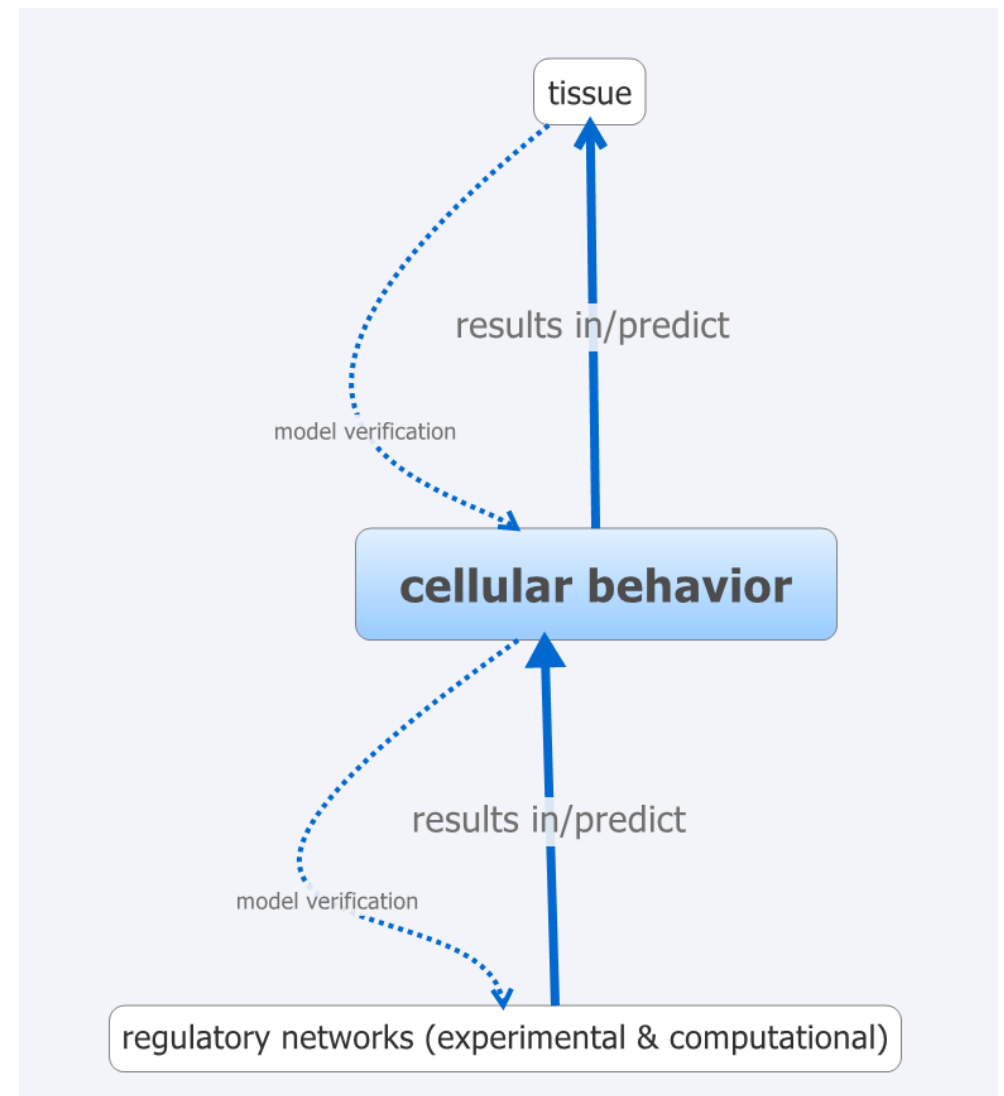


A Top-Down Hierarchical Description Of A Generic Tumor (An Attempt)

