



ULCA-DOE INSTITUTE FOR GENOMIC AND PROTEOMICS
205 BOYER HALL, BOX 951570
LOS ANGELES, CA 90095-1570
(310) 825-1402, FAX (310) 206-3914
HUIYING@MBL.UCLA.EDU

December 15, 2005

Dr. Yves Brun
Systems Biology/Microbiology Faculty Search
Department of Biology
Indiana University
Jordan Hall 142, 1001 E 3rd St.
Bloomington, IN 47405-7005

Dear Dr. Brun,

Please consider my application in your search for faculty candidates in Systems biology/Microbiology at the assistant professor level in the Department of Biology and Biocomplexity Institute at Indiana University, Bloomington.

During my Ph.D. and postdoctoral training in the laboratory of Dr. David Eisenberg and in close collaboration with Dr. Robert Modlin at UCLA, I have studied protein functions and protein-protein interactions in the areas of bioinformatic analysis of genome sequences, structural biology using X-ray crystallography, and analysis of gene expression data from microbial infection diseases.

My research interest is the molecular mechanism of oncogenesis in relation to the immune response in pathogen-related cancers, in particular, gastric and colon cancers. To gain a detailed and systematic view of the formation and development of gastric and colon cancers, I plan to pursue research projects aiming at three levels: protein-protein interactions in host cells, host-pathogen interactions, and host-pathogen-flora interactions, using genomic, bioinformatic and metagenomic approaches. I plan to analyze gene expression data from cancer patients to identify aberrant signaling pathways and molecular markers for diagnosis and prognosis, and to develop computational tools to aid cancer detection, classification and outcome prediction of treatment. Simultaneous gene expression profiling of host and pathogen will be performed to study host-pathogen interactions. Computational analysis of the genome sequences and gene expression of the microbes in the gastrointestinal tract will be used to identify pathogenic genes and to study host-pathogen-flora interactions in relation to carcinogenesis.

My research group will combine computation and wet-lab experimentation to understand biological systems. I believe that I am able to tackle such projects with my multidisciplinary background in biochemistry, molecular biology, bioinformatics and structural biology and through collaborations with colleagues.

Through my research experience, I have learned the value of collaborations and I believe that many great advances come from the convergence of researches from different disciplines. It is my desire to

find a position where I can continue to help build collaborations and where I can share my research interests with colleagues. The Department of Biology and Biocomplexity Institute at Indiana University, Bloomington present an ideal environment for such a position. I sincerely hope to have the opportunity to meet you and your colleagues to learn more about your department and discuss how my research interests could be integrated at Indiana University, Bloomington.

Enclosed please find my C.V., copies of three papers, teaching statement, previous research summary and future research proposal. I have requested four letters of recommendation from Drs. David Eisenberg, Robert Modlin, F. Robert Tabita and Todd Yeates.

Sincerely,

A handwritten signature in black ink, appearing to read 'Huiying Li', with a stylized flourish extending to the right.

Huiying Li

HUIYING LI

UCLA-DOE Institute for Genomics and Proteomics
University of California, Los Angeles
205 Boyer Hall, Box 951570
Los Angeles, CA 90095-1570
Tel: (310) 825-1402
Fax: (310) 206-3914
E-mail: huiying@mbi.ucla.edu

EDUCATION

- Ph.D. Biochemistry and Molecular Biology, University of California, Los Angeles, 2004
Dissertation title: Using bioinformatic and X-ray crystallographic approaches to understand metabolism
Advisor: David Eisenberg
- M.S. Nutrition, University of California, Berkeley, 1999
- M.S. Biochemistry, Peking University, Beijing, China, 1997
- B.S. Biochemistry, Peking University, Beijing, China, 1994

EMPLOYMENT

Postdoctoral fellow, 8/2004-present. Advisor: David Eisenberg
UCLA-DOE Institute for Genomics and Proteomics, University of California, Los Angeles

RESEARCH INTEREST

My previous research falls into three main areas with the common theme of protein functions and protein-protein interactions: bioinformatic analysis of genome sequences, structural biology using X-ray crystallography, and statistical analysis of gene expression data.

