Accessible imaging analytics to elucidate microenvironment perturbations

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MEP-LINCS project: Systematic assessment of the impact of micro-environmental perturbagens

- Immunofluorescent staining for 10+ biological endpoints
- Quantitative novel image analysis algorithms to identify morphology, cell cycle, staining intensity,...
- Reverse Phase Protein Lysate arrays to assess up to 500 proteins and phospho-proteins
- L1000 assay to assess 1000 landmark genes

20 cell lines
~2,500 perturbations

2 perturbagens per spot:
1 ECM (insoluble) + 1 ligand (soluble)
Back-end infrastructure

To date:
220 plates
2M images
300M cells
3B features
80TB of data

**omero.lincsclarion.org**
Public web-only OMERO server on EC2 instance (r4.large w/ Ubuntu)

**Future read-only OMERO servers**
(see presentations by Douglas Russell and Chris Allan)

**www.lincsclarion.org**
Portal server providing query and visualization tools

**Firewall**

**OHSU on-site data center**

**MEP-LINCS OMERO server**

**ZFS file system**

**EBS volume**

**Dehydrated archives in S3**

**Portal server providing query and visualization tools**

**OMERO server on EC2 instance (r4.large w/ Ubuntu)**
LinCSClarion portal

User Feedback Mechanism
Out-of-session File Transfer

DCIC Related Experiments
DCIC Metadata Info

Image Feature Info Viewer
R/Shiny App Reports

OMERO Browser

Main Page

Gating drives dynamic image collection
Tensor MEMA Board & Clustergrammer

Gating drives dynamic image collection

Multiple Scatter Gather Image Viewers

LincsClarion portal

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Imaging visualization and analytics

- R/Shiny apps – custom data-specific analysis and interaction
  https://www.synapse.org/#!Synapse:syn2862345

- MEMAboard - PCA, t-SNE, heatmap, clustering
  https://maayanlab.github.io/MEMAboard/

- Zegami – highly interactive image displays w/ analytics