Lihe Liu — Nov. 2024

Contact Information

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Research Interests

My academic pursuits are centered in the realm of computational biology and bioinformatics. With a background in Animal Sciences, my PhD work has involved using omics techniques to assess the impact of environmental factors on the bovine epigenome and transcriptome. In my latest endeavor, I have been exploring AI/ML application computational pathology and precision medicine.

Education

University of Wisconsin-Madison, Madison, Wisconsin USA

Ph.D., Animal Sciences (Computational Biology track), 09/2018 - 12/2023

- Dissertation: Revealing the Impact of Environmental Perturbations on the Bovine Epigenome

University of Wisconsin-Madison, Madison, Wisconsin USA

M.S., Computer Sciences, 09/2021 - 05/2023

Huazhong Agricultural University, Wuhan, P.R. China

B.S., Animal Sciences, 09/2014 - 07/2018

Professional Positions

Cancer Molecular Therapeutics Program
Sanford Burnham Prebys Medical Discovery Institute, La Jolla, California USA

- Postdoctoral Computational Biologist **01/2024 - Present**

Department of Animal and Dairy Sciences
University of Wisconsin-Madison, Madison, Wisconsin USA

- Graduate Research Assistant **09/2018 - 12/2023**

Draft Manuscripts

2024

5. M Choudhury*, **L Liu***, A Yadav, O Chapman, Z Ahmadi, R Younis, C Sharma, N Goel, S Sridhar, R Kenkre, A Dutta, S Wang, E Shulman, SR Dhruba, D Hoang, M Paul, D Malicki, K Yip, E Ruppin, L Chavez, S Sinha (2024) ***ecPath: Predicting ecDNA status in Tumors from Histopathology Slide Images*** (bioRxiv; codes)
4. **L Liu** & F Peñagaricano (2024) ***EnrichKit: A Multi-Omics Tool for Livestock Research.*** (bioRxiv; codes)
3. **L Liu**, J Laporta, F Peñagaricano (2024) ***Dry period heat stress alters the mammary gland transcriptome in the subsequent lactation of dairy cows.*** (Drafted)
2. S Sinha; N Sinha; M P. Garcia; A V. Tarrab; T Nyugen; **L Liu**; T Cantore; S Patiyal; S Mukherjee; S Madan; K Tharp; J Zhao; G Flanigan; D Meerzaman; U Ben-David; A J. Deshpande; E Ruppin (2024) ***DeepTarget Predicts Primary and Secondary Targets of Cancer Drugs by integrating large-scale genetic and drug screens.*** (Under review - Nature Cancer)
1. J Laporta, B Dado-Senn, A Guadagnin, **L Liu**, F Peñagaricano (2024) ***Pre-weaning heat stress alters liver transcriptome and DNA methylation in dairy calves*** (Under review - Journal of Dairy Science)

Peer Reviewed Journal Articles

2024

9. A Gonella-Diaza, M Sponchiado, M França, **L Liu**, G Pugliesi, E Turco, F Peñagaricano, M Binelli (2024) ***The metabolomic composition of the oviductal fluid is controlled by the periovulatory hormonal context in Bos indicus cows.*** *Biology of Reproduction*. ioae153. doi: 10.1093/biolre/ioae153

2023

8. R Amorín*, **L Liu***, P Moriel, N DiLorenzo, PA Lancaster, F Peñagaricano (2023) ***Maternal diet induces persistent DNA methylation changes in the muscle of beef calves.*** *Scientific Reports*. 13, 1587. doi: 10.1038/s41598-023-28896-3

2022

7. CM Sheftel, **L Liu**, SL Field, SR Weaver, CM Vezina, F Peñagaricano and LL Hernandez(2022) ***Impact of Fluoxetine Treatment and Folic Acid Supplementation on the Mammary Gland Transcriptome During Peak Lactation.*** *Frontiers in Pharmacology*. 13:828735. doi: 10.3389/fphar.2022.828735

2021

6. **L Liu**, R Amorín, P Moriel, N DiLorenzo, PA Lancaster, F Peñagaricano (2021) ***Maternal methionine supplementation during gestation alters alternative splicing and DNA methylation in bovine skeletal muscle.*** *BMC Genomics*. 22, 780. doi: 10.1186/s12864-021-08065-4