My research interest is to elucidate the molecular mechanism of pathogen-related oncogenesis at three levels: protein-protein interactions, cell-cell interactions, and interactions between host and microorganisms in the community, using genomic, bioinformatic and metagenomic approaches. My career goal is to establish a research group that combines computation and wet-lab experimentation to understand biological processes, in particular, the role of immune response in the development of gastric and colon cancers.

RESEARCH EXPERIENCE

- 2004-present University of California, Los Angeles. Advisor: Prof. David Eisenberg
1. *Gene expression data analysis to understand the regulation of Toll-like receptors in innate immune response* (in collaboration with Dr. Robert L. Modlin at UCLA).
 2. *Genome sequence analysis of energy-producing bacterium *Rhodospseudomonas palustris* and of the microorganisms from the sea* (in collaboration with Dr. J. Craig Venter at the J. Craig Venter Institute).
- 1999-2004 University of California, Los Angeles. Advisor: Prof. David Eisenberg
1. *Detecting parallel pathways and complexes from genome sequences.*
 2. *Genome-wide protein functional linkage analysis.*

3. *Gene expression profiling to understand and discriminate clinical forms of leprosy* (in collaboration with Dr. Robert L. Modlin at UCLA).
4. *Structural and functional studies of RuBisCO-like protein by X-ray crystallography and bioinformatics* (in collaboration with Dr. F. Robert Tabita at the Ohio State University).
5. *Structure determination of eukaryotic glutamine synthetase by X-ray crystallography.*

- 1997-1999 University of California, Berkeley. Advisor: Prof. Sean Baker
Study of DNA mismatch repair genes in uterus sarcoma.
- 1994-1997 Peking University, Beijing, China. Advisor: Prof. Yuxian Zhu
Cloning and characterization of senescence-related genes in G2 pea using differential display PCR and representational difference analysis.
- 1993-1994 Peking University, Beijing, China. Advisor: Prof. Binggen Ru
Purification of alkaline phosphatase by affinity chromatography.
Expression and characterization of metallothionein in tumor cells.
- 1991 Peking University, Beijing, China. Advisor: Prof. Zhangliang Chen
Transgenic sweet pepper tissue culture.

TEACHING EXPERIENCE

- 1999-2000 University of California, Los Angeles
Teaching assistant, CHEM 153L, Biochemical Methods I
- 1999 University of California, Berkeley
Teaching assistant, NS 170, Experimental Nutrition Laboratory

ADDITIONAL TRAINING

- 2003 Making and Using DNA Microarrays, Cold Spring Harbor Laboratory
An eight-day hands-on course covering process of building a robot for printing DNA microarrays, preparing DNA samples and slides, printing DNA microarrays, designing and conducting microarray experiments, data analysis, display and interpretation.
Taught by Vishwanath Iyer and Jason Lieb at the Cold Spring Harbor Laboratory, NY.

AWARDS

- 2002 International Union of Crystallography Travel Award,
US National Committee for Crystallography and NASA
- 2000 Excellence in Teaching Award, University of California, Los Angeles
- 1996 GANGSONG Award, Peking University, Beijing, China
- 1993 TAICHANG Award, Peking University, Beijing, China

PROFESSIONAL MEMBERSHIPS

- Member of American Crystallographic Association
Member of Biophysical Society
Member of Protein Society

REVIEWS FOR SCIENTIFIC JOURNALS

Biochemistry

Journal of Molecular Biology (co-reviewed with Dr. David Eisenberg)

Protein Science (co-reviewed with Dr. David Eisenberg)

