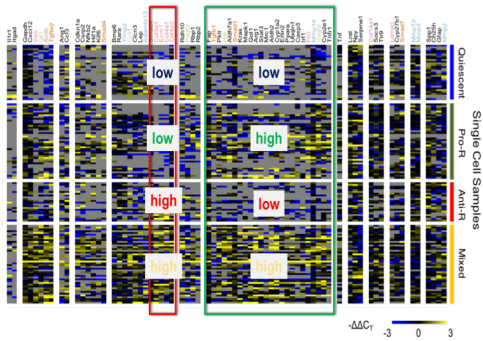


Modeling Multiscale Control of Liver Regeneration

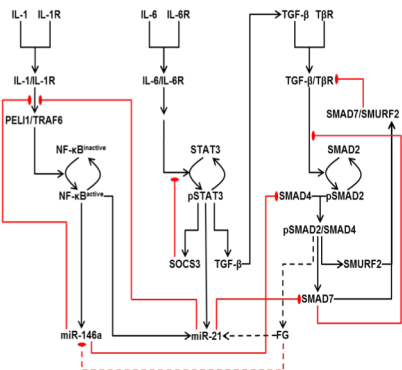
Jan B. Hoek and Rajanikanth Vadigepalli

Daniel Baugh Institute for Functional Genomics and Computational Biology
Department of Pathology, Anatomy, and Cell Biology
Thomas Jefferson University, Philadelphia, Pennsylvania

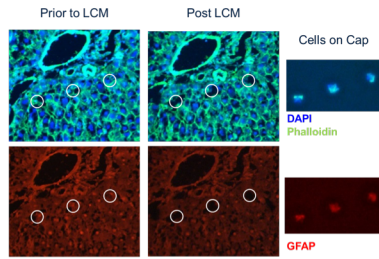
Hepatic stellate cell Single Cell Transcriptomics



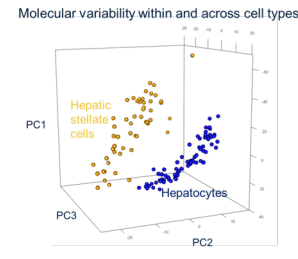
Cell-level Network Modeling of Cell Activation



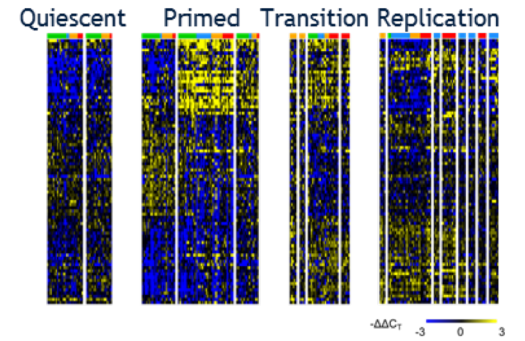
Laser Capture Microdissection



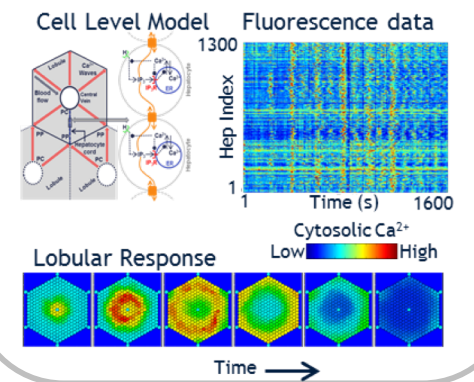
Cell Type Resolution



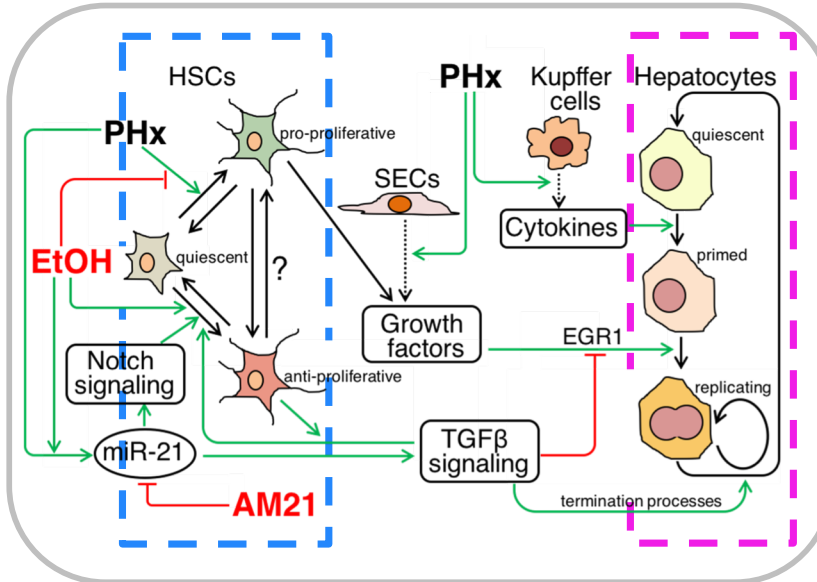
Hepatocyte Single Cell Transcriptomics



Spatial modeling of Lobular Scale Function



Modeling Multiscale Control of Liver Regeneration



Credibility Plan - organized along Ten Simple Rules*

1	Define Context	Modeling molecular and cellular interaction network controlling liver regeneration response to injury. Specific details in the manuscripts.
2	Appropriate data	Single cell gene expression from multiple liver cell types; Spatial data from intravital imaging; Noninvasive measures of liver growth and function
3	Evaluate within context	Evaluate computational model for match to physiological data from liver resection in normal and alcoholic liver disease models
4	List Limitations	Assumptions and expected applicability are detailed in the manuscripts

* Committee on Credible Practice of Modeling and Simulation in Healthcare

Credibility Plan - organized along Ten Simple Rules*

5	Version Control	Manual and Limited; Need to systematize
6	Documentation	Manual and developer-dependent; Need to systematize
7	Dissemination	Model code and documentation available via manuscript supplement; Need to share through a generalized resource (BioModels?)
8	Independent Review	Members of lab not involved with project conduct independent review; Need to establish a systematic workflow for independent external review
9	Test Implementations	So far: Matlab, CompuCell3D, and SBML
10	Conform to Standards	Conform to the best practice standards of SBML and BioModels

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