Proteoliposomes containing membrane proteins from *Plasmodium falciparum* for nanobiotechnology approach.

**Cury, T.A.C.**¹; Colhone, M.C.¹; Fotoran, W.L.²; Wunderlich, G.²; Stabeli, R.G.³; Zucolotto, V.⁴; Filho, S.A.⁵ and Ciancaglini, P.¹

¹Depto. Química, FFCLRP-SP-Ribeirão Preto, SP; ²ICB-USP-São Paulo, SP; ³Fiocruz Rondônia, Porto Velho, RO; ⁴USP-São Carlos, SP; ⁵UFAM, Manaus, AM, Brazil.

**INTRODUCTION:** The integrated electronic biosensors systems are capable of detecting analytes via specific recognition based upon the interaction between protein and ligands or antigens and antibodies. In this case, total membrane proteins of *Plasmodium falciparum* are obtained and reconstituted into liposomes for construction and characterization of biosensors. **MATERIALS AND METHODS:** The merozoite surface protein (two strains) of *P. falciparum* was solubilized at 0.1, 0.5 and 1% SDS at 4° C or room temperature and was ultracentrifuged for 1 hour. The solubilized protein extract (EPS) was reconstituted in liposomes containing Dipalmitoylphosphatidylcholine (DPPC), Dipalmitoylphosphatidylserine (DPPS) and cholesterol by the co-solubilization method. Aliquots of all steps obtained were analyzed by SDS-PAGE and Western Blotting, and the amount of proteins was estimated [Colhone et al. (2009) J.Colloid.Interf.Sci.333:373-379]. **RESULTS AND DISCUSSION:** The proteins were solubilized with SDS (0.5%) resulting in 50% of solubilization. The percentage of incorporation of EPS in the proteoliposomes was 70% and the diameters about 180 nm for both strains. The electrophoretic profile of EPS and proteoliposomes showed a variety of proteins with similar distribution between the two samples, indicating an efficient incorporation of the parasite surface proteins. Western blotting analysis showed that these proteins have immunogenic activity. **CONCLUSION:** Our results indicate an effective incorporation of total proteins in the surface of the parasite in liposomes and these systems may be immobilized on the surface of interdigitated electrodes and used to detect antibodies anti-*Plasmodium*, as standardized for *Leishmania* [Perinoto et al. (2010) Analyt. Chem.82(23):9763-9768].

Key Words: proteoliposome, co-solubilization, biosensor.
Financial Support: CAPES, CNPq and FAPESP.