

Model composition (aggregation) extension

Sept 9-10 workshop (UCHC/EBI/MPI)

<http://ntcnp.org/twiki/bin/view/VCell/CompositionSBMLWorkshop>

Hierarchical model extension

Apple did it first...



QTFF:

- Hierarchical tree structure
- Referential inclusion

How?

- Atoms that are not atomic... but self-descriptive
- Arbitrary containment implementation

What?

- Multiple movies, tracks, overlaps, operations etc.
- Extensibility (encodings, sprites, VR)
- Compatibility (ignoring atoms, "flattening")

The Proposed Solution

- ▶ Pre-requisites: 3 of the proposed L3 core enhancements
- ▶ Two specific changes/additions:
 - Model = container – listOfSubmodels
 - ▶ Fully hierarchical
 - ▶ Multiple instances allowed
 - ▶ Local or remote
 - ▶ Separate namespaces
 - Linking elements = overloading – listOfReplacements
 - ▶ (Semi?)hierarchical (possibly allow peer-to-peer)
 - ▶ Any element can be replaced (species, reaction, compartment, parameter, rule, etc.)
 - ▶ Any element can be deleted (replace with “null”)
- ▶ Some ancillary decorations:
 - Conversion factors
 - Ports

Usage and Possibilities

- ▶ Model composition
- ▶ Model collections
- ▶ Level 2 support and flattening
- ▶ Smart visualization
- ▶ CellML support
- ▶ Impact on other Level 3 efforts:
 - libSBML
 - Spatial
 - Arrays

Examples of Usage

- model collection -

- ▶ Different parameters
- ▶ Different protocols
- ▶ Different geometries
- ▶ Etc...

