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*Banting & Best Department of Medical Research
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Education

- 09/2002-present Ph.D. candidate in Molecular Genetics
to defense University of Toronto, Toronto, Canada
in 12/2009 Thesis: Mapping SH3 domain interactomes
Supervisor: Professor Charles Boone
- 09/1998-10/2000 Graduate study in Biochemistry and Molecular Biology
Institute of Biophysics, Chinese Academy of Sciences, Beijing, China
Project: Exploration of the relationship of mitochondria and apoptosis
Supervisors: Professors Fuyu Yang & Jiachang Yue
- 09/1994-06/1998 B.Sc. in Biochemistry, minor in English
Yantai University, Yantai, China

Scholarship

- 2003 Open Fellowship, University of Toronto
- 2002 Connaught Scholarship, University of Toronto (prestigious entrance award)
- 1998-2000 Graduate Registration Scholarship, Chinese Academy of Sciences
- 1998 Excellent Undergraduate Thesis Award, Yantai University
- 1995-1997 Outstanding Undergraduate Student Fellowship, Yantai University (1st class award)
- 1996 Kong Fanxun Scholarship, Yantai University (highest award)
- 1995 Gong Peilan Scholarship, Yantai University

Research Experience

09/2002-present

Doctoral Candidate

Banting & Best Department of Medical Research, Department of Molecular Genetics, Terrence Donnelly Centre for Cellular and Biomolecular Research, University of Toronto

Ph.D. thesis: Mapping SH3 domain interactomes

Thesis Supervisor: Charles Boone (Professor, Banting & Best Department of Medical

Research, Department of Molecular Genetics, Terrence Donnelly Centre for Cellular and Biomolecular Research, University of Toronto)

- Generated a pair of yeast two-hybrid host strains and highly improved the screening sensitivity for large-scale protein-protein interaction network mapping
- Developed and validated the application of a novel smart-pooling method, Shifted Transversal Design (STD) pooling, in large-scale yeast two-hybrid screening
- Generated an extensive protein interaction network for budding yeast SH3 domains using yeast two-hybrid
- Developed the first metazoan SH3 domain interaction network for *C. elegans*, and discovered that the SH3 domain is functionally but not structurally conserved in endocytosis from yeast to metazoan

08-09/2006

Visiting Scientist

Center for Cancer Systems Biology, Dana-Farber Cancer Institute, Boston

Project: Yeast two-hybrid smart-pooling methodology development

Supervisors: Marc Vidal (Director, Center for Cancer Systems Biology, Dana-Farber Cancer Institute, Professor, Department of Cancer Biology, Professor of Genetics, Harvard Medical School) & Charles Boone

- Designed STD smart-pooling for ORFeome-size library
- Built STD pools for worm AD-ORFeome library

11/2005-03/2006

Visiting Scientist

Center for Cancer Systems Biology, Dana-Farber Cancer Institute, Boston

Project: Yeast two-hybrid system optimization

Supervisors: Marc Vidal & Charles Boone

- Validated the usage of a pair of yeast two-hybrid host strains in large-scale protein-protein interaction network mapping
- Optimize large-scale yeast two-hybrid screening protocols

01-07/2002

Research Assistant

Department of Biology, Graduate School of Chinese Academy of Sciences, Beijing, China

Project: Discovery of Fatty Acid Synthase (FAS) inhibitors from plant

Supervisor: Weixi Tian (Chair and Professor, Department of Biology, Graduate School of Chinese Academy of Sciences, Beijing, China)

- FAS inhibition study of natural products from certain Chinese herbs
- Quantitative structure-activity relationship study of certain compounds and their FAS inhibitory functions

10/2000-12/2001

Research Assistant

R&D Center, Institute of Biophysics, Chinese Academy of Sciences, China

Project: (1) Biological activity filtration of copper proteins from halobios

(2) Generation of monoclonal antibodies for human cardiac Troponin T&I

Supervisor: Qizhi Yao (Senior Scientist, R&D Center, Institute of Biophysics, Chinese Academy of Sciences, Professor, Department of Biology, Graduate School of Chinese Academy of Sciences, Beijing, China)

