12

GENOMICS AND BIOINFORMATICS

Principal Investigator

Professor Hao Sun

Team Members

Yile Huang | Yingzhe Ding | Anqi Lyu | Liangqiang He | Zhiming He | Yulong Qiao | Yuwei Zhang | Xing Zhou | Manyi Wen

Research Progress Summary

In the reporting period, Professor Hao Sun and his team have 10 ongoing grants funded by the General Research Fund and Theme-based Research Scheme from the Research Grants Council, the National Natural Science Foundation of China/Research Grants Council Joint Research Scheme, and the Health and Medical Research Fund, and the Research Grants Council from the Food and Health Bureau, for studying of transcriptional regulation mechanisms in muscle stem cells as well as next-generation data analysis for plasma DNA/RNA sequencing. The team also published 5 papers in some high impact journals such as *Nature Communications* et al.

Research and Scholarship

Fellowships

Member's Name	Details	
	Fellowship	Organisation
Liangqiang He	Postdoctoral Fellowship	Faculty of Medicine, The Chinese University of Hong Kong

Journal / Conference Reviews

Member's Name	Details	
	Role	Journal / Conference
Hao Sun	Reviewer	Bioinformatics
		Clinical Biochemistry
		Clinical Chemistry
		Nature Communications
		RNA Biology

Grants and Consultancy

Name	Project Title	Funding Source	Start Date (dd/mm/yyyy)	End Date (dd/mm/yyyy)	Amount (HK$)
Hao Sun	Study on the Mechanism Underlying BMAL1/CLOCK-mediated Regulation of Human Stem Cell Homeostasis and Aging	National Natural Science Foundation of China/Research Grants Council – Joint Research scheme 2018/19	01/01/2019	31/12/2022	1,166,714
	Genome-wide Computational Identification and *in vivo* CRISPR Screen of Key Transcription Factors (TFs) and TF Hotspots Governing Muscle Satellite Cell Lineage Progression	Research Grants Council – General Research Fund	01/01/2019	31/12/2021	1,136,632
	Mechanistic Investigation of Linc-p27 Function in Skeletal Muscle Satellite Cell and Muscle Regeneration	Research Grants Council – General Research Fund	01/01/2019	31/12/2021	970,697
	Functional Dissection of lncRNA SAM in Skeletal Muscle Stem Cells and Muscle Regeneration	Research Grants Council – General Research Fund	01/01/2018	31/12/2020	1,232,466
	Plasma DNA as a Platform Technology for Cancer Detection	The Chinese University of Hong Kong Focused Innovations Scheme C	01/12/2016	30/11/2021	2,093,500
	Plasma DNA as a Platform Technology for Cancer Detection	The Chinese University of Hong Kong Matching Fund for Theme-based Research Scheme	01/12/2016	30/11/2021	4,444,000

Grants and Consultancy

Name	Project Title	Funding Source	Start Date (dd/mm/yyyy)	End Date (dd/mm/yyyy)	Amount (HK$)
Hao Sun	Centre for Research into Circulating Fetal Nucleic Acids	Research Grants Council – Theme-based Research Scheme	01/01/2016	31/12/2020	48,828,000
	To Investigate 3D Genome Dynamics during the Muscle Satellite Cell Lineage Progression	CUHK Research Committee – Direct Grant	30/06/2020	29/05/2021	62,000
	To Investigate Long Noncoding RNA (lncRNA) Nuclear Localization Mechanism by Genome-wide Analysis of lncRNA and RNA Binding Protein Interactions	CUHK Research Committee – Direct Grant	30/06/2019	29/06/2020	94,800

