

Jingzhou Hao

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EDUCATION

Rutgers University, New Brunswick, NJ

Bachelor of Arts, Biological Sciences (Transfer student)
Summa cum laude, graduated with highest departmental honors

Sep 2018--May 2020

University of California, Berkeley, CA

Extension Student in the Molecular and Cell Biology Department

Jan 2017--May 2018

East China Normal University (ECNU), Shanghai, China

Bachelor of Science, Biology (Transferred to Rutgers University)

Sep 2015--Jan 2017

WET LAB SKILLS

Skilled in

- Microbial cell culture preparation and growth
- DNA and RNA extraction
- qPCR & RT-PCR
- Transformation in *E.Coli*
- Nickel chelate chromatography (manually and FPLC)
- Heparin affinity chromatography (FPLC)
- Size-Exclusion chromatography (FPLC)
- Gel electrophoresis(Agarose gel and SDS-PAGE)

Experienced in

- Mouse dissection and tissue harvest
- Western blot
- MALDI-TOF mass spectrometry
- ELISA
- Immunofluorescence staining
- Steady state enzyme kinetics measurement

DRY LAB SKILLS

- **Programming Languages & Operating systems:** Linux, Python
- **NMR Spectroscopic Data Process & Analysis:** NMRpipe, Sparky
- **Protein Structure Calculation& Validation:** Cyana, ASDP, PSVS
- **Molecule Visualization:** Pymol, Chimera
- **Other Softwares:** MS office, Adobe Photoshop

RESEARCH EXPERIENCE

Immunology Laboratory (Rutgers University)

Jan 2020-May 2020

Student

Instructor: Dr. Ping Xie and Dr. Ewa Grudzien-Nogalska

- Dissected mouse and harvested thymus, spleen, bone marrow, liver and mesenteric lymph node;
- Analyzed the cell population in thymus and spleen by Immunofluorescence staining and flow cytometry;
- Analyzed CD4 expression in thymus, spleen, bone marrow, liver and mesenteric lymph node using RT-PCR.

Optimization of MLV Integrase CTD-Brd3 ET Structure using RDC (Residual Dipolar Coupling) NMR Experiment (Rutgers University)

May 2019-May 2020

Honor thesis

PI: Dr. Monica Roth

- Expressed and purified ¹⁵N labeled Brd3 ET domain and ¹⁵N labeled MLV Integrase CTD using Nickel chelate chromatography and size exclusion chromatography;
- Made the aligned protein sample by mixing ¹⁵N labeled protein with Pf1 phage;
- Run the IPAP experiment and optimized the 3D structure of MLV IN CTD-Brd3 ET complex.

Calibration of the Linear Curve between the Rotational Correlation Time(τ_c) and Molecular Weight for ^{15}N , ^1H -TRACT NMR Experiment

(Rutgers University)

May 2019-May 2020

Research Assistant PI: Dr. Gaetano T. Montelione

- Expressed and purified 16 different ^{15}N labeled proteins (MW range in 10kDa~40kDa) using Nickel chelate chromatography and size exclusion chromatography;
- Evaluated the purity of the ^{15}N labeled proteins by SDS-PAGE and MALDI-TOF mass spectrometry;
- Performed ^{15}N , ^1H -TRACT NMR experiments to determine the rotational correlation time (τ_c) of each protein;
- Plotted MW vs τ_c of the proteins and calibrated the linear curve between τ_c and protein MW.

Conformational Dynamics within MLV Integrase and Host Bromodomain-Containing Protein 3 (Brd3) Complex

(Rutgers University)

Sep 2018-May 2019

Research Assistant PI: Dr. Gaetano T. Montelione

- Purified ^{15}N labeled MLV Integrase(IN) C terminal domain(CTD) using Nickel chelate chromatography and size exclusion chromatography;
- Performed ^{15}N Nuclear Relaxation experiment and ^{15}N - ^1H Heteronuclear NOE experiment to ^{15}N labeled MLV IN CTD-Brd3 ET complex;
- Calculated the rotational correlation time (τ_c) and signal intensity ratio ($I_{\text{saturated}}/I_{\text{equilibrium}}$) for each residue;
- Proved that MLV IN CTD has a linker region which has limited flexibility.