PUBLICATIONS

1. **Huiying Li**, Gaston M.U. Pfluegl, Ching-Hwa Kiang, Martin Phillips, Mari Gingery, David Eisenberg. Reexamination of the subunit structure of eukaryotic glutamine synthetase II reveals a tetradecameric organization. *Manuscript in preparation*.
2. Shibu Yooseph, ..., **Huiying Li**, et al., The global proteome: leveraging environmental survey data to build a more comprehensive view of protein space. *Manuscript in preparation*.
3. Philip T. Liu*, Steffen Stenger*, **Huiying Li**, Linda Wenzel, Belinda H. Tan, Jürgen Schaubert, Kent Wu, Christoph Meinken, Manfred Wagner, Robert Bals, Andreas Steinmeyer, Ulrich Zügel, Richard L. Gallo, David Eisenberg, Martin Hewison, Bruce W. Hollis, John S. Adams, Barry R. Bloom and Robert L. Modlin. Activation of human TLR2/1 triggers a vitamin D receptor-dependent antimicrobial response. Submitted to *Science*. (*equal contributions)
4. Belinda H. Tan, **Huiying Li**, David Eisenberg, Robert L. Modlin. Activation of TLRs induces IL-27 and its receptor. Submitted to *Journal of Immunology*.
5. Stephan R. Krutzik, Belinda Tan, **Huiying Li**, Maria-Teresa Ochoa, Philip T. Liu, Sarah E. Sharfstein, Thomas G. Graeber, Peter A. Sieling, Yong-Jun Liu, Thomas H. Rea, Barry R. Bloom, Robert L. Modlin. Activation of Toll-like receptors triggers the rapid differentiation of monocytes into macrophages and dendritic cells. *Nature Medicine*, 11(6):653-660 (2005).
6. **Huiying Li**, Michael R. Sawaya, F. Robert Tabita, David Eisenberg. Crystal structure of a RuBisCO-like protein from the green sulfur bacterium *Chlorobium tepidum*. *Structure*, 13:779-789 (2005).
7. **Huiying Li**, Matteo Pellegrini, David Eisenberg. Detection of parallel functional modules by comparative analysis of genome sequences. *Nature Biotechnology*, 23(2):253-260 (2005).
8. Joshua R. Bleharski*, **Huiying Li***, Christoph Meinken*, Thomas G. Graeber*, Maria-Teresa Ochoa, Masahiro Yamamura, Anne Burdick, Euzenir N. Sarno, Manfred Wagner, Martin Röllinghoff, Thomas H. Rea, Marco Colonna, Steffen Stenger, Barry R. Bloom, David Eisenberg, Robert L. Modlin. Use of genetic profiling in leprosy to discriminate clinical forms of the disease. *Science*, 301:1527-1530 (2003). (*equal contributions)
9. **Huiying Li**, Zhefeng Guo, Yuxian Zhu. Molecular cloning and analysis of a pea cDNA that is expressed in darkness and very rapidly induced by gibberellic acid. *Mol. Gen. Genet.*, 259(4):393-397 (1998).
10. Yuxian Zhu, Yifeng Zhang, **Huiying Li**. Molecular cloning of GA-suppressed G2 pea genes by cDNA RDA. *Science in China, Series C*, 40:379-383 (1997).

INVITED TALKS

1. Detection of parallel functional modules by comparative analysis of genome sequences. Proteome Informatics Workshop by the National Resource for Proteomics and Pathways, June 23-24, 2005, University of Michigan, Ann Arbor, Michigan, USA.
2. Using bioinformatics to detect parallel pathways in organisms. Twelfth International Conference on Microbial Genomes, September 26-30, 2004, Lake Arrowhead, California, USA.
3. Crystal structure of RuBisCO-like protein from *Chlorobium tepidum*. Gordon Research Conferences, Molecular Basis of Microbial One-Carbon Metabolism, August 1-6, 2004, Mount Holyoke College, Massachusetts, USA.

