INVESTIGATING MEMBRANE PROTEIN COMPLEX CONFORMATIONAL CHANGES BY SANS

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Small angle scattering is a powerful technique to obtain structural information on proteins in solution. Small Angle Neutron Scattering (SANS) offers the additional possibility of focussing on one component of a complex (*e.g.* deuterated protein), cancelling the other partners of the complex (*e.g.* hydrogenated proteins) by contrast matching their contribution with an appropriate D_2O % (at 45% D_2O). In the case of membrane proteins, an additional component needs to be considered, the bound detergent and the micelles. We have developed a new class of amphiphiles, fluorinated surfactants, which have the same contrast match point as hydrogenated proteins, allowing to investigate the conformational changes undergone by partners in a membrane protein complex. Within tailed bacteriophages, interaction of the receptor binding protein (RBP) with a membrane receptor of the cell triggers viral DNA ejection into the host cytoplasm. In the case of phage T5, the RBP pb5 binds to the receptor FhuA, an outer-membrane protein of *Escherichia coli*, leading to capsid opening and cell-wall perforation. We have used SANS to investigate the conformational changes induced in the FhuA-pb5 complex. The solution structure of FhuA agrees with its crystal structure; that of pb5 shows an elongated shape. Neither display significant conformational changes upon interaction. The mechanism of signal transduction within phage T5 thus appears different to that of phages binding cell wall saccharides for which structural information is available.