sequences encoding peptide ligands were then cloned into geneIII of M13 bacteriophage as fusion. These sequences were previously reported to elicit tranmucosal transport (TMT). The investigation of capacity of these phages for targeting into intestinal cells is under study. The phage platform generated in our work has the capability to be used in targeting a variety of genes and drugs into intestinal cells.

Keywords: Bacteriophage M13, Phage Display, Phagemid, GFP, Intestinal Cells.

Abstract No.93

Investigation of Mechano-Chemical Properties of Lambda Phage Genome Using Optical Tweezers

*Somayeh Zeinali Lathori**, *Nader Seyed Reihani*, *Saeed Emadi*

Institute for Advanced Studies in Basic Sciences(IASBS), Zanjan, IR
(E-mail: elhamzeinali@rocketmail.com)

In recent years, we have experienced a dramatic innovation in biochemical and structural biological methodologies, origins of which goes back to the introduction of a new field known as single molecule biochemistry and biophysics. One of the methods of single molecule studying is optical tweezers that has made possible important advances in obtaining detailed information about processes such as replication, transcription, and translation. Investigations on physical properties such as elasticity of macromolecules such as DNA in high forces, is one of its exceptional capabilities. In this paper, the physical properties of genomic Lambda phage DNA, is studied with the use of an optical tweezer instrumentation. First, λ-DNA (48000 bp and about 16 μm in length) was labeled with biotin at one end and with Digoxigenin (DIG) at the other end. Then, the labeled DNA was linked to streptavidin- and anti-DIG-coated polystyrene beads. Finally, the elastic property of the DNA was investigated by exerting physical force onto it with the use of optical tweezers. Our preliminary results show that DNA could be stretched up to exertion of 65pN.

Keywords: Single Molecule Study, Optical Tweezers, DNA Labeling Using Biotin And Digoxigenin, Physical Analysis Of Lambda Genome.

Abstract No.94

The Paradigm of Uncertain Role of Surface Hydrophobicity in Chaperone Activity of Alpha-Crytallins

*Sadaf Saba**, *Reza Yousefi*, *Mohadeseh Kashani*, *Sara Zafaranchi*

Protein Chemistry Laboratory (PCL), College of Sciences, Shiraz University, Shiraz, IR
(E-mail: sadaf.bio@gmail.com)

As a prominent member of small heat shock protein (sHsp) family and major structural protein of eye lens, alpha crystallin is a large polydisperse oligomer of αA and αB-subunits. This chaperone suppresses the aggregation of unfolded proteins which is critical for the maintenance of lens transparency. Although the mechanism of chaperone activity of alpha-crystallin is not fully understood, entropically driven hydrophobic contacts between their accessible hydrophobic surfaces and newly exposed hydrophobic sites of unfolding substrates is known as one of the major forces implicated in the mechanistic action of this chaperone. As reported before, quantity of exposed hydrophobic surface plays a critical function in performing strong chaperone ability by chaperones. However in the case of alpha-crystallin as shown before, chaperone ability and the extent of hydrophobic surface sometimes run in opposite directions. The relation between surface hydrophobicity of alpha-crystallin and its chaperone activity has not been fully explained in literatures so far. In the current study, alpha-crystallin was purified from bovine lens, using gel filtration chromatography and the protein was subjected to long term non-enzymatic glycation, under sterile condition. Both glycated and non-glycated samples were used for determining the relationship between chaperone activity and surface hydrophobicity using different spectroscopic instruments. According to the results of this study, we believe that surface hydrophobicity may play a dual function. Increase in hydrophobicity results in elevated chaperone activity until reaching a threshold quantity, favoring stronger interactions between alpha-crsytallin and partially unfolded target protein. Further increase in the surface hydrophobicity may affect the subunit exchange process and oligomerization state of alpha-crystallin subunits, leading to the significant reduction in its chaperone activity.

Keywords: Alpha-crystallin, Hydrophobicity, Chaperone activity, Dual function.