General Biochemistry and Molecular Biology Laboratory

(UC Berkeley)

Jan 2017-May 2017

Student Instructor: Dr. Jacob Corn

- Made truncated *CIN8* mutants and GFP-fusion *CIN8* mutants of *S. Cerevisiae* and *C. Thermophilium* to study the functions of the coiled-coil domain in the ATP-dependent microtubule motor Cin8p;
- Observed the in-vivo co-localization of GFP-fused Cin8p and m-cherry labeled microtubules in *S. Cerevisiae*;
- Expressed and purified the truncated and wildtype Cin8p in *E. coli* using Nickel chelate chromatography;
- Did phenotypic analysis of truncated and wildtype Cin8p using complementation assay;
- Tested in-vitro ATPase activity of wildtype Cin8p and truncated Cin8p using Malachite Green Assay;
- Concluded that the coiled-coil domain of Cin8p is critical for the microtubule binding process in yeast.

Antibody Screening to FGF-21, KGF-2, uhrf1 and cdk9

(East China Normal University)

Sep 2016-Jan 2017

Apprentice PI: Dr. Min Qian

- Used M13 phage display random peptide library to screen the high-affinity antibodies for FGF-21, KGF-2, uhrf1 and cdk9;
- Repeated "binding, eluting, amplification" to enrich the phages which carried the high-affinity antibody;
- Performed Nickel chelate chromatography to purify the antibody;
- Measured the antibody affinity by calculating K_d of the antibody-antigen interaction;
- Did the determination of binding and linearity of ELISA signal;
- Sequenced the antibody genes which were carried by the enriched phages and got the scFv antibody.

Human Antibody Screening for CAR-T Therapy

(East China Normal University)

Jan 2016-Aug 2016

Apprentice PI: Dr. Min Qian

- Used M13 phage display random peptide library to screen the high-affinity scFv antibody for CAR-T therapy;
- Repeated "binding, eluting, amplification" to enrich the phages which carried the high-affinity antibodies;
- Practiced ELISA to quantify the antibody;
- Sequenced the high affinity antibody gene which can be used to produce CAR-T cell.

PUBLICATIONS

- Aiyer, S., Swapna, G. V. T., Ma, L.-C., Liu, G., **Hao, J.**, & Jacobs, B. C. (2019). "Characterizing the interface between Brd3 ET domain and MLV integrase C - terminal domain 2 using solution NMR spectroscopy." (In

Preparation)

HONORS AND AWARDS

- Member of Phi Beta Kappa National Honor Society (Rutgers) **May 2020**
- 2020 Paul Robeson Scholar (Rutgers) **May 2020**
- Highest Departmental Honors in Biology (Rutgers) **May 2020**
- Jerome & Lorraine Aresty Undergraduate Research Scholarship (Rutgers) **Nov 2019**
- Outstanding Student Scholarship (ECNU) **Nov 2017**
- Elite Class Special Scholarship (ECNU) **Nov 2017**
- Outstanding Student Scholarship (ECNU) **Nov 2016**
- Elite Class Special Scholarship (ECNU) **Nov 2016**

CONFERENCE PRESENTATIONS

- Poster Presentation---CABM SURE Program (Rutgers) **Aug 2019**
- Poster Presentation---CABM Retreat (Rutgers) **May 2019**

VOLUNTEER EXPERIENCE

- Cleaning trash in the Seashore (Berkeley) **Nov 2017**
- Guide in the University Bird Specimen Museum (ECNU) **Oct 2016**

REFERENCES

Dr. Gaetano T. Montelione

Constellation Chair in Structural Bioinformatics
Professor of Chemistry and Chemical Biology
Rensselaer Polytechnic Institute
Email: monteg3@rpi.edu
Relationship: co-author and thesis committee member

Dr. Monica Roth

Professor in Department of Pharmacology
Rutgers University-New Brunswick
Email: roth@rwjms.rutgers.edu
Relationship: co-author, thesis committee member and honor thesis advisor

Dr. James Aramini

Director of Biomolecular Nuclear Magnetic Resonance (NMR) Facility
Research Associate Professor in ASRC Structural Biology Initiative
City University of New York
Email: jaramini@gc.cuny.edu
Relationship: co-author and experimental collaborator

Dr. Anne Carr-Schmid

Professor of Cell and Developmental Biology
Rutgers University-New Brunswick
Email: schmid@biology.rutgers.edu
Relationship: thesis committee member and academic advisor