AGGREGATION AT UNFOLDING OF THE NEAR-INFRARED FLUORESCENT PROTEIN iRFP713

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Here, we studied the unfolding — refolding processes of iRFP713, belonging to near-infrared fluorescent proteins (NIR FPs), widely used as genetically encoded optical probes for real times visualization of molecular processes from single cell to the whole organism. Our data are consistent with the dissociation of the protein dimer to monomers at early step of guanidine thiocyanate induced unfolding of iRFP713 in apo- (free of the chromophore) and holoform (bound with biliverdin). Pronounced aggregation of iRFP713 in the case of the use of guanidine thiocyanate arises from the coincidence of the concentration range of the denaturant, in which the intermediate state of the protein is populated, with the range of denaturant concentrations that is optimal for neutralizing the charge of the protein surface.

K e y w o r d s: bacterial phytochromes, optical probes, protein aggregation