

A Simple Upper Ontology in OWL for Biomedicine

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The Problem

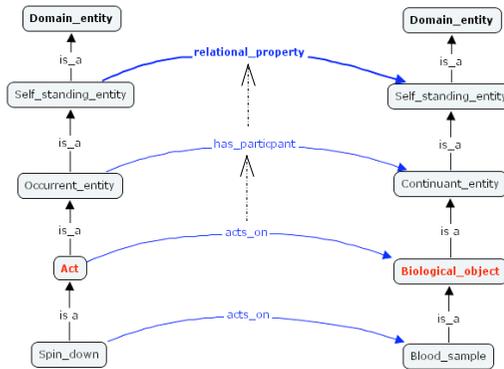
How do I represent concepts such as “spinning down a blood sample”? What is a “blood sample”? What is “Spinning down”? What property links them in this case? The diagram at the right summarises the goal and looks simple, but how do I determine which properties and classes to use?

The Process

Identify the relevant branches of the upper ontology by asking questions as shown below. Then classify to show the complete structure as at the bottom right.

Then look for the properties that link the classes as shown in the property hierarchy at the top right.

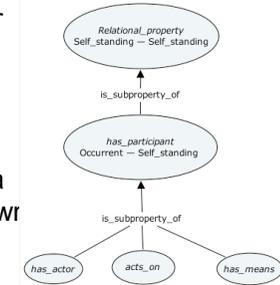
The Goal: Classes linked by appropriate Properties



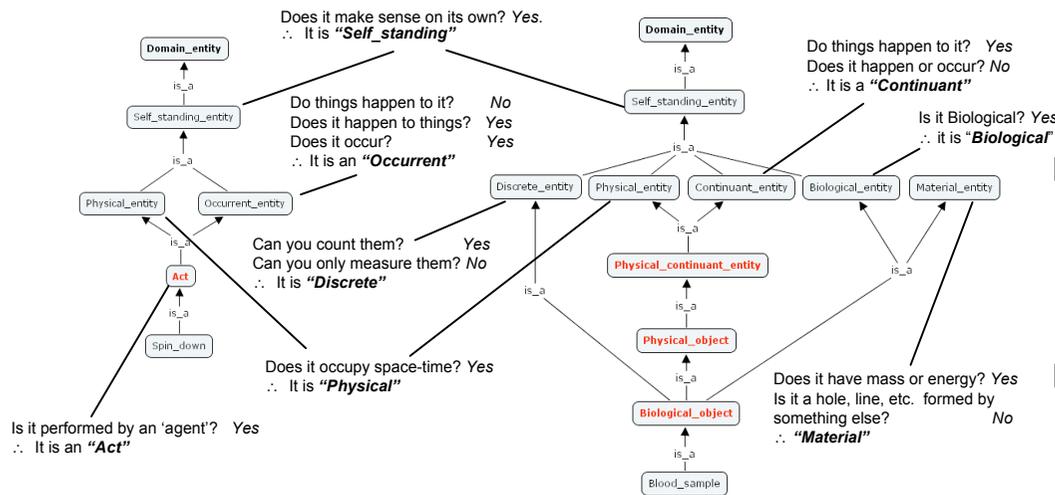
Examine the Property Hierarchy

The function of the upper ontology is to constrain which properties can be used with which entities.

The property hierarchy, a fragment of which is shown here, is therefore as important to the upper ontology as the class hierarchy.

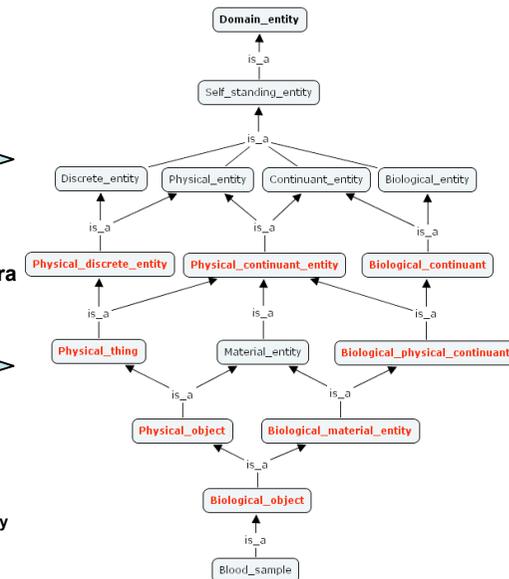


Sketch the Class Hierarchy by Asking Simple Questions



Determine the full lattice of classes to test against the property hierarchy

Automatic classification gives rich lattice for blood sample filling in extra implied classes from top ontology



NB: Classes in red are “defined”, e.g. **Physical_discrete_entity** = **Physical_entity** AND **Discrete_entity**