Gabriel Monteiro da Silva et al., J Proteomics Bioinform 2016, 9:11(Suppl)
http://dx.doi.org/10.4172/0974-276X.C1.092

Virtual screening of HPV's oncoprotein E6 and rational ligand design

Gabriel Monteiro da Silva, Elvira Tamarozzi and **Silvana Giuliatti**
University of São Paulo, Brazil

The viral oncoprotein E6 is related with the development of cervical cancer in HPV positive patients. E6 has been reported to bind to TNF-α, p53, p600 and p21, blocking the traditional pathways to apoptosis and leading to unregulated cell growth. This work aimed to use computational methods such as virtual screening (both target-based and ligand-based), molecular dynamics simulation, toxicity prediction and rational ligand design in order to search for potential inhibitors to human papillomavirus E6 oncoprotein. We also conducted a parallel study using other *in silico* methods such as binding site prediction and pharmacophore identification in order to thoroughly uncover the oncoprotein's properties. The most common European variants of E6 oncoproteins, previously modeled by Tamarozzi & Giuliatti (2015), were submitted to target-based virtual screening by using GOLD and Autodock Vina software and the molecules within the FDA-approved database as ligand pool. The highest scoring protein/ligand complexes were submitted to molecular dynamics simulation using GROMACS and then underwent visual analysis in both PyMOL and Chimera in order to evaluate their molecular interactions with the active site of E6. Finally, we performed theoretical toxicity predictions and pharmacokinetics simulations through a series of open-source web servers in order to select only the safest ligands which were used as pivot molecules for the rational design of hybrids novel molecules that combine the desired characteristics of the best ranked ligands, leading us to a considerable pool of potential inhibitors to oncoprotein E6.

Biography

Gabriel Monteiro da Silva is a Master's Student at University of São Paulo. Under the guidance of Professor Silvana Giuliatti, he presented an oral session about Virtual Screening at EUROGIN 2015 multidisciplinary congress and has extensive experience in "Deploying *in silico* methods aimed towards the inhibition of HPV's oncogenic viral proteins".

gabriel.monteiro233@gmail.com