Publications

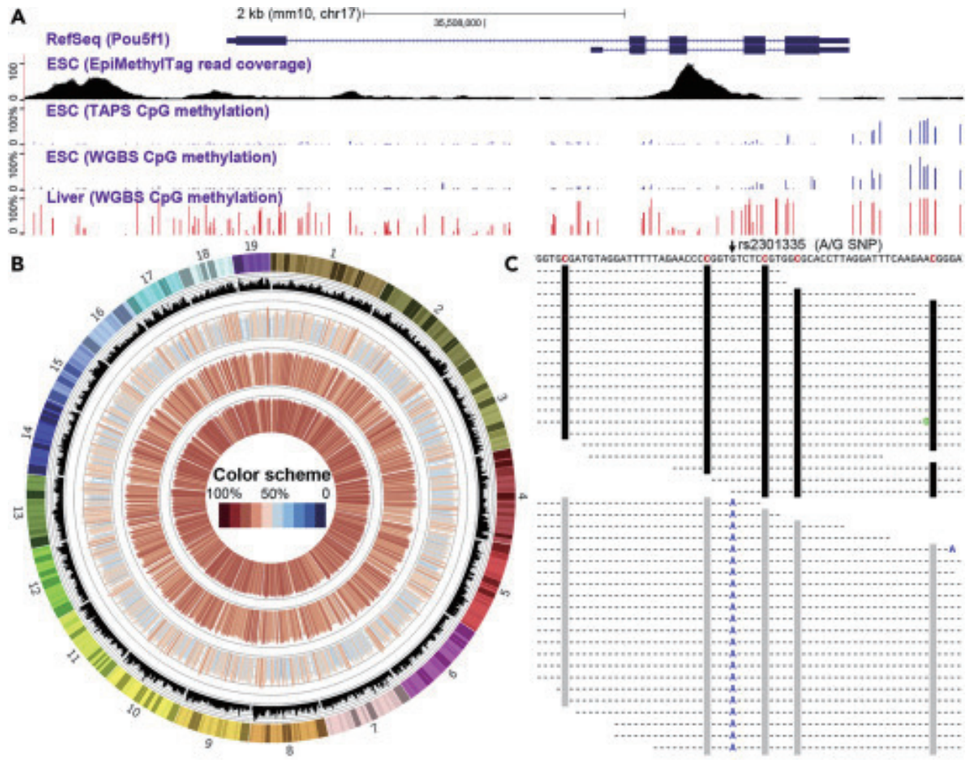
A. Journal Papers

1. Sun K, Li L, Ma L, Zhao Y, Deng L, Wang H, Sun H. Msuite: A high-performance and versatile DNA methylation data-analysis toolkit. *Patterns*. 2020;1(8):100127. doi:10.1016/j.patter.2020.100127.

2. Li Y, Yuan J, Chen F, Zhang S, Zhao Y, Chen X, Lu L, Zhou L, Chu CY, Sun H, Wang H. Long noncoding RNA SAM promotes myoblast proliferation through stabilizing Sugt1 and facilitating kinetochore assembly. *Nature Communications*. 2020;11(1):2725. doi:10.1038/s41467-020-16553-6.

3. Hou L, Wei Y, Lin Y, Wang X, Lai Y, Yin M, Chen Y, Guo X, Wu S, Zhu Y, Yuan J, Tariq M, Li N, Sun H, Wang H, Zhang X, Chen J, Bao X, Jauch R. Concurrent binding to DNA and RNA facilitates the pluripotency reprogramming activity of Sox2. *Nucleic Acids Research*. 2020;48(7):3869-3887. doi:10.1093/nar/gkaa067.

4. Fan F, Chen D, Zhao Y, Wang H, Sun H, Sun K. Rapid preliminary purity evaluation of tumor biopsies using deep learning approach. *Computational and Structural Biotechnology Journal*. 2020;18:1746-1753. doi:10.1016/j.csbj.2020.06.007.



Methylation data visualisation using Msuite

Source: Sun K, Li L, Ma L, Zhao Y, Deng L, Wang H, Sun H. Msuite: A high-performance and versatile DNA methylation data-analysis toolkit. Patterns. 2020;1(8):100127. doi:10.1016/j.patter.2020.100127.