Aquitaine –Karnataka collaboration
Scientific Project for Pre-PhD student exchange

Scientific Proposal

Project Title	**Comparative interactome analysis during differentiation of *Leishmania donovani***	
Scientific domain	Cell and molecular biology.	
Summary (ca. 10 lines)	Systematic analysis of protein-protein interactions, also called interactome mapping, was proven to be valuable in identification of proteins and in turn pathways involved in cellular differentiation in various organisms. Comparative interactome analysis at different stages during cell differentiation could help in understanding the mechanistic insights of cell differentiation. Tandem Affinity Purification (TAP) followed by Mass spectrometry was a powerful tool for identifying *in-vivo* protein-protein interactions (1). The project involves comparative analysis of protein-protein interactions during cellular differentiation using protozoan parasite, *Leishmania donovani* as a model system. In *Leishmania,* we have previously reported that actin and actin interacting proteins were essential for various cellular activities including cell division, intracellular vesicular trafficking and flagellar biogenesis (2-4). Actin, being an important protein having both structural as well as signaling roles in dictating cell differentiation, analyzing actin interactome in both promastigote as well as amastigote stages of *leishmania* helps in identification of pathways involved in cell differentiation. The project aims at understanding the biology of differentiation in an important human pathogen, *leishmania donovani* and hence has significant clinical and pharmacological implications.	
Student profile wished	Biochemist with strong interest in cell and molecular biology.	
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Timing & duration for project (give approximate ranges)	5-6 months; Any time of the year
Representative References	1. Rigaut, G. et al., (1999). A generic protein purification method for protein complex characterization and proteome exploration. Nature Biotechnology, 17, 1030 – 1032. 2. Tammana T. V. S., Sahasrabuddhe A. A., Bajpai V. K., Gupta C. M. (2010). ADF/cofilin driven actin dynamics in early events of Leishmania cell division. Journal of Cell Science, 123(11), 1894-901. 3. Tammana T. V. S., Sahasrabuddhe A. A., Mitra K, Bajpai V. K., Gupta C. M. (2008). Actin-depolymerizing factor, ADF/cofilin, is essentially required in assembly of Leishmania flagellum Molecular Microbiology, 70(4), 837–852. 4. Sahasrabuddhe AA, Bajpai VK, Gupta CM. (2004). A novel form of actin in Leishmania: molecular characterisation, subcellular localisation and association with subpellicular microtubules. *Mol Biochem Parasitol*. 134(1):105-14.

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