

EDUCATION

- 10/15-Now Baylor College of Medicine, Duncan Neurological Research Institute, Houston, TX
Postdoctoral Associate, Advisor: Dr. Hugo Bellen
- 08/11-09/12 **Cornell University**, Weill Institute, Ithaca, NY
Postdoctoral Fellow Advisor: Dr. Scott Emr (Director of Weill Institute)
- 09/03-02/11 **University of Rochester**, Department of Biochemistry and Cell Biology, Rochester, NY
Ph.D. in Biochemistry. Advisor: Dr. Jeffrey Hayes (Department Chair)
- 09/01-09/03 **Jilin University**, Department of Life Science, Changchun, P.R.China
Pursued **M.S.** in Biochemistry. Advisor: Zhengqiang Li (Department Chair)
- 09/96-09/00 **Northeast Normal University**, Department of Biotechnology, Changchun, P.R.China
B.S. in Biotechnology with honor. **Earned professional Teaching Certification**

RESEARCH EXPERIENCE

- 08/11-09/12 **Postdoctoral Fellow**, Weill Institute, Cornell University, Ithaca, NY
Advisor: Dr. Scott Emr (Director of Weill Institute for Cell and Molecular Biology)
- Project: Molecular Architecture and Conformational Dynamics of ESCRT-III**
- ◆ Investigated the molecular mechanism of ESCRT-III complex assembly on endosomal surface during MVB vesicle formation by utilizing genetic and biochemical approaches
 - ◆ Visualized the assembly and the conformational changes of ESCRT-III subunits by transmission electron microscopy
- 09/03-02/11 **Graduate Student Researcher**, University of Rochester, Rochester, NY
Advisor: Dr. Jeffrey Hayes (Chair of Department of Biochemistry and Biophysics)
- Project 1: Mechanism of SWI/SNF and RSC Catalyzed Nucleosome Sliding**
- ◆ Developed a novel method to prepare a mono-nucleosomal substrate in which two H2A N-terminal tails were cross-linked in an intra-nucleosomal fashion, forming a closed loop that constrict separation of DNA from the histone surface
 - ◆ Characterized the mechanism of nucleosome remodeling by biochemical assays, our results indicated that the loops formed during remodeling are translocated around the histone octamer via a threading mechanism
- Project 2: Analysis of the Effect of Acetylation within the Histone H2B Tails Domains In Native Chromatin of *Tetrahymena Thermophila***
- ◆ Generated acetylation mimics by replacing H2B proteins with H2B mutants containing the specific cysteine substitutions in the N-terminal tail domain
 - ◆ The accessibilities of H2B mutants were determined by measuring the reaction rate of Fluorescein-5-Maleimide labeling

PUBLICATIONS

1. **Liu N**, Hayes JJ. When push comes to shove: SWI/SNF used a nucleosome to get ride of a nucleosome. *Molecular Cell*. 2010 May 28; 38(4): 484-6
2. **Liu N**, Balliano A, Hayes JJ. Mechanism(s) of SWI/SNF- Induced Nucleosome Mobilization. *Chembiochem*. 2011 Jan 24; 12(2): 196-204
3. **Liu N**, Peterson C, Hayes JJ. SWI/SNF-and RSC-catalyzed nucleosome mobilization requires internal DNA loop translocation within nucleosomes. *Molecular Cellular Biology*. 2011 Oct; 31(20): 4165-75
4. **Liu N**, Hayes JJ. Preparation of nucleosomes containing a specific H2A-H2A crosslink forming a DNA - constraining loop structure. *Methods in Molecular Biology*. 2012; 833: 351-71
5. **Liu N**, Wang Z, Hayes JJ. Acetylation of H2B is not essential in *Tetrahymena thermophila* and does not influence accessibility of H2B tail domain in native chromatin. [In preparation]

AWARDS AND HONORS

12/07	First Prize Award for the Presentation , 29 th International Asilomar Chromatin & Chromosomes Conference Title: ‘Probing the Mechanism of SWI/SNF Remodeling Using Intra-Nucleosome Crosslinking method’	Pacific Grove, California
10/07	Excellent poster in BMCB retreat, University of Rochester, 12 th Annual BCB Symposium at James P. Wilmot Cancer Center Title: ‘Probing the Mechanism of ySWI/SNF Remodeling Using Intra-Nucleosome Crosslinking method’	Rochester, NY
06/07	Excellent poster, Pennsylvania State University, 26 th Penn State Summer Symposium in Molecular Biology Title: ‘Mechanism of SWI/SNF catalyzed nucleosome remodeling’	Hershey, PA
06/00	Excellent Academic Scholarship for undergraduates	Changchun, P.R.China

LABORATORY SKILLS

- ♦ **Molecular Biology:** **Molecular cloning**, mutagenesis, isotope labeling, gel electrophoresis, PCR, real time PCR, DNA expression, extraction, DNA quality control and sequencing
- ♦ **Protein biochemistry:** protein purifications, western blot. *in vitro* reconstitution of chromatin, sucrose gradient centrifugation, FPLC, column chromatography, FPLC
- ♦ **Genetics manipulation of *Tetrahymena thermophila*:** strains culture, double knockout heterokaryons creation, transgenes generation by biolistic bombardment, fluorescence microscopy
- ♦ **Yeast system:** vector construction, gene expression analysis, genetic manipulation, and negative stain transmission electron microscopy
- ♦ **Biochemical assays:** cellular fractionation analysis, liposome sedimentation, liposome flotation, protein crosslinking, nucleosome sliding, DNA footprinting and **enzyme digestion assay**