Application of nanobioinformatics in drug design and delivery systems

Abbas Salavaty and **Mozhdeh Shahmoradi**
University of Kashan, Iran

Nanobioinformatics is a convergent field which integrates the science of nanotechnology with bioinformatics. Nanobioinformatics has the potential to solve problems regarding high throughput genomics data, novel biomarker discovery, complex biological systems, computer-aided drug design (CADD), and nanobiology. Also, nanobioinformatics can be used for devising and designing of different nanosystems. In this context, for instance, bioinformatics can efficiently facilitate identification of multiplexed probes in a nanoparticle. Nano drugs are capable of cell targeting, penetration, and controlled release. Today, the application of nanobiotechnology in drug delivery systems is well-known. Bioinformatics is an important predictive approach for designing nano-transport systems for specific drugs. Also, integration of the power of two chem/bioinformatic techniques, molecular dynamics (MD) and docking, with statistics can help prediction of the efficiency of drug loading in nanoparticles. In addition, in the context of in-silico drug design, nano-design through nanoscale simulation and modeling requires cheminformatic and bioinformatic techniques such as MD simulations, quantitative structure–activity relationship (QSAR), molecular mechanics and quantum mechanics. A growing number of publically available databases such as nanoparticle ontology and chemical entities of biological interest can be used to retrieve required data for nanobioinformatic drug design. Altogether, nanobioinformatics is a novel multidisciplinary field with many potential capabilities in drug design and delivery systems which may significantly accelerate the treatment many deadly diseases including cancer.

Speaker Biography

Abbas is a student currently living in Tehran, Iran. He completed his diploma in biology at the age of 18 years (2011) from Shahid Beheshti High School. Then, he obtained a B.Sc. degree in Genetics from the Shahid Chamran University of Ahvaz in spring 2015. Now, he is studying Masters of Biochemistry at the University of Kashan. His special research interests range from Bioinformatics to Drug Design focusing on melanoma and lung cancer. He is also interested in Epigenetics.

e: abbas.salavaty@gmail.com