PRESENTATIONS AT SCIENTIFIC CONFERENCES

1. **Huiying Li**, Poh K. Teng, David Eisenberg. Protein complexes and pathways in *R. palustris* and *E. coli*. Presented at the 1st Integrated Center for Structure and Function Innovation Meeting, October 2-3, 2005, Los Alamos, New Mexico, USA.
2. **Huiying Li**, Michael R. Sawaya, F. Robert Tabita, David Eisenberg. Crystal structure of a novel RuBisCO-like protein from the green sulfur bacterium *Chlorobium tepidum*. Presented at the 17th West Coast Protein Crystallography Workshop, March 20-23, 2005, Pacific Grove, California, USA.
3. **Huiying Li**, David Eisenberg. What can we learn from comparing ACGTs? Computational analysis of protein functional linkages of the purple bug - *Rhodospseudomonas palustris*. The *Rhodospseudomonas palustris* DOE Genome to Life Project Meeting, July 15-16, 2004, University of California, Los Angeles, California, USA.
4. **Huiying Li**, Matteo Pellegrini, David Eisenberg. Detecting parallel pathways and complexes from genome sequences. Presented at the Keystone Symposia, Biological Discovery Using Diverse High-Throughput Data, March 30-April 4, 2004, Steamboat Springs, Colorado, USA.
5. **Huiying Li**, Matteo Pellegrini, David Eisenberg. Detecting parallel pathways and complexes from genome sequences. Presented at the Gordon Research Conferences, Structural, Functional and Evolutionary Genomics, February 15-20, 2004, Harbortown, California, USA.
6. **Huiying Li**, Joshua R. Bleharski, Thomas G. Graeber, David Eisenberg, Robert L. Modlin. Gene expression data analysis of leprosy patient samples: Prediction of the clinical course of disease and identification of genes that regulate the response to microbial pathogens. Presented at the 17th Symposium of the Protein Society, July 26-30, 2003, Boston, Massachusetts, USA. Published in *Protein Science*, 12(Suppl. 2): p127 (2003).
7. **Huiying Li**, Gaston M.U. Pfluegl, Ching-Hwa Kiang, Mari Gingery, David Eisenberg. Difficult phasing in solving the structure of eukaryotic glutamine synthetase II. Presented at the 16th West Coast Protein Crystallography Workshop, March 23-26, 2003, Pacific Grove, California, USA.
8. **Huiying Li**, Gaston M.U. Pfluegl, Ching-Hwa Kiang, Mari Gingery, David Eisenberg. Difficult phasing in solving the structure of eukaryotic glutamine synthetase II. Presented at the XIX Congress and General Assembly of the International Union of Crystallography, August 6-15, 2002, Geneva, Switzerland. Published in *Acta Cryst. A58* (Supplement), C77 (2002).
9. **Huiying Li**, Gaston M.U. Pfluegl, Mari Gingery, David Eisenberg. Preliminary structural studies of eukaryotic glutamine synthetase II. Presented at the 46th Biophysics Society

Meeting, February 23-27, 2002, San Francisco, California, USA. Published in *Biophysical Journal*, 82(1): p453a (2002).

10. **Huiying Li**, Gaston M.U. Pfluegl, David Eisenberg. Expression, purification and crystallization of alfalfa glutamine synthetase. Presented at the American Crystallographic Association 2001 Annual Meeting, July 21-26, 2001, Los Angeles, California, USA.
11. **Huiying Li**, David Eisenberg. Expression, purification and crystallization of alfalfa glutamine synthetase. Presented at the 15th West Coast Protein Crystallography Workshop, March 25-28, 2001, Pacific Grove, California, USA.

REFERENCES

1. **David Eisenberg** (Ph.D. and postdoctoral advisor), Professor, Howard Hughes Medical Institute, UCLA-DOE Institute for Genomics and Proteomics, Departments of Chemistry and Biochemistry and Biological Chemistry, University of California, Los Angeles, Box 951570, Los Angeles, CA 90095-1570. (310) 825-3754, david@mbi.ucla.edu.
2. **Robert Modlin**, Professor, Department of Microbiology and Immunology, Molecular Biology Institute, University of California, Los Angeles, Box 951570, Los Angeles, CA 90095-1570. (310) 825-6214, RModlin@mednet.ucla.edu.
3. **F. Robert Tabita**, Ohio Eminent Scholar and Professor, Department of Microbiology, the Ohio State University, 484 West 12th Avenue, Columbus, OH 43210-1292. (614) 292-4297, Tabita.1@osu.edu.
4. **Todd Yeates**, Professor, UCLA-DOE Institute for Genomics and Proteomics, Department of Chemistry and Biochemistry, University of California, Los Angeles, Box 951570, Los Angeles, CA 90095-1570. (310) 206-4866, yeates@mbi.ucla.edu.

RESEARCH FUNDING

NIH 2 R01 AI22553, Molecular analysis of host immune response in leprosy, 3/2004-3/2009, by the National Institute of Allergy and Infectious Diseases. Role: fellow, computational analysis. PI: Robert L. Modlin.