The Straightened Mouse:

Translating spatial relations between ontologies and geometric models

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Content

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- Anatomy Ontologies
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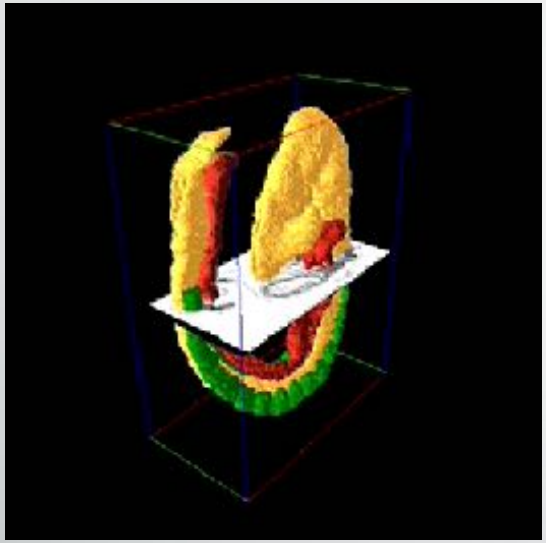
