

Opportunities in biomedical data science

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Slides: bit.ly/srop2023

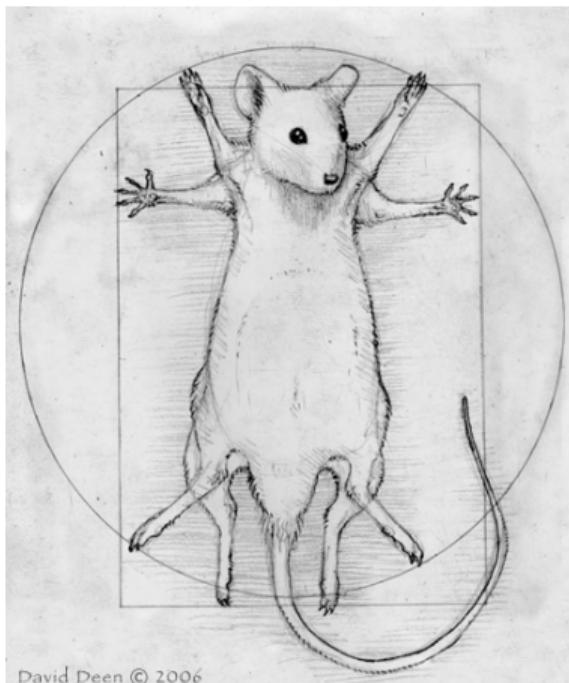
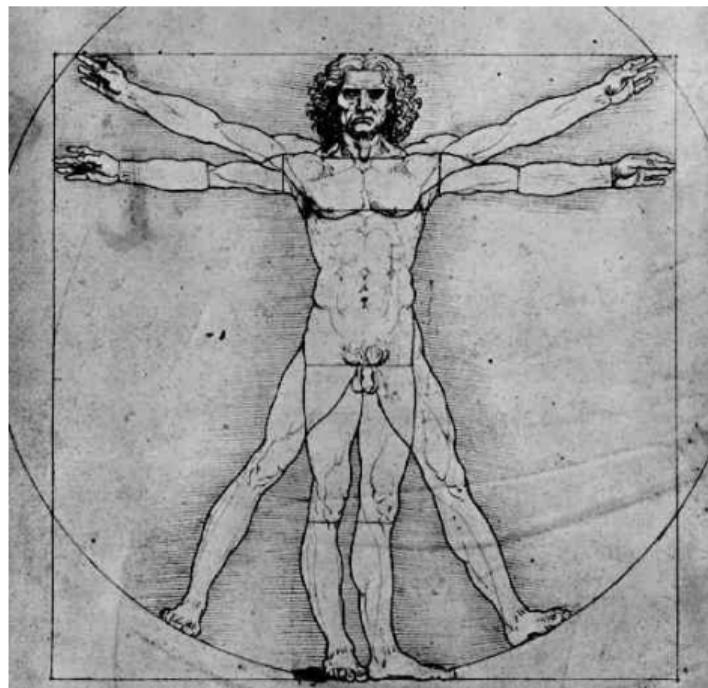
Biomedical data explosion

- ▶ Electronic health records (EHR)
- ▶ Imaging
- ▶ Genome/proteome/metabolome/microbiome data
- ▶ Personal activity/health tracking devices

Biomedical data explosion

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- ▶ Personal activity/health tracking devices
- ▶ High-throughput measurements in agriculture and ecology