5. MA Mezera, W Li, **L Liu**, R Meidan, F Peñagaricano, MC Wiltbank (2021) ***Effect of natural pre-luteolytic prostaglandin F2α pulses on the bovine luteal transcriptome during spontaneous luteal regression.*** *Biology of Reproduction* . 105 (4), 1016-1029. doi: 10.1093/biolre/ioab123

4. SL Field, MG Marrero, **L Liu**, F Peñagaricano, J Laporta (2021) ***Histological and transcriptomic analysis of adipose and muscle of dairy calves supplemented with 5-hydroxytryptophan.*** *Scientific Reports*. 11.1: 1-10. doi: 10.1038/s41598-021-88443-w

2020

3. **L Liu**, R Amorín, P Moriel, N DiLorenzo, PA Lancaster, F Peñagaricano (2020) ***Differential network analysis of bovine muscle reveals changes in gene coexpression patterns in response to changes in maternal nutrition.*** *BMC genomics*. 21.1: 1-12. doi: 10.1186/s12864-020-07068-x

2. H Louvandini, PS Corrêa, R Amorín, **L Liu**, EH Ieda, CR Jimenez, SM Tsai, CM McManus, F Peñagaricano (2020) ***Gestational and lactational exposure to gossypol alters the testis transcriptome.*** *BMC genomics*. 21(1), 1-11. doi: 10.1186/s12864-020-6487-2

1. A Sigdel, **L Liu**, R Abdollahi-Arpanahi, I Aguilar, F Peñagaricano (2020) ***Genetic dissection of reproductive performance of dairy cows under heat stress.*** *Animal Genetics*. 51(4), 511-520. doi: 10.1111/age.12943

Technical Skills

Bioinformatics & Data Analysis	• (sc)RNA-seq, WGB-Seq, Bioconductor, PyTorch, scikit-learn
Programming Languages	• Python, R, Java, Shell (Bash), SQL (MySQL), C++, JavaScript/HTML/CSS, MATLAB
Framework	• Django, Spring Boot, ReactJS, NodeJS, JUnit, CUDA, OpenMP
Developer Tool	• Git, Conda, Docker, Nextflow, Slurm, GCP, AWS (EC2, RDS, S3)

Editorial Activities

Ad Hoc Reviewer

- Number of articles reviewed in total: **29** (not counting revisions) / **34** (counting revisions):
  BMC Genomics (1), Frontiers in Genetics (1), Gene(2), Epigenomes (1), International Journal of Molecular Sciences(2), Cancers (3), Genome (1), Genes (5), Biology (4), Animal Genetics (2), Animal Gene (1), Animals (4), Gene Reprots(1), Contrast Media Molecular Imaging (1)

Software Development

- ecPath: Predicting ecDNA status in Tumors from Histopathology Slide Images.
- EnrichKit: a toolkit for omics data analysis in animal species. (Web/Python/R)

Honors/Awards

2022 • ***Neal A. Jorgensen* Genome Travel Awards** | PAG Conference 30 (San Diego, CA)

2019 • ***Top-up Award*** | University of Florida, ANS Department

2017 • ***Study Abroad Scholarship*** | China Scholarship Council (CSC)

2016 • ***National Scholarship of P.R.China (Undergraduate)*** | Ministry of Education

2014-2015 • ***Outstanding Undergraduate Award*** | Huazhong Agricultural University, China

References

- ***Dr. Sanju Sinha (Postdoc Advisor)***
  ssinha@sbpdiscovery.org
  Assistant Professor
  Sanford Burnham Prebys Medical Discovery Institute

- ***Dr. Francisco Peñagaricano (PhD Advisor)***
  fpenagarican@wisc.edu
  Associate Professor
  Department of Animal Sciences, University of Wisconsin–Madison

- ***Dr. Hasan Khatib (PhD Committee)***
  hkhatib@wisc.edu
  Professor
  Department of Animal Sciences, University of Wisconsin–Madison