 2668-2688.
3. James LR, Xu ZQ, Sluyter R, Hawksworth EL, Kelso C, et al. (2015) An investigation into the interactions of gold nanoparticles and anti-arthritic drugs with macrophages, and their reactivity towards thioredoxin reductase. J Inorg Biochem 142: 28-38.
4. Das S, Carnicer-Lombarte A, Fawcett JW, Bora U (2016) Bio-inspired nano tools for neuroscience. Prog Neurobiol 142: 1-22.
5. Amitava R, Morikawa E, Bellamy H, Kumar C, Goettert J, et al. (2011) Status of the Centre for Advanced Microstructures and Devices (CAMD)-2010, Nuclear Instruments and Methods in Physics Research Section A: Accelerators 649: 15-18.
6. Tat J, Liu M, Wen XY (2013) Zebra fish cancer and metastasis models for in vivo drug discovery, Drug Discov Today Technol 10: e83-e89.
7. Wang L, Chen C (2016) Pathophysiologic mechanisms of biomedical nanomaterials. Toxicol Appl Pharmacol 299: 30-40.
8. Niececka D, Nawara K, Kijewska K, Nowicka AM, Mazur M, et al. (2013) Solid-core and hollow magnetic nanostructures: Synthesis, surface modifications and biological applications. Bioelectrochemistry 93: 2-14.
9. Caruso G, Merlo L, Caffo M (2014) 4 - Nanoparticles potential: types, mechanisms of action, actual in vitro and animal studies, recent patents, In Innovative Brain Tumor Therapy. Oxford 53-150.
10. Dynarowicz-Łątka P, Wnętrzak A, Broniatowski M, Flasiński M (2013) Miscibility and phase separation in mixed erucylphosphocholine–DPPC monolayers. Colloids Surf B Biointerfaces 107: 43-52.
11. Nilsson C, Barrios-Lopez B, Kallinen A, Laurinmäki P, Butcher SJ, et al. (2013) SPECT/CT imaging of radiolabeled cubosomes and hexosomes for potential theranostic applications. Biomaterials 34: 8491-8503.
12. Cupaioli FA, Zucca FA, Boraschi D, Zecca L (2014) Engineered nanoparticles. How brain friendly is this new guest?. Prog Neurobiol 119: 20-38.
13. Sainsbury F, Zeng B, Middelberg APJ (2014) Towards designer nanoemulsions for precision delivery of therapeutics. Current Opini Chemi Engine 4: 11-17.
14. Lian K, Leiros HK, Moe E (2015) MutT from the fish pathogen Aliivibrio salmonicida is a cold-active nucleotide-pool sanitization enzyme with unexpectedly high thermostability. FEBS Open Bio 5: 107-116.
15. Castangia I, Manca ML, Caddeo C, Bacchetta G, Pons R, et al. (2016) Santosomes as natural and efficient carriers for the improvement of phycocyanin reepithelising ability in vitro and in vivo. Eur J Pharm Biopharm 103: 149-158.
16. Davies GJ, Henrissat B (2013) Cracking the code, slowly: the state of carbohydrate-active enzymes in 2013. Current Opinion in Structural Biology 23: 649-651.
17. Vogiatzis CG, Zachariadis GA (2014) Tandem mass spectrometry in metallomics and the involving role of ICP-MS detection: a review. Anal Chim Acta 819: 1-14.
18. Chang G (2003) Retraction of Structure of MsbA from Vibrio cholera: A Multidrug Resistance ABC Transporter Homolog in a Closed Conformation. J Mol Biol 330: 419-430.
19. Kaiser J, Novotný K, Martin MZ, Hrdlicka A, Malina R, et al. (2012) Trace elemental analysis by laser-induced breakdown spectroscopy-Biological applications. Surface Science Reports 67: 233-243.
20. Drioli E, Curcio E, di Profio G (2005) State of the Art and Recent Progresses in Membrane Contactors. Chemi Engine Rese Des 83: 223-233.
21. Lecanda F, Warlow PM, Halstead LR, Steinberg TH, Civitelli R (1998) Impaired intramembranous bone formation in connexin43 null mice. Bone 23: S149-S653.