09/1998-10/2000

Graduate Project

Project: Exploration of the relationship between mitochondria and apoptosis

National Laboratory of Biomacromolecules, Institute of Biophysics, Chinese Academy of Sciences, China

Supervisors: Fuyu Yang & Jiachang Yue (Professors, Institute of Biophysics, Chinese Academy of Sciences, Beijing, China)

03-06/1998

B.Sc. Thesis

State Key Laboratory of Biochemistry Engineering, Institute of Process Engineering, Chinese Academy of Sciences, China

Thesis title: Mixotrophic cultures and carbon metabolism of *Anabaena sp.* PCC7120

Thesis Supervisor: Zhaoling Cai (Professor, Institute of Process Engineering, Chinese Academy of Sciences, Beijing, China)

01/1997-01/1998

Research Assistant

Department of Biochemistry, Yantai University, Yantai, China

Project: Vegetable plants tissue culture

Project Supervisor: Xianhua Xiao (Professor, Department of Biochemistry, Yantai University, Yantai, China)

Journal Publication

*Equal contribution.

In preparation or under review

1. **Xin X**, Tonikian R, Gfeller D, Lianet L, Pavlenco A, Zhang Y, Rual J-F, Tong H, Li J, Zhang Z, Hill DE, Grant BD, Vidal M, Bader GD, Sidhu SS, Boone C. Mapping SH3 interactomes reveals the conservation of their endocytosis role from yeast to worm, in preparation.
2. Li J*, Liu Y*, **Xin X***, Boone C, Wrana J and Zhang Z. Rewiring of miRNA regulatory network by positive selection during human population differentiation, in preparation.
3. Li J, Min R, Vizeacoumar FJ, Jin K, Xin X and Zhang Z. Topological constraints on expression noise in cellular networks of budding yeast, under review.

Published

4. Tonikian R*, **Xin X***, Toret CP*, Gfeller D, Landgraf C, Panni S, Paoluzi S, Castagnoli L, Currell B, Seshagiri S, Yu H, Winsor B, Vidal M, Davidson AR, Gerstein MB, Bader GD, Volkmer R, Cesareni G, Drubin DG, Kim PM, Sidhu SS, Boone C. (2009), Bayesian modeling of the yeast SH3 domain interactome predicts spatiotemporal dynamics of endocytosis proteins, *PLoS Biology*, 7(10): e1000218.

