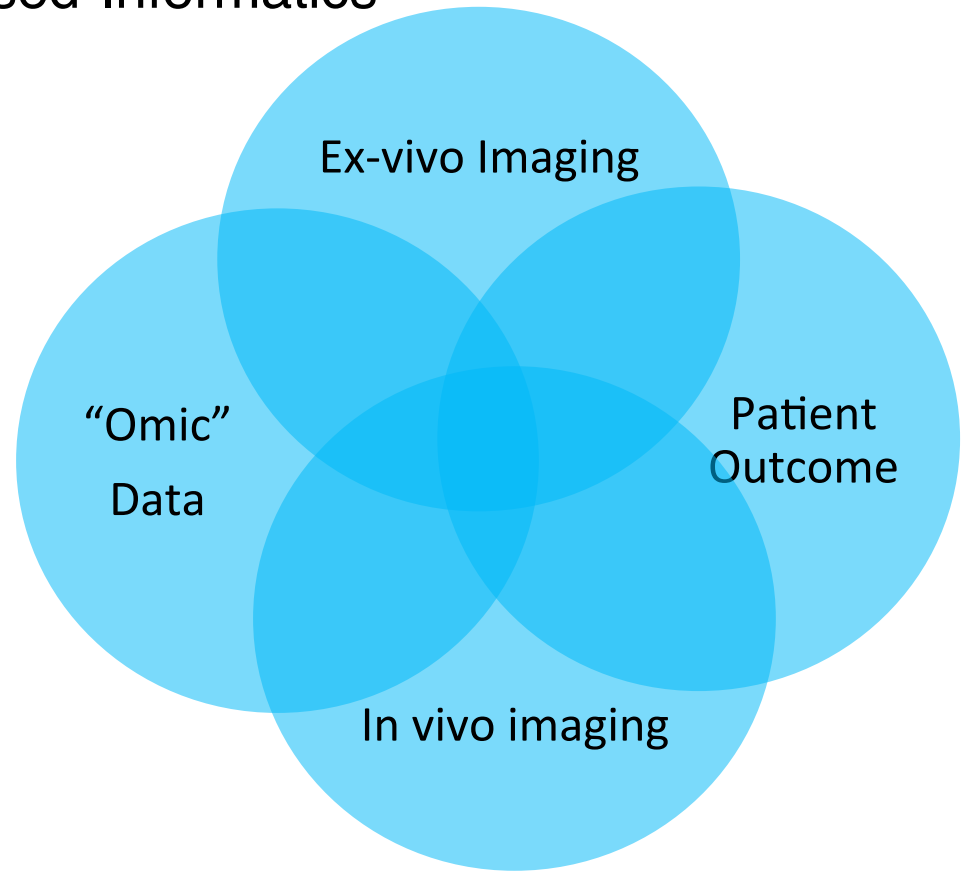




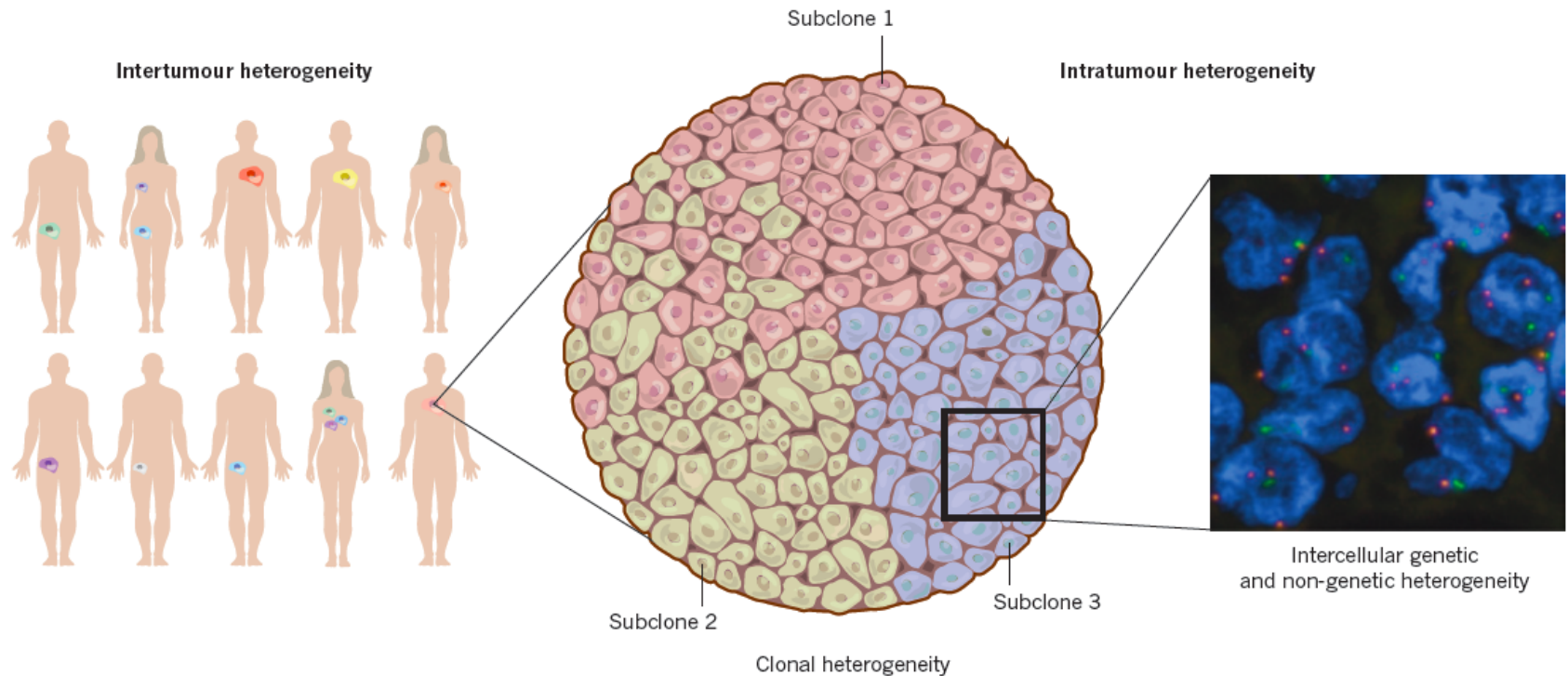
High Dimensional Fused-Informatics

- Anatomic/functional characterization at fine and gross level
- Integrate of anatomic/functional characterization, multiple types of “omic” information, outcome
- Predict treatment outcome, select, monitor treatments
- Integrated analysis and presentation of observations, features analytical results – human and machine generated



The causes and consequences of genetic heterogeneity in cancer evolution

Rebecca A. Burrell^{1*}, Nicholas McGranahan^{1,2*}, Jiri Bartek^{3,4} & Charles Swanton^{1,5}





“Domain”: Spatio-temporal Sensor Integration, Analysis, Classification

- Multi-scale material/tissue structural, molecular, functional characterization. Design of materials with specific structural, energy storage properties, brain, regenerative medicine, cancer
- Integrative multi-scale analyses of the earth, oceans, atmosphere, cities, vegetation etc – cameras and sensors on satellites, aircraft, drones, land vehicles, stationary cameras
- Digital astronomy
- Hydrocarbon exploration, exploitation, pollution remediation
- Solid printing integrative data analyses
- Data generated by numerical simulation codes – PDEs, particle methods



NCI Consortium: *Tools to Analyze Morphology and Spatially Mapped Molecular Data*
Stony Brook, Oak Ridge, Emory, Yale

Specific Aim 1 - Robust and scalable methods and analytic pipelines for multi-scale, integrative image analysis

Specific Aim 2: Database infrastructure to manage and query image data, image analysis results

Specific Aim 3&4: High performance software that targets clusters, cloud computing, and leadership scale systems; visualization middleware for 2D/3D image and feature data and for integrated image and “omic” data

Specific Aim 5: Tools using a suite of cancer driving biomedical problem, and collaborative support and training to the cancer research community