



# Molecular and Cell Biology Resources Core

## **Mission:**

Link between different biomedical sciences and technologies to support researches performed by PUI investigators.

- **Unites** highly organized, centralized services and equipment facilities located at LSU-BR or others to support the PUI researches.
- **Provides** technical and logistical support for the exchange of information, ideas, technology, and research capabilities among PUI investigators.
- **Ensures** that PUI researchers have full access to state-of-the-art equipment and modern research techniques and services, consultation, and training.



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## Sources:

### LSU-BR

- School of Veterinary Medicine
- Division of Biotechnology and Molecular Medicine (BioMMED)
- Shared Instrument Facility (SIF)
- Center for Computation & Technology (CCT)
- Center for Advanced Microstructures & Devices (CAMD)

### Core Laboratories

- LSU-BR, SVM:
  - a. Center for Experimental Infectious Disease Research COBRE
  - b. Center for Lung Biology and Disease COBRE
  - c. Center for Environmentally Persistent Free Radicals - NIEHS Super Fund
- Pennington BIOMED: Metabolic Basis of Disease Center COBRE
- LSU HSC-S: Redox Biology COBRE
- LSU HSC-NO: Mentoring in Cardiovascular Biology COBRE



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## **LSU-BR Immediately Accessible Facilities:**

- GeneLab (BioMMED/MCBRC)
- Protein Production, Purification, and Characterization Laboratory (BioMMED/MCBRC)
- Molecular Immunopathology Laboratory (BioMMED)
- Structural Biology Laboratory (MCBRC)
- Statistical Services Unit (SVM)
- Office of Laboratory Animal Welfare (SVM)
  
- LSU - Shared Instrument Facility (<https://www.lsu.edu/sif>)
  - a. LSU EM and cryo-EM Facility
  - b. LSU NMR facility
  - c. LSU MS facility
  - d. LSU Genomics facility



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## Services provided :

### **DNA:**

- DNA recombination
- Conventional and Next Generation Sequencing
- ChIP DNA prep and sequencing
- Epi-genetic DNA sequencing and analysis
- qPCR analysis
- $\mu$ RNA preparation and sequencing
- Invitrogen and ThermoFisher freezer programs

### **Protein, peptide, and Ab:**

- Construction and engineering of expression vectors
- Expression and purification of proteins
- Synthesis and purification of peptides and covalently modified peptides
- Preparation and purification of polyAb or monoAb

## **Protein chemistry and cell biology:**

- Surface Plasmon Refractometry
- Protein and small molecule Mass Spectrometry
- Flow cytometry
- Immunostaining and fluorescence microscopy
- Metabolic profiling (LSU HSC)
- Metabolomics (Pennington/LSU HSC)
- Proteomics (LSU HSC)
- Facilities for Biosafety Level 3 Experiments
- Experimental mice

## **Structural biology:**

- Large scale protein production and purification
- Crystallization screening and optimization
- Diffraction data collection and structure determination (APS/CAMD)
- Structure-based drug design
  - a. Virtual Screening
  - b. Small-size HTS
  - c. Lead optimization and Structure Activity Relationship study
- Protein and small molecule NMR (LSU-NMR)



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## **New development in structural biology:**

- High power cryo-EM (Krios), the technology for high-resolution structures of multi-protein complexes and virus particles without crystallization.
- Efforts to establish a LA hub for accesses to a few Krios facilities.
- The Pacific Northwest Cryo-EM Center (<https://pncc.labworks.org>), one of three NIH funded cryo-EM facilities.
- A grant for the on-site expert level training is in preparation.



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## New additions:

### **Statistical Services Unit (SVM)**

- Set up strategies for data collection
- Statistical analysis to keep high standards of scientific rigor
- Dr. Xue Wen hired.

### **Scientific writing**

- Writing helps in preparation of manuscripts and grant proposals.
- Critical reviews of manuscripts for papers

### **Bioinformatics and Data Storage (CCT)**

- Bioinformatic data mining
- Storage of raw data



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## **For full access and most efficient utilizations**

- Stay up-to a week or more for data collection/analysis and training
- Consultation for research strategies and protocols
- Expert inputs in manuscripts and grant proposals
- Workshops for high-use or new technology
- For minimization of delays, 'Core bucks' available.

**Any question?**

**Call or E-mail to Yong Lee**

E-mail: [yhlee@lsu.edu](mailto:yhlee@lsu.edu)

Office: 225-578-0522

Lab: 225-578-5221