5. **Xin X***, Rual JF, Hirozane-Kishikawa T, Hill DE, Vidal M, Boone C, Thierry-Mieg N*. (2009) Shifted Transversal Design smart-pooling for high coverage interactome mapping, *Genome Research*, 19(7):1262-9.
6. Makhnevych T, Sydorskyy Y, **Xin X**, Srikumar T, Vizeacoumar F, Jeram S, Li Z, Bahr S, Andrews BJ, Boone C, Raught B. (2009) Global map of SUMO function revealed by protein-protein and genetic networks, *Molecular Cell*, 33:1–12.
7. Venkatesan K, Rual JF, Vazquez A, Stelzl U, Lemmens I, Hirozane-Kishikawa T, Hao T, Zenkner M, **Xin X**, Goh KI, Yildirim MA, Simonis N, Heinzmann K, Gebreab F, Sahalie JM, Cevik S, Simon C, de Smet AS, Dann E, Smolyar A, Vinayagam A, Yu H, Szeto D, Borick H, Dricot A, Klitgord N, Murray RR, Lin C, Lalowski M, Timm J, Rau K, Boone C, Braun P, Cusick ME, Roth FP, Hill DE, Tavernier J, Wanker EE, Barabási AL, Vidal M. (2009) An empirical framework for binary interactome mapping, *Nature Methods*, 6(1):83-90.
8. Tonikian R, Zhang Y, Sazinsky SL, Currell B, Yeh JH, Reva B, Held HA, Appleton BA, Evangelista M, Wu Y, **Xin X**, Chan AC, Seshagiri S, Lasky LA, Sander C, Boone C, Bader GD, Sidhu SS. (2008) A specificity map for the PDZ domain family, *PLoS Biology*, 6(9):e239.
9. Yu H, Braun P, Yildirim MA, Lemmens I, Venkatesan K, Sahalie J, Hirozane-Kishikawa T, Gebreab F, Li N, Simonis N, Hao T, Rual JF, Dricot A, Vazquez A, Murray RR, Simon C, Tardivo L, Tam S, Svrzikapa N, Fan C, de Smet AS, Motyl A, Hudson ME, Park J, **Xin X**, Cusick ME, Moore T, Boone C, Snyder M, Roth FP, Barabási AL, Tavernier J, Hill DE, Vidal M. (2008) High-quality binary protein interaction map of the yeast interactome Network, *Science*, 322(5898):104-10.
10. Wang W, Bouhours M, Gracheva EO, Liao EH, Xu K, Sengar AS, **Xin X**, Roder J, Boone C, Richmond JE, Zhen M, Egan SE. (2008) ITSN-1 controls vesicle recycling at the neuromuscular junction and functions in parallel with DAB-1, *Traffic*, 9(5):742-54.
11. Tong AH, Lesage G, Bader GD, Ding H, Xu H, **Xin X**, Young J, Berriz GF, Brost RL, Chang M, Chen Y, Cheng X, Chua G, Friesen H, Goldberg DS, Haynes J, Humphries C, He G, Hussein S, Ke L, Krogan N, Li Z, Levinson JN, Lu H, Ménard P, Munyana C, Parsons AB, Ryan O, Tonikian R, Roberts T, Sdicu AM, Shapiro J, Sheikh B, Suter B, Wong SL, Zhang LV, Zhu H, Burd CG, Munro S, Sander C, Rine J, Greenblatt J, Peter M, Bretscher A, Bell G, Roth FP, Brown GW, Andrews B, Bussey H, Boone C. (2004) Global mapping of the yeast genetic interaction network, *Science*, 303(5659):808-13.
12. Zhai D, Miao Q, **Xin X**, Yang F. (2001) Leakage and aggregation of phospholipid vesicles induced by the BH3-only Bcl-2 family member, BID. *European Journal of Biochemistry*, 268(1):48-55.
13. Yu G, **Xin X**, Cai Z, Shi D, Ouyang F (2000) Mixotrophic Cultures of *Anabaena sp.* *PCC7120*. *Engineering Chemistry and Metallurgy*, 21(1):52-57.

Book Chapter

1. **Xin X***, Thierry-Mieg N*, and Boone C. (2010). Mapping interactomes with high coverage and efficiency using the Shifted Transversal Design. In *Two-Hybrid Technologies: Methods and Protocols*, B. Suter, ed. (New York, Humana Press), in preparation.

Poster Presentation

1. **Xin X**, Thierry-Mieg N, Hill D, Vidal M, Boone C, Smart-pooling for proteome-scale interactome mapping using the Shifted Transversal Design, 2008 Yeast Genetics and Molecular Biology Meeting, Toronto
2. **Xin X**, Tonikian R, Vidal M, Boone C, *C. elegans* SH3 domain interactome, 2007 16th International *C. elegans* Meeting, Los Angeles
3. **Xin X**, Tonikian R, Vidal M, Boone C, *C. elegans* SH3 domain protein-protein interaction network,

2006 6th Annual ORFeome Meeting: ORFeomes and Systems, Boston

4. **Xin X**, Bader GD, Tong AH, Boone C, Yeast genetic interaction network is a small world network, 2004 Yeast Genetics and Molecular Biology Meeting, Seattle
5. **Xin X**, Bader GD, Tong AH, Boone C, Yeast SGA network is a scale-free network, 2004 Genetics Society of Canada Conference, Toronto

Lecture

1. Yeast genetic interaction network is a small world network, Informatics, Computational Biology and Networks Workshop in 2004 Yeast Genetics and Molecular Biology Meeting, Seattle

Membership in Professional Societies

- Genetics Society of America 2004-present

References

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Marc Vidal, Ph.D.

Director, Center for Cancer Systems Biology
Dana-Farber Cancer Institute
Professor, Department of Cancer Biology
Professor of Genetics
Harvard Medical School
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