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# THE HUCK INSTITUTES OF THE LIFE SCIENCES

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## Postdoctoral position in malaria mass spectrometry-based metabolomics

### Job Description:

The **laboratory of Prof. Manuel Llinás at the Pennsylvania State University** seeks outstanding post-doctoral researchers in the areas of metabolomics and metabolic biochemistry, specifically focusing on the malaria parasite *Plasmodium falciparum* and its interaction with the host red blood cell. The Llinás lab, in collaboration with Joshua Rabinowitz at Princeton, has paved the way forward for malaria metabolomics and is a recognized leader in this area. Candidates with strong track records of accomplishment in metabolomics or a biochemistry-related discipline are encouraged to apply. The post-doctoral researcher will be expected to lead their own independent research project, as well as contribute to collaborative research. **Prior metabolomics and mass spectrometry experience is desired.** Exceptional opportunities are available for highly motivated candidates with strong publication records, regardless of their specific area of expertise.

Applicants must have recently received their Ph.D. in biology, chemistry, or biochemistry. Rank and salary are dependent upon qualifications.

Applications should include a *curriculum vita* that includes a list of publications and a brief statement (2 pages) of research interests and goals. Please provide contact information for three references that can provide letters of recommendation. Materials should be sent to [manuel@psu.edu](mailto:manuel@psu.edu).

The laboratory of Dr. Manuel Llinás at the Pennsylvania State University is studying the malaria parasite *P. falciparum* using a variety of approaches to investigate parasite-derived metabolic processes, biochemistry and interactions. In particular, we are using mass spectrometry-based metabolomics approaches to characterize the following: 1) the genetic variation underlying metabolic differences in malaria parasites, 2) the effects of antimalarial drugs, 3) an in-depth probing of specific biochemical pathways, and 4) measuring metabolic flux through the Plasmodium metabolic network. The goal of this work is to establish the relative importance of metabolic pathways utilized by the parasite to ultimately design better therapeutics against this devastating global human pathogen. This work will also provide an invaluable public resource for interpreting metabolic data, identifying new drug targets, and generating testable hypothesis on the metabolic regulatory mechanism of *P. falciparum*. Our group has already developed the mass spectrometry methods capable of performing the global metabolite detection experiments proposed.

## Relevant publications:

- Lewis IA, Wacker M, Olszewski KL, Cobbold SA, Baska KS, Tan A, Ferdig MT, Llinás M. "Metabolic QTL Analysis Links Chloroquine Resistance in *Plasmodium falciparum* to Impaired Hemoglobin Catabolism." *PLoS Genet.* 2014 Jan;10(1):e1004085.
- Cobbold SA, Vaughan AM, Lewis IA, Painter HJ, Camargo N, Perlman DH, Fishbaugher M, Healer J, Cowman AF, Kappe SH, Llinás M. "Kinetic Flux Profiling Elucidates Two Independent Acetyl-CoA Biosynthetic Pathways in *Plasmodium falciparum*." (2013) *J Biol Chem.* 2013 Dec 20;288(51):36338-50. doi: 10.1074/jbc.M113.503557. Epub 2013 Oct 25.
- Olszewski KL, Llinás M. "Extraction of hydrophilic metabolites from *Plasmodium falciparum*-infected erythrocytes for metabolomic analysis." (2013) *Methods Mol Biol.*;923:259-66.
- Babbitt SE, Altenhofen L, Cobbold SA, Istvan ES, Fennell C, Doerig C, Llinás M, Goldberg DE. "Plasmodium falciparum responds to amino acid starvation by entering into a hibernatory state." (2012) *Proc Natl Acad Sci U S A* Nov 20;109(47) Epub 2012 Oct 29.
- Olszewski KL & Llinás M. "Central carbon metabolism of *Plasmodium* parasites." (2010) *Molecular and Biochemical Parasitology*, 175 (2): 95-103.
- Plata G, Hsiao T-L, Olszewski KL, Llinás M, Vitkup D. "Reconstruction and flux-balance analysis of the *Plasmodium falciparum* metabolic network." (2010) *Molecular Systems Biology*, 6: 408, Epub 2010 Sept 7.
- Kafsack BFC & Llinás M. "Eating at the Table of Another: Metabolomics of Host/Parasite Interactions." (2010) *Cell Host & Microbe*, 7 (2), pp. 90-99. PubMed PMID: 20159614
- Olszewski KL, Morrisey JM, Wilinski D, Burns JM, Vaidya AB, Rabinowitz JD, Llinás M. "Host-parasite Interactions Revealed by *Plasmodium falciparum* Metabolomics" (2009) *Cell Host & Microbe*, 5 (2), pp. 191-199.

For more information about the Llinás lab: <http://llinaslab.psu.edu>



**The Millennium Science Complex**