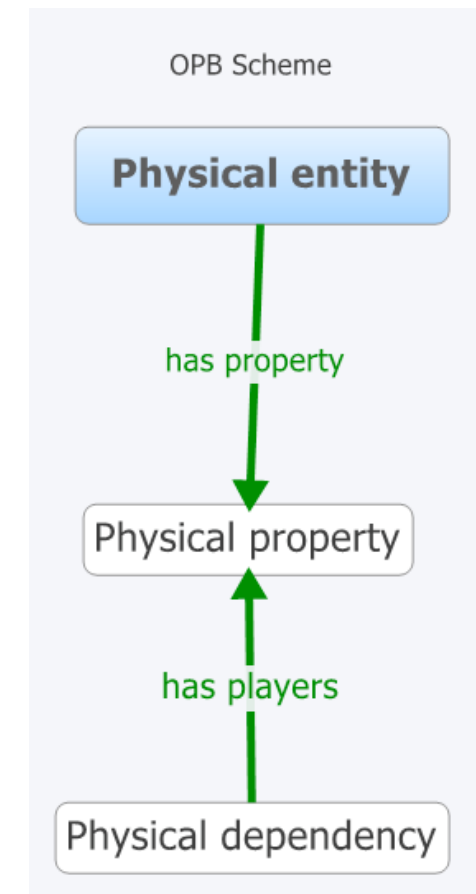
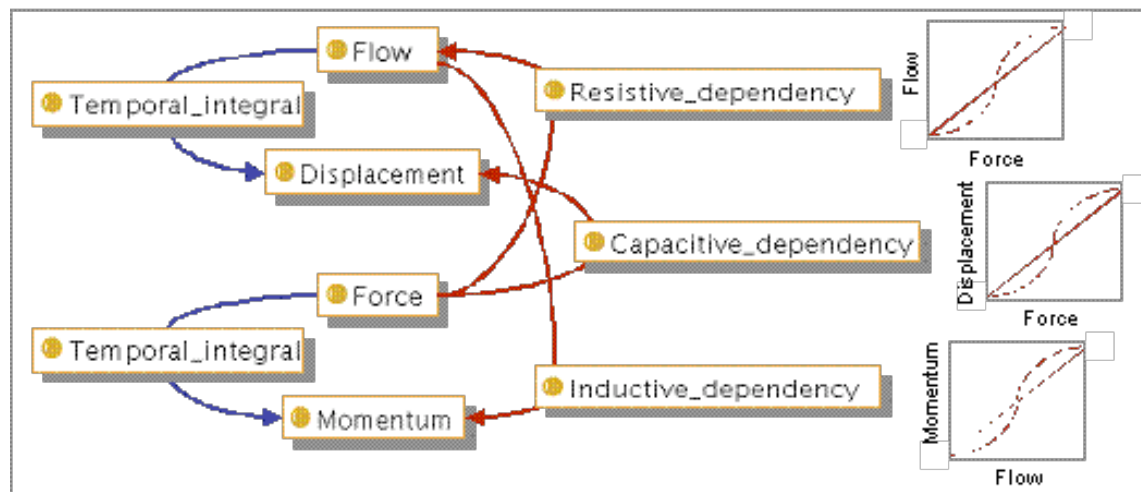
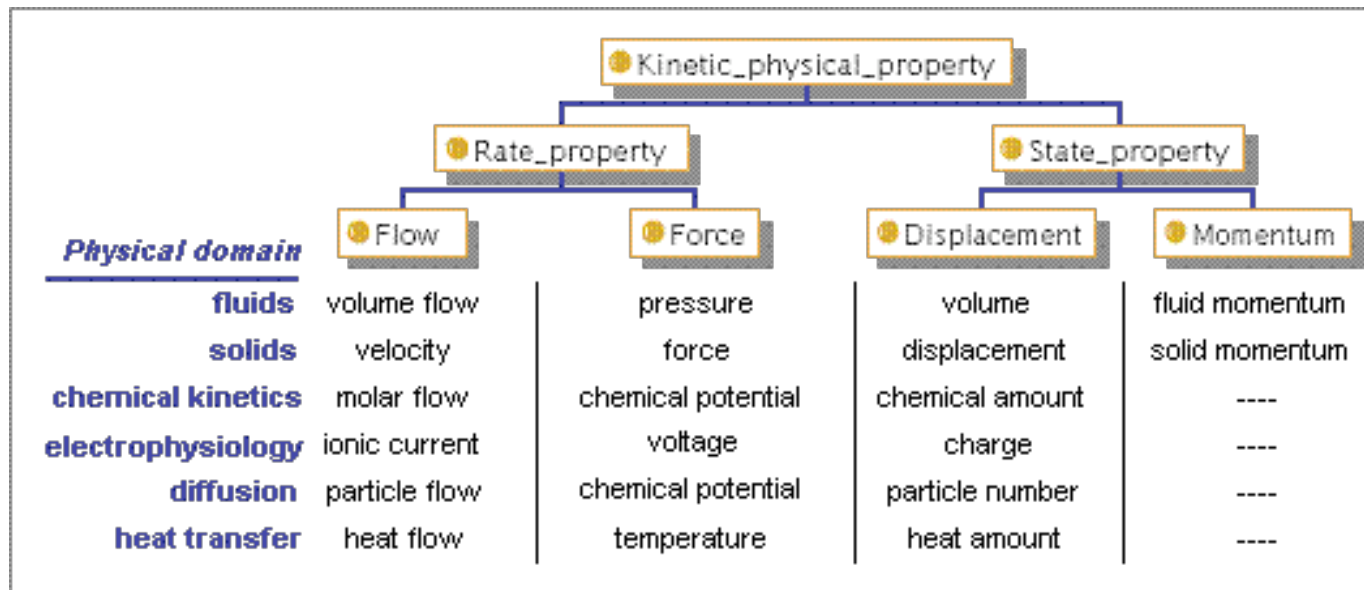
Abbas Shirinifard and James Glazier
Biocomplexity X, Bloomington
October 30, 2009

Why cell behavior is important?

- Serves as:
 - **End result** for gene regulatory networks
 - **Input for** top-down descriptions
 - Model verification for both scales
- Number of behaviors is much less than genes



Ontology of Physics for Biology



What is a behavior/process?

- A behavior is a results of a defined collection of physical entities, properties and dependencies.

Guidelines for making a top-down description

- The cells are the main components (scope: single cell vs. multicell)
- The description **should be** “behavior” based (why?)
- The description **should be implementation-independent**
- Going down the tree **should add** more detail
- Adding more detail to the description **should not change** the structure of the coarser description.
- The levels down a branch inherit properties of the higher level.
- Compatible with **Ontology of Physics for Biology**

Conclusion

- A top-down description not only helps computational modelers to build predictive models but also helps biologists to design more focused experiments.
- Cell Behavior Ontologies (CBO) does not tell us how to build a top-down description