POC Meeting December 8-9, 2003 **MINUTES**
Attendees:
Felipe
Peter
Leszek
Pankaj
Toby
Leonore

1.Specific Aims
Primary goal is to establish high level terms of the ontology.

See agenda prepared by Toby for specific agenda of the meeting
(STL_Agenda.pdf).

We decided to restrict ourselves to one aspect of the ontology (anatomy) first and
learn from this experience.

Some problems were identified with the concept of 'anatomy' since this really
describes histology and does not take into account all of the types of terms we
are defining. Anatomy is only a part of the ontology. Therefore the highest level
node changed to Plant Structure.

From the initial agenda item: top level nodes of the ontology we came up with
this skeleton.

Plant Structure (ontology)
            Gametophyte

            Sporophyte
                    Seed
                    Embryo
                    Root
                    Shoot
            Cell type
            Tissues
            Organs

This seems to accommodate all high node terms from Maize, Gramene and
Arabidopsis. Mostly requires moving meristem to an instance of a tissue and fruit
as a part of the sporophyte to accommodate differences between TAIR and
Gramene ontologies- adds nodes to the maize ontology.

Question: Should we use terms : plant cell , plant tissue, plant organ???

Concepts that are used in dividing or binning attributes in anatomy- all have been/may be used.

> Morphological features
> Anatomical/Histological features
> Location
> Derivation (eg. Fruits from ovaries)

<u>Question- should some of these bins be considered attributes and not instances of terms?</u>

Issues for group discussion:

Big Issues:

1. Need for new relationship types: a) Is sometimes a part of , and b) contained in.

We found that unless we include alternative relationship types to the three in use (isa, part of and develops from) we will rapidly proliferate terms and create very species specific nodes almost immediately. For example in the case of embryo as a part of the seed. If an embryo has as its parts- cotyledon, leaf (e.g. in Maize), axis-we will violate the true path as all embryos do not have leaves. Therefore we suggest invoking a new relationship type:
<u>is sometimes a part of</u>

Noted that at the GO meeting in Bar Harbor, the potential need for this and other conditional identifying and non identifying relationships, was noted. GO is not invoking these, and currently uses part of in the strict sense (ALWAYS a part of).

In fact, given the way the annotations are done, many terms would never be used by annotators from another organism-Practically, this generates some degree of species specificity for terms- but then adds a lot of burden to the terms and definitions.

Invoke a second relationship type: <u>Contained in</u>.

The rationale is to be able to accommodate something like an embryo sac which IS A gametophyte that is CONTAINED IN a sporophyte.

If we include these new relationship types then
we should suggest these relationship types to be included in OBO-rel at
http://cvs.sourceforge.net/viewcvs.py/obo/obo/ontology/OBO_REL/

2.How to deal with the need for 'combinatorial annotations'? Many terms may be more appropriately developed as combinatorial terms- as either a cross product between anatomy and temporal (e.g. seedling apical meristem) or a body part combined with an attribute (fleshy fruit). We must address this issue fairly immediately-we can still try and create terms that are needed for annotations but realistically we may not be able to wait until GO structure/tools change to accommodate this.

How we are to deal with spatial and temporal attributes? In some cases we will need to create and define the cross product and include in the ontology with the intent of eventually separating things out again. This may be related to point 3.

3. When to instantiate/create a term vs. when to assign as an attribute. For example, order number can be an attribute of a leaf or internode rather than create an instance of first leaf, second leaf etc…We need some concrete rules to minimize the 'term explosion' caused by instantiation of variations.

Smaller issues

1. Synonyms
GO and others include relationships in synonyms such as broader, narrower (terms currently used in MaizeDB and by many thesauri). We can also consider the 'misnomer' class of synonym.

Another thing to consider is association of terms with taxonomic classification. GO does this in some ways by use of sensu term. The taxon id(s) associated with a term could be included as an additional field/association to a term. For example, the term spikelet could be associated with the taxon Zea mays.

We may like to adopt the similar guidelines from GO
http://www.geneontology.org/GO.synonyms.html

2.Transformational homology and serial homology.
Suggest that serial homology be addressed in the definitions of the terms rather than in the structure. For example, to address the relationship among leaf-like organs such as leaves, and modified leaves such as petals and bracts.We may also consider other types of relationship- derived from and related to (any suggestions for better, less ambiguous terms).

3. to what degree of granularity do we want to define terms? In particular- how much novelty or exceptions to the rules do we need to take into account? That

may be determined on an as needed basis as we may not be able to define a taxon specific cut off as with GO.

4. To what degree do we incorporate terminology for organisms we know are coming .As we build we need to consider Populus and loblolly and accommodating woody structures and life histories. Perhaps concentrate on terms to accommodate Solanaceae first since we know they will be 'coming in to the project sooner. But all agreed to bear in mind potential exceptions to the rules we defined.

Action Items: To be completed before in person meeting at PAG.
Pankaj-
Pull out all terms and make alphabetical listing to generate a unique set of terms. DONE 12/23/03

Add new relationship type (sometimes a part of) in the appropriate version of DAG editor.

Pull out all the possible attributes and see if they can be organized on an attribute Ontology being developed as part of Phenotype Ontology. This will include attributes and values e.g. Shape
---%attribute\:morphology ; PATO:00000129
-------%attribute\:shape ; PATO:00000130
------------<value\:branched ; PATO:00000137
------------<value\:cleft ; PATO:00000139
------------<value\:coiled ; PATO:01001139
------------<value\:curled ; PATO:00101139 ; synonym:curly
------------<value\:curved ; PATO:00001139
------------<value\:flat ; PATO:00002139
------------<value\:globular ; PATO:00040139
------------<value\:oblate ; PATO:00000135
------------<value\:pinnate ; PATO:00000136
------------<value\:round ; PATO:000001313
---%attribute\:spatial
--------<value\:superior
--------<value\:inferior

Pankaj, Leonore and Leszek-
Term triage team: this group will go through existing terms and determine which do and do not belong in the ontology.

<u>Felipe/Peter-</u>
Add/import definitions –one set of complete and accurate definitions
Use list provided by Pankaj to import the current normalized (unique)set of terms into the ontology.
Assign synonyms as needed from the set of terms
Check/validate the true path for all terms.

<u>Ontology working groups-</u>
Peter suggested we form small working groups (2-3 people) to deal with the more difficult issues. The group would develop structures to be presented to the developers group in January at PAG.

Fruits: Peter and Felipe
Leaves: Peter and Pankaj
Inflorescences: Peter, Toby (Leonore), leaves (with Pankaj), inflorescences (with Toby- come up with a few ways of dealing with this), evolutionary modification issues- still have to deal with serial homology and transformational homology.
Roots: Peter and Leonore (Katicia)

Peter and Felipe will fill in holes   such as in meristems, roots, gametophytes