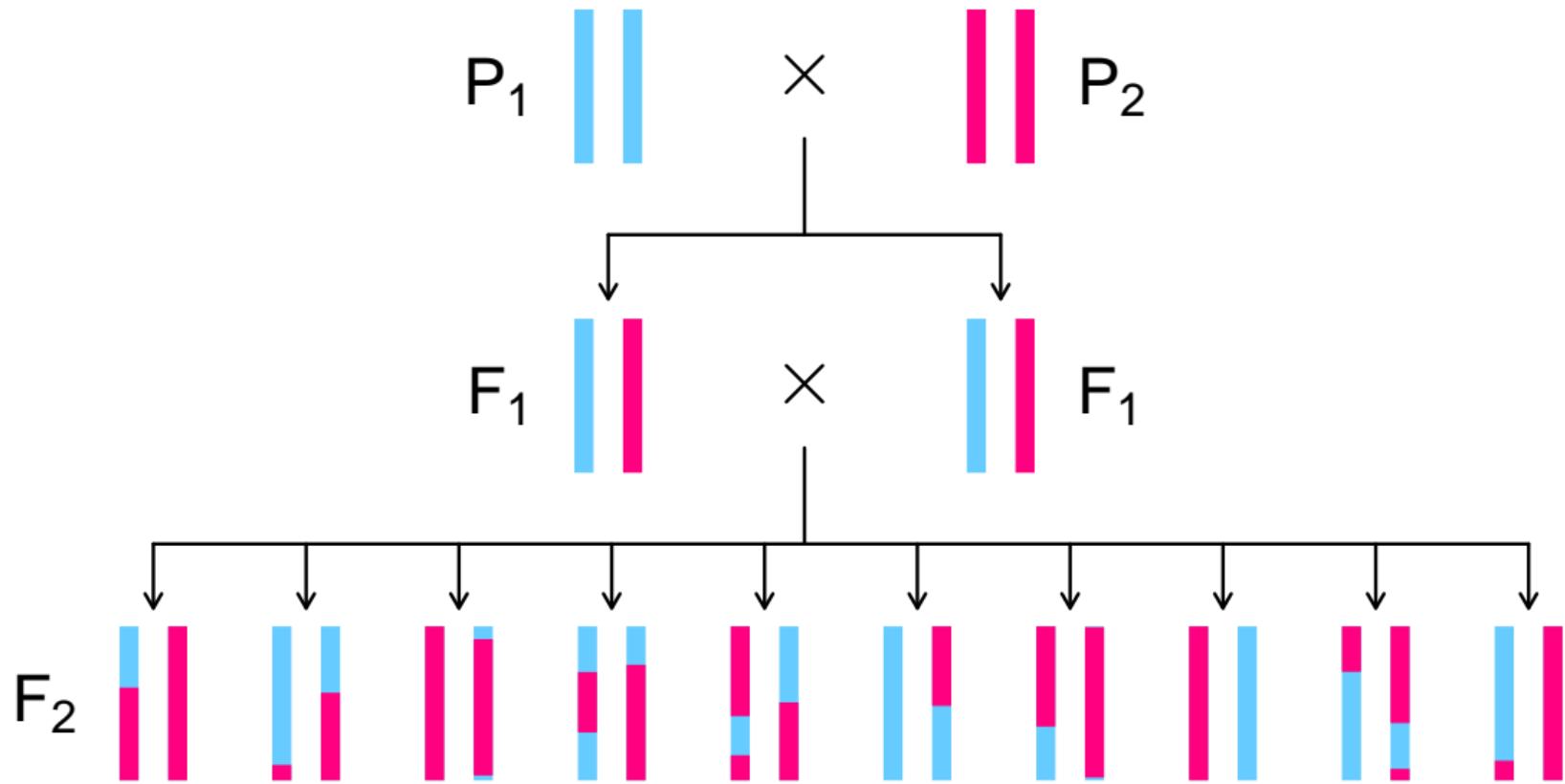




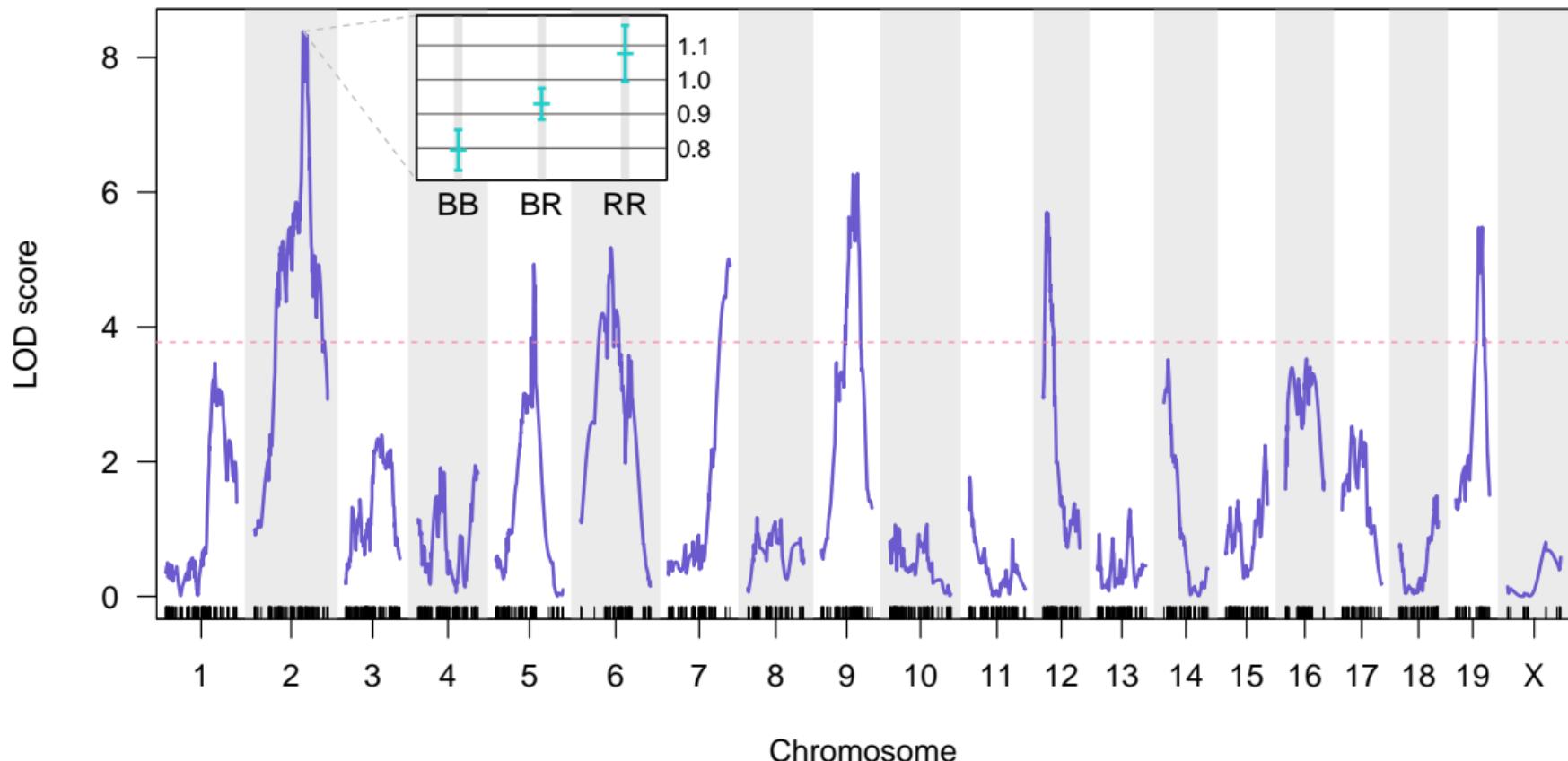
David Deen © 2006

daviddeen.com

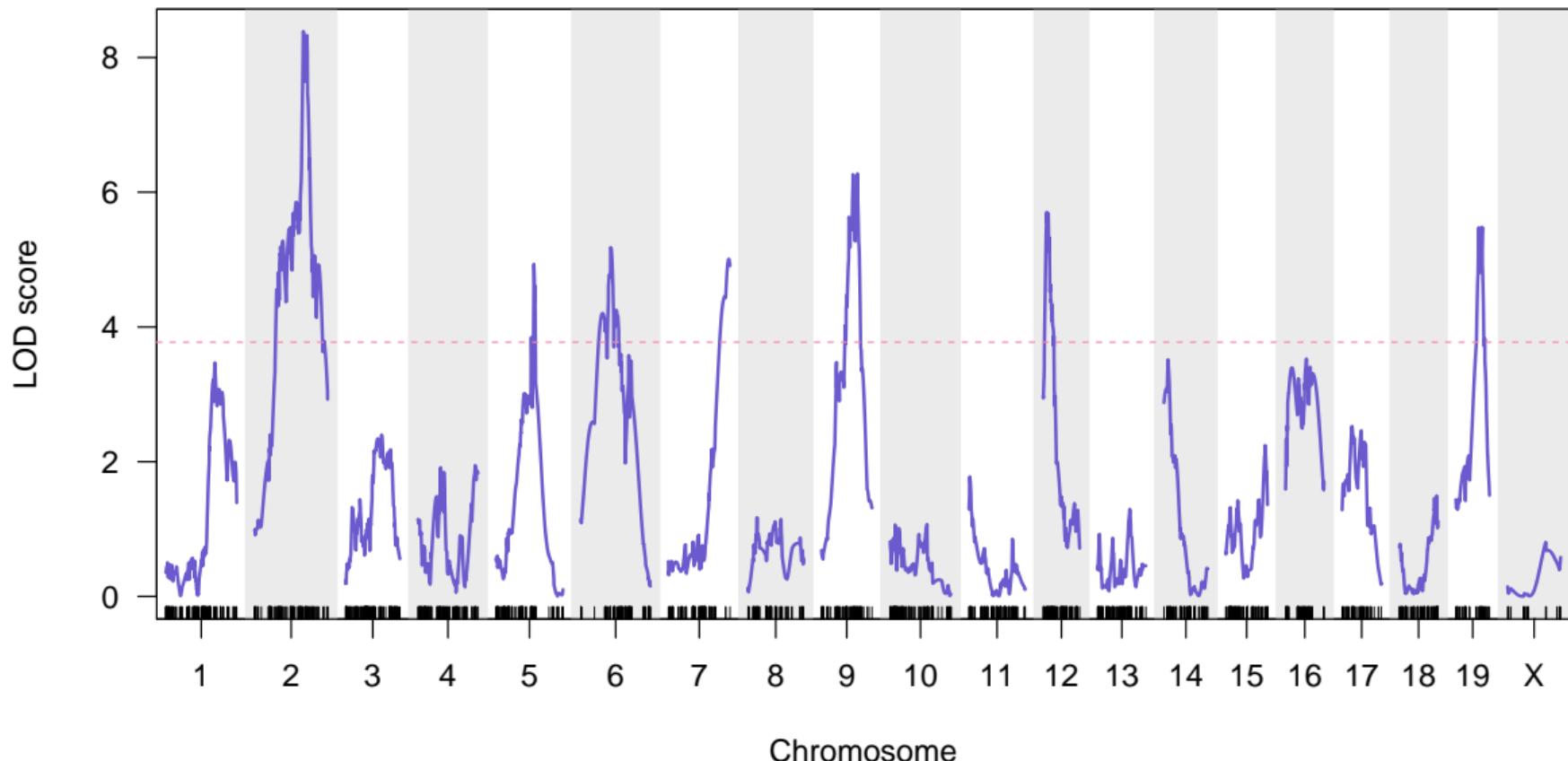
