**43f Thermodynamic Characterization of the Binding between Plasmodium Falciparum Msp-19 Ligand to Erythrocyte Receptor Band 3 Loop 5abc Using Biosensor Technology**

*lixiao Zeng, Xuerong Li, Athar H. Chishti, and Christos G. Takoudis*

Study of protein interactions is of fundamental importance in the field of biotechnology and therapeutics. Protein binding thermodynamics is based on the size, structure, and formational dynamics of their binding sites and offers additional information for simulating, predicting, and manipulating such interactions. Understanding of these interactions is likely to open new avenues for designing novel drug technologies.

In Plasmodium faciparum malaria, the interaction of MSP19 ligand with erythrocyte receptor band 3 loop 5ABC is currently under investigation. Band 3 is a crucial invasion receptor for malaria parasite entry in red blood cells. Using biosensor technology, the binding of recombinant MSP19 to erythrocyte band 3 loop 5ABC is described in terms of combined kinetic and thermodynamic properties. Rate and affinity constants were determined using a BIAcore biosensor. The interactions between defined protein segments were investigated at temperatures from 298 to 310K. The KD value was found to increase with temperature, mainly due to higher values for the dissociation rate constant. Higher temperature also decreases the binding capacity on the biosensor chip. Thermodynamic parameters such as changes in enthalpy and entropy was also evaluated from equilibrium data using van't Hoff's theory. Because BIAcore sensor measures direct binding between defined protein segments, other factors affecting the binding interaction were also screened. Overall, we provide evidence that the BIAcore sensors provide a useful approach to gain new insights for thermodynamic analysis of the rate constant.