MOLECULAR INTERACTION OBSERVED IN A REAL TIME WITH SPR BIOSENSOR

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Majority of experimental methods, used in biophysical or biochemical examination of molecular interactions, allow to receive end point results. It means, we usually measure a physical signal at a discrete time point. This approach gives us results comparable to that obtained for a single shot of a photo-camera. Much more information can be obtained with a camera recording sequence of shots, and the resulting movie is always much more informative than the single picture. In analogy to that, methods allowing real time observations are more informative than methods giving end point results. As an example we can compare the Real Time PCR method with a standard PCR.

Surface Plasmon Resonance (SPR) phenomenon gives us a rare opportunity to observe mass change on the surface of SPR biosensor. This technique does not involve any type of molecular labeling and is able to detect molecules as small as dipeptide. Moreover, this technique allows for a real time observation of molecular complex formation and dissociation, with easy estimation of k_a and k_d rates for variety of models of molecular interactions. As a ligand any biomolecule can be used. The standard method involves a ligand immobilization on the SPR sensor surface by a chemistry of $–NH_2$, –SH, –CHO, –OH or –COOH groups, and by a hydrophobic interaction. When SPR biosensors are employed in a micro-fluidic system, possible are several types of operation. For example, a ligand fishing of specific analyte from a mixture of biomoleculs is quite easy. Application of SPR biosensors is limited to biological objects with a size below 300 nm. Thus, this technique can not be used for whole cells observation.