Intercross



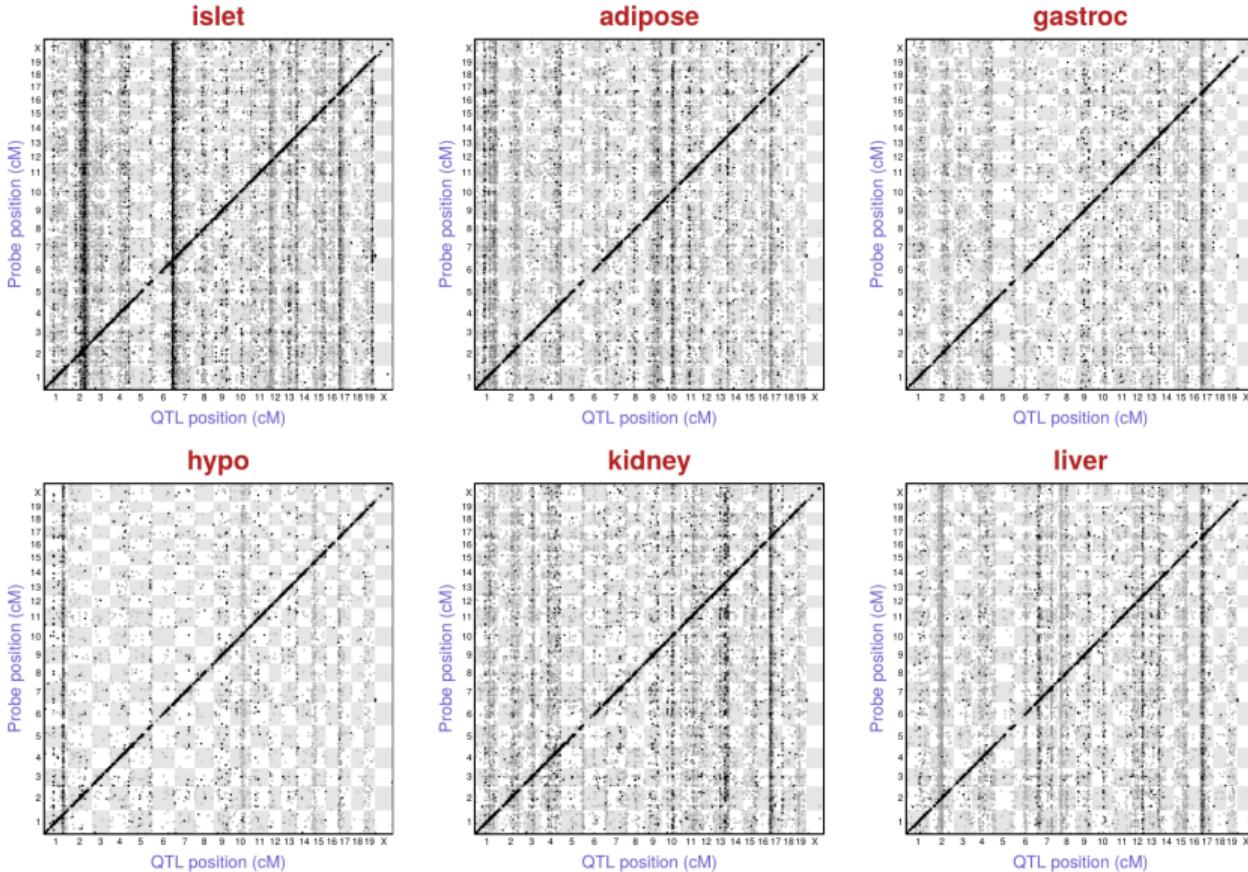
Genome scan



Genome scan

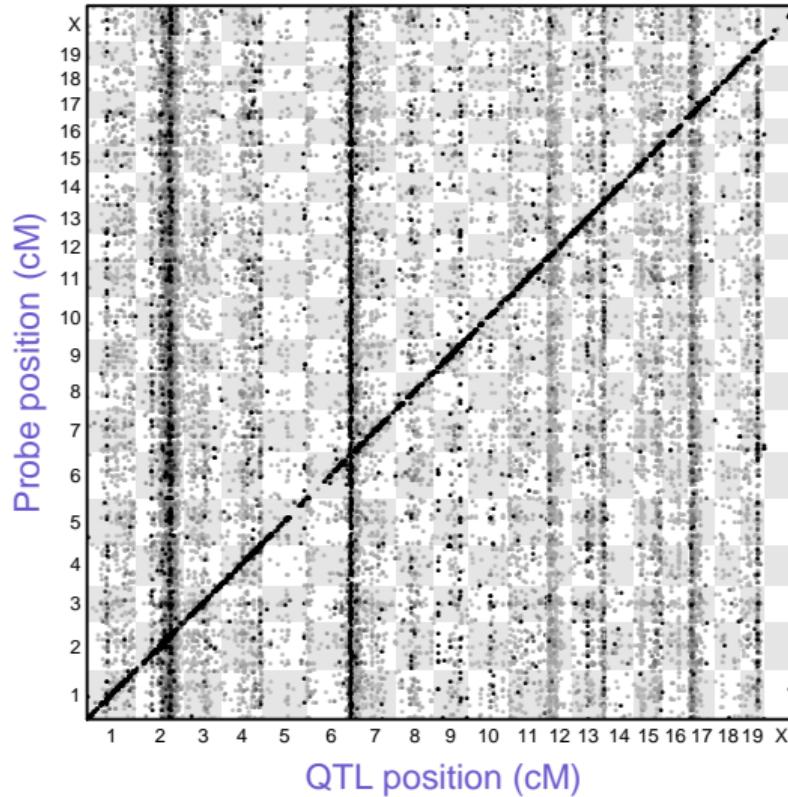


High-throughput phenotypes

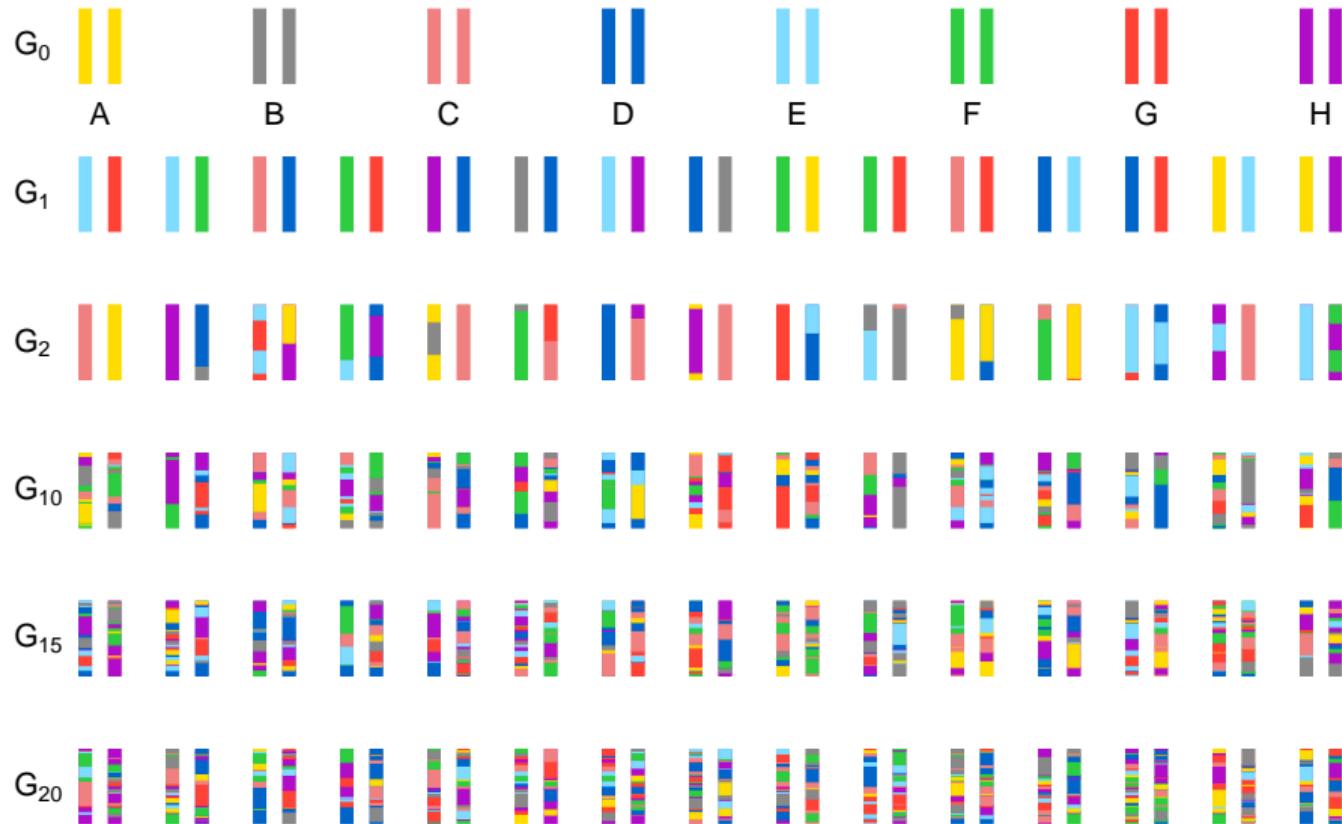


High-throughput phenotypes

islet



Multi-parent crosses



The work

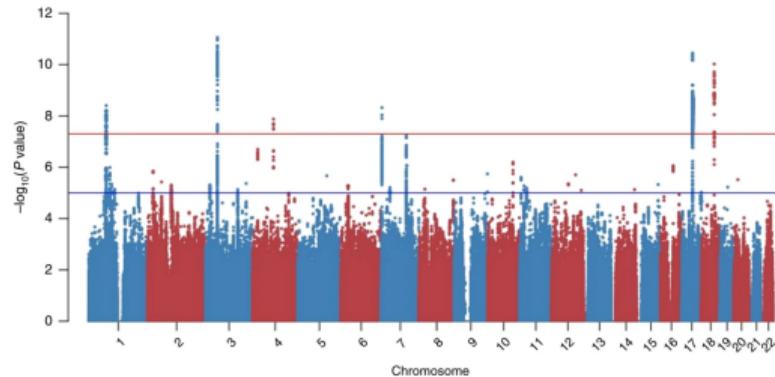
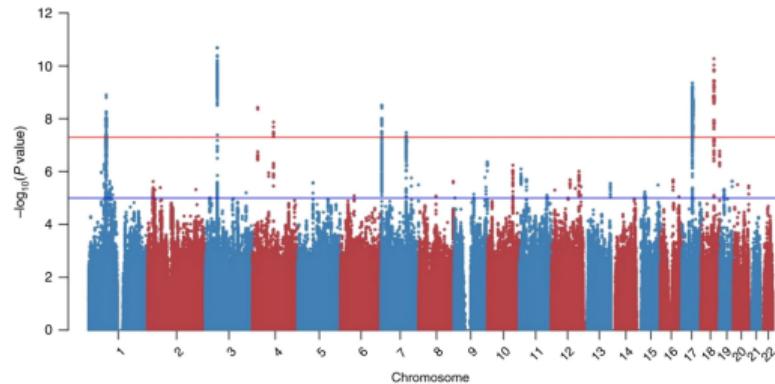
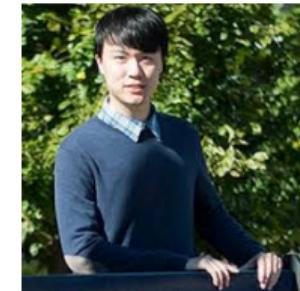
- ▶ Collaboration
- ▶ Data exploration
- ▶ Methods development
- ▶ Software development

The work

- ▶ Collaboration
- ▶ Data exploration
- ▶ Methods development
- ▶ Software development
 - R
 - C++
 - Coffeescript
 - Ruby

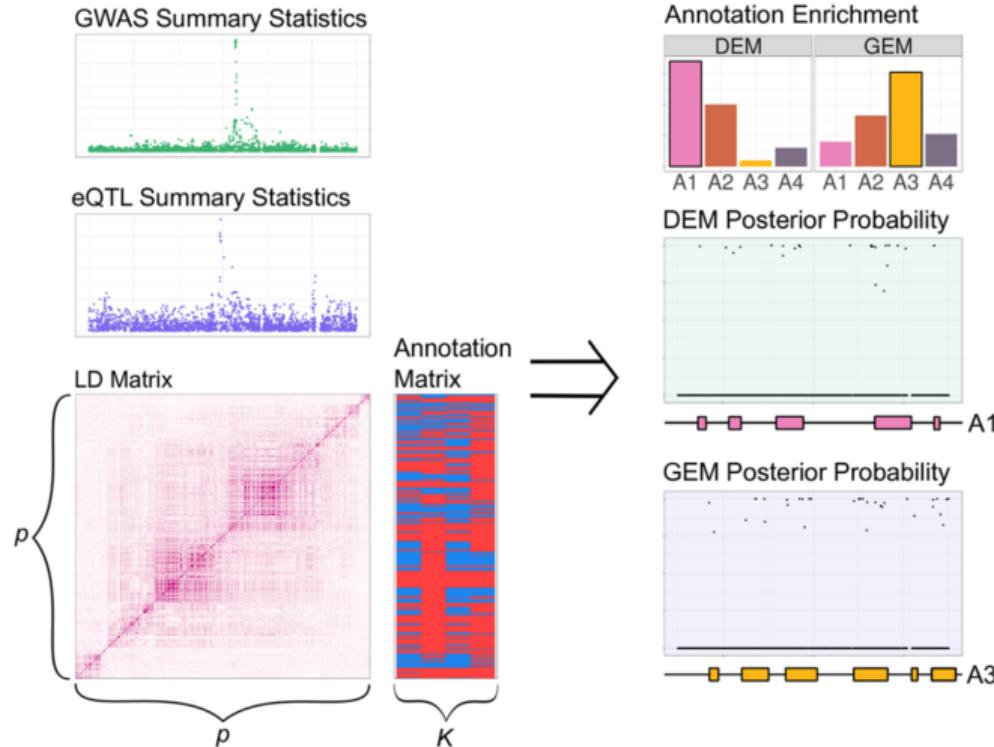
Qiongshi Lu

Human genome-wide association studies



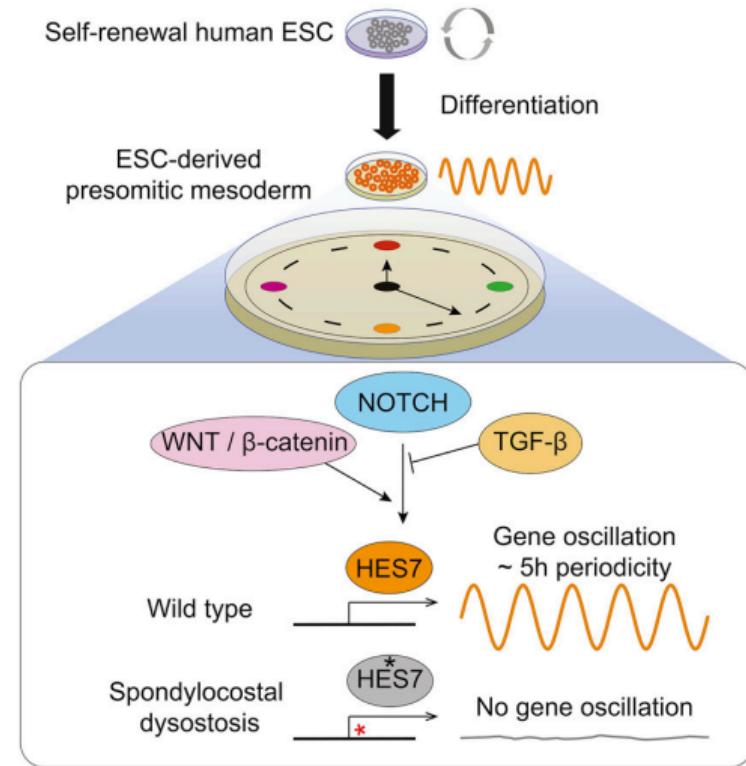
Sündüz Keleş

Functional mediation analysis



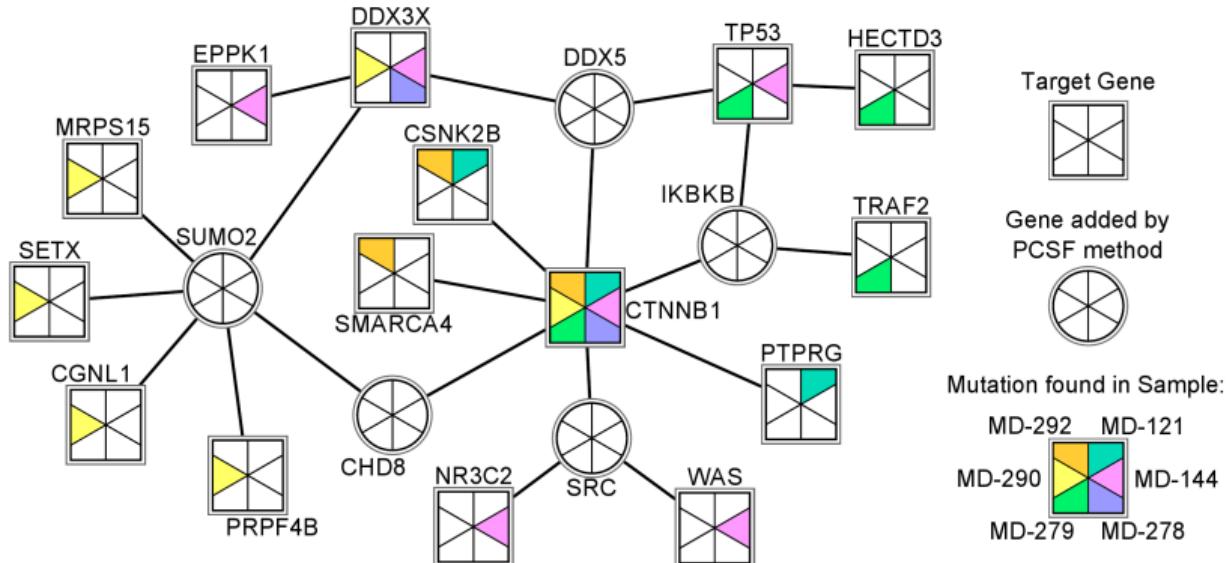
Christina Kendziorski

Clock genes in stem cells



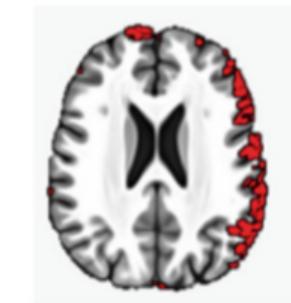
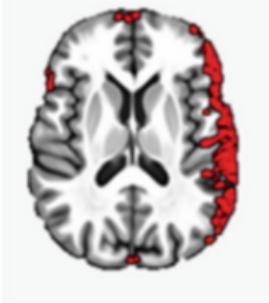
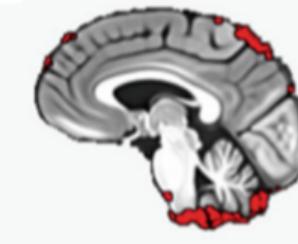
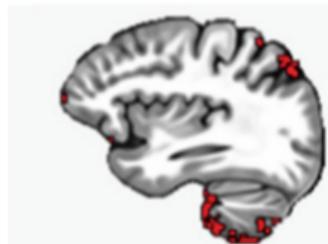
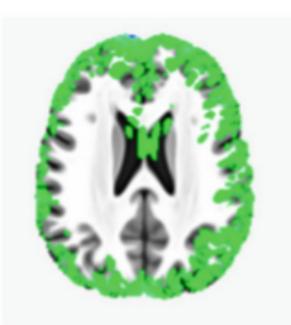
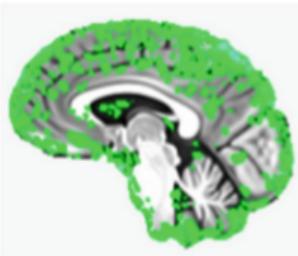
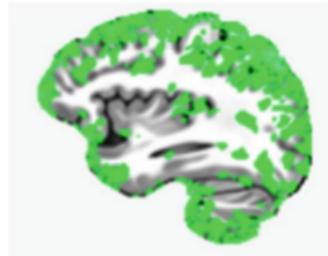
Tony Gitter

Pathways disrupted by cancer



Vikas Singh

Analysis of brain images



Biomedical data science PhD at UW-Madison

- ▶ Faculty spanning biostatistics, bioinformatics, and computer science
- ▶ Broad opportunities for scientific collaborations
- ▶ Flexible course requirements
- ▶ Research rotations
- ▶ Literature and professional skills seminars

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