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PRINCIPLES OF MODELING IN MOLECULAR BIOLOGY. APPLICATION FOR P53-MDM2 PROTEIN INTERACTION

Mathematical modeling of molecular processes in biological system can reveal interesting features about time evolution of various molecular species. The introduction referes to the principles of model construction in molecular biology, mainly the first step - building the kinetic scheme of all molecular interactions to be traced. Second step is creating the corresponding computer simulation program which can produce both qualitative and quantitative results. A reliable interpretation can be given only to the results obtained with trustful parameters describing the system. Such an example is be presented; it refers to the well known P53-MDM2 loop of protein-protein interaction, which has an oscillatory behavior. Both time evolution graphs and phase diagrams are discussed. A comparison between two activation functions (continuous versus step-wise) is finally presented.