

Opportunities in biomedical data science

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Slides: `bit.ly/carleton2019`

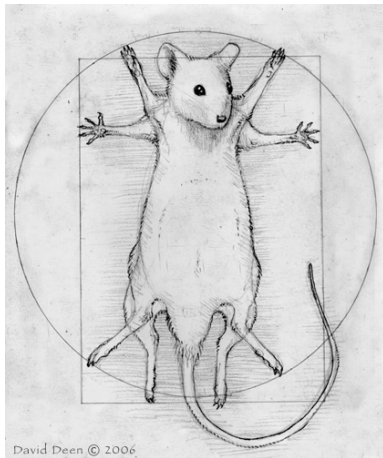
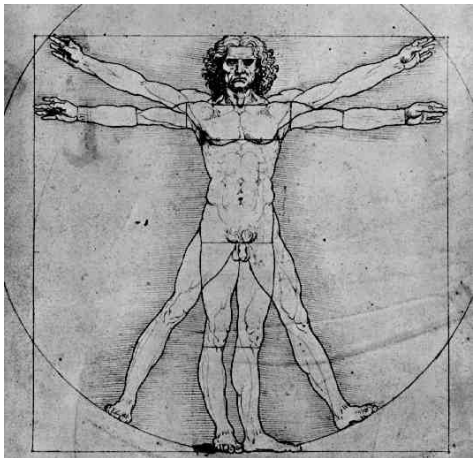
Biomedical data explosion

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

Biomedical data explosion

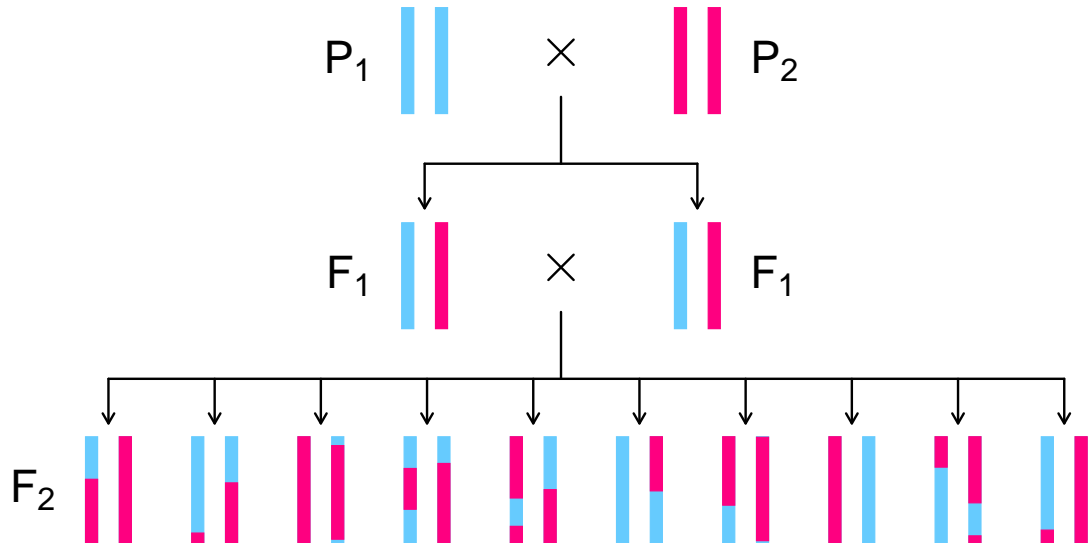
- ▶ Electronic health records (EHR)
- ▶ Imaging
- ▶ Genome/proteome/metabolome/microbiome data
- ▶ Personal activity/health tracking devices
- ▶ High-throughput measurements in agriculture and ecology



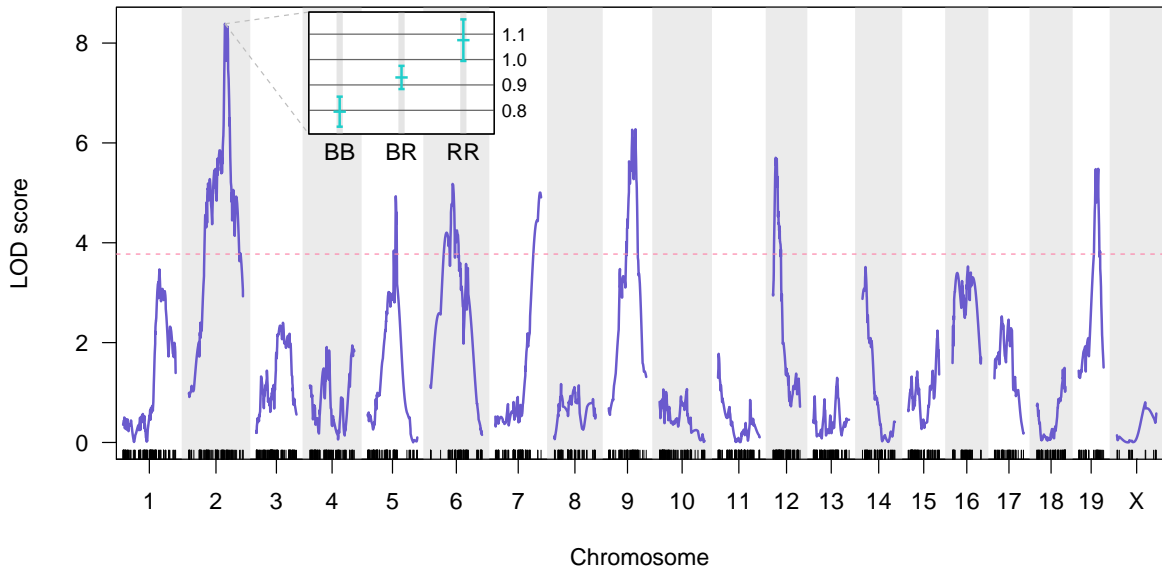


daviddeen.com

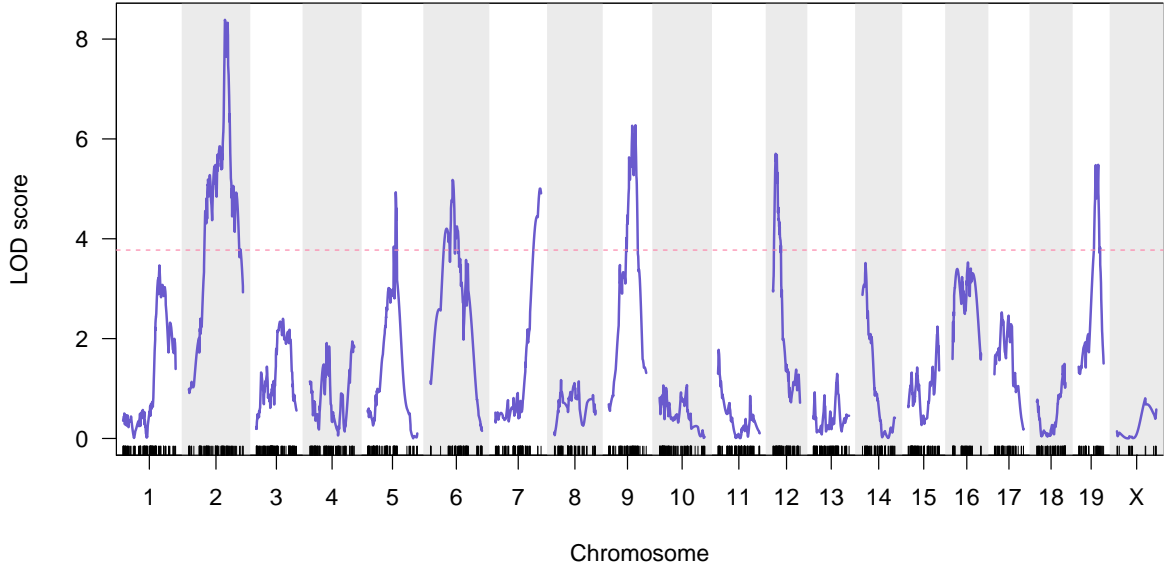
Intercross



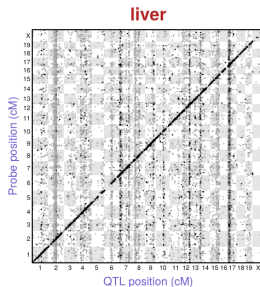
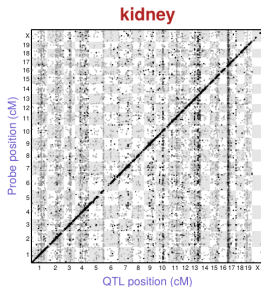
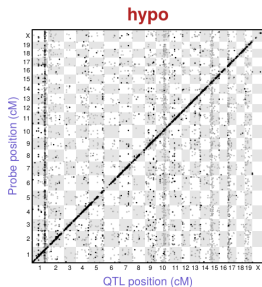
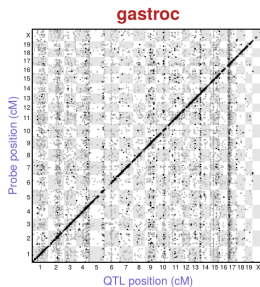
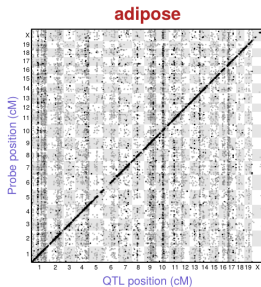
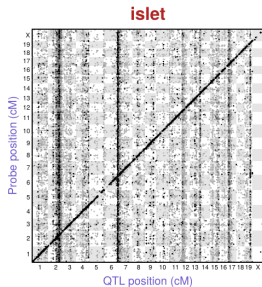
Genome scan



Genome scan

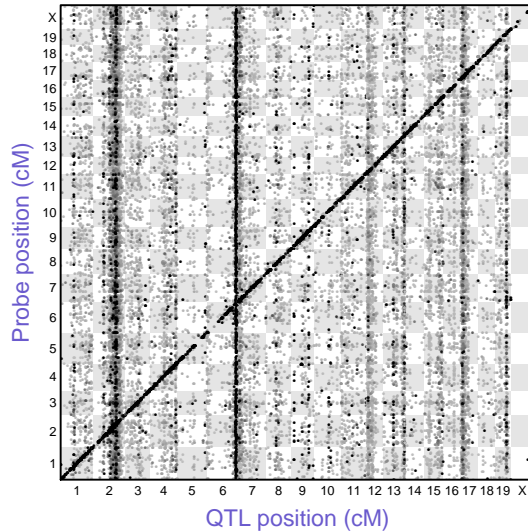


High-throughput phenotypes

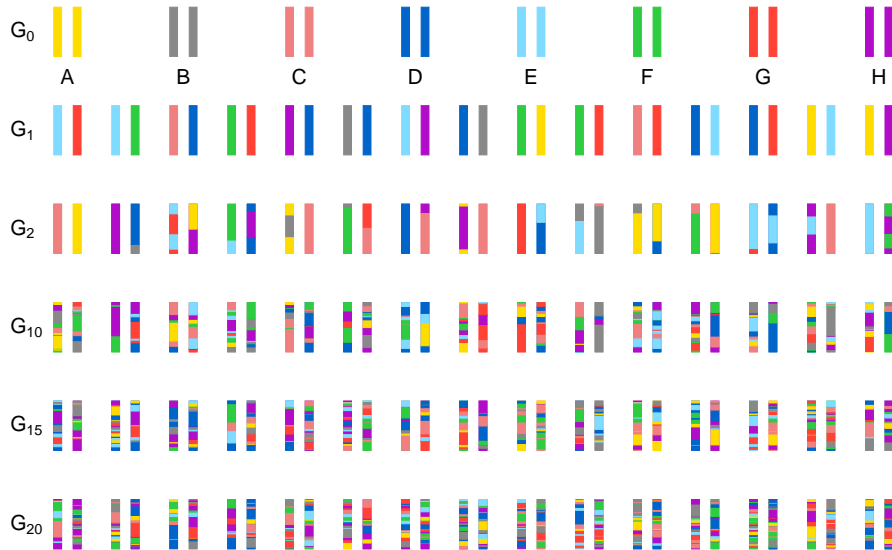


High-throughput phenotypes

islet



Multi-parent crosses



The work

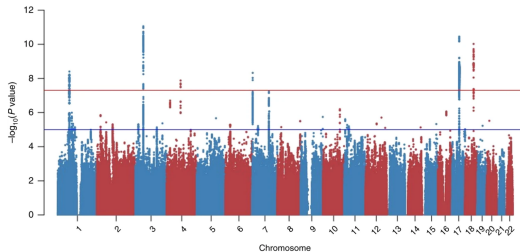
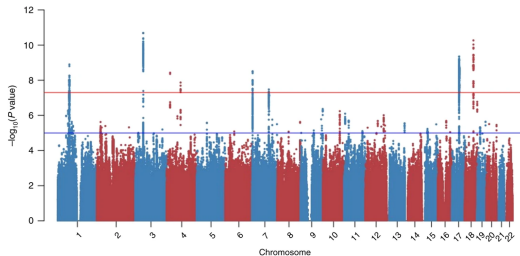
- ▶ Collaboration
- ▶ Data exploration
- ▶ Methods development
- ▶ Software development

The work

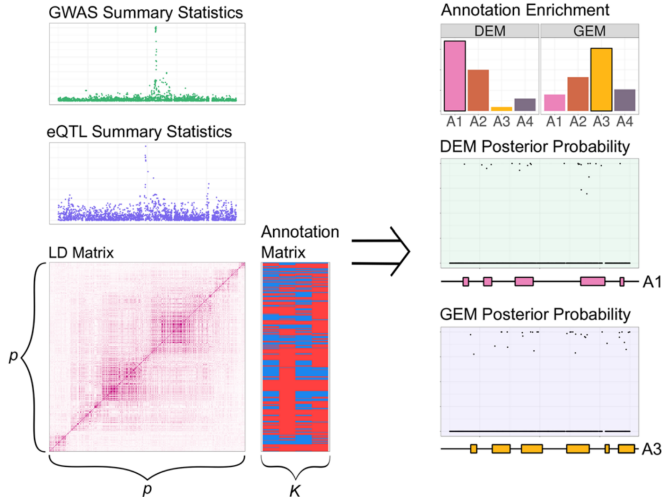
- ▶ Collaboration
- ▶ Data exploration
- ▶ Methods development
- ▶ Software development
 - R
 - C++
 - Coffeescript
 - Ruby

Qiongshi Lu

Human genome-wide association studies

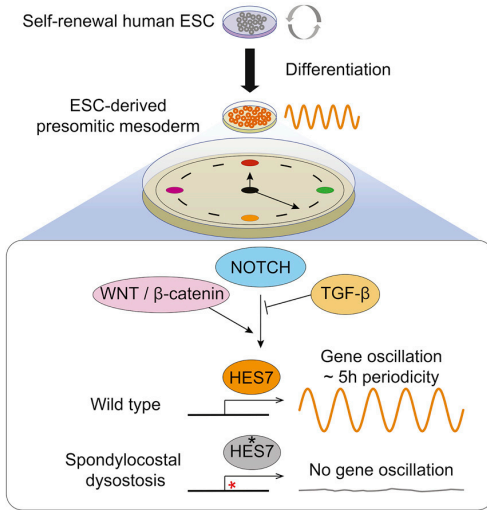


Functional mediation analysis



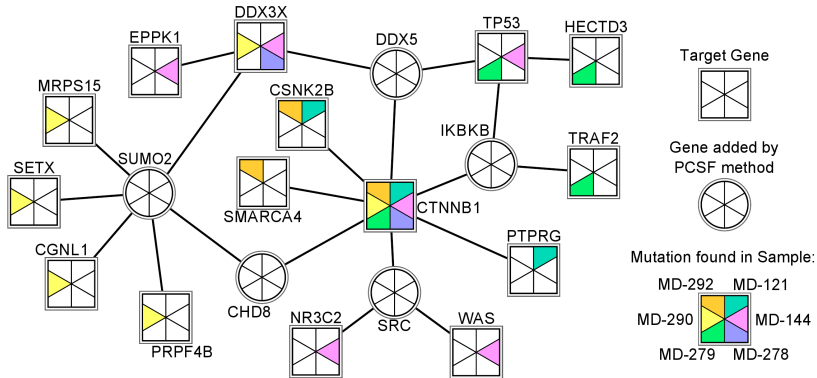
Christina Kendzierski

Clock genes in stem cells



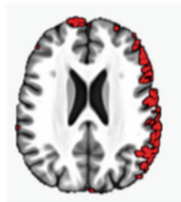
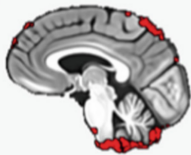
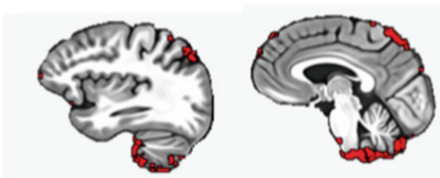
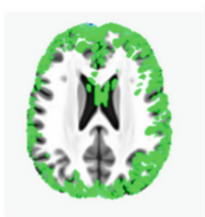
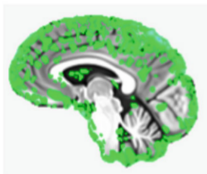
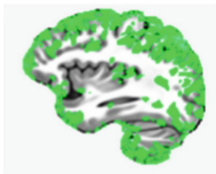
Tony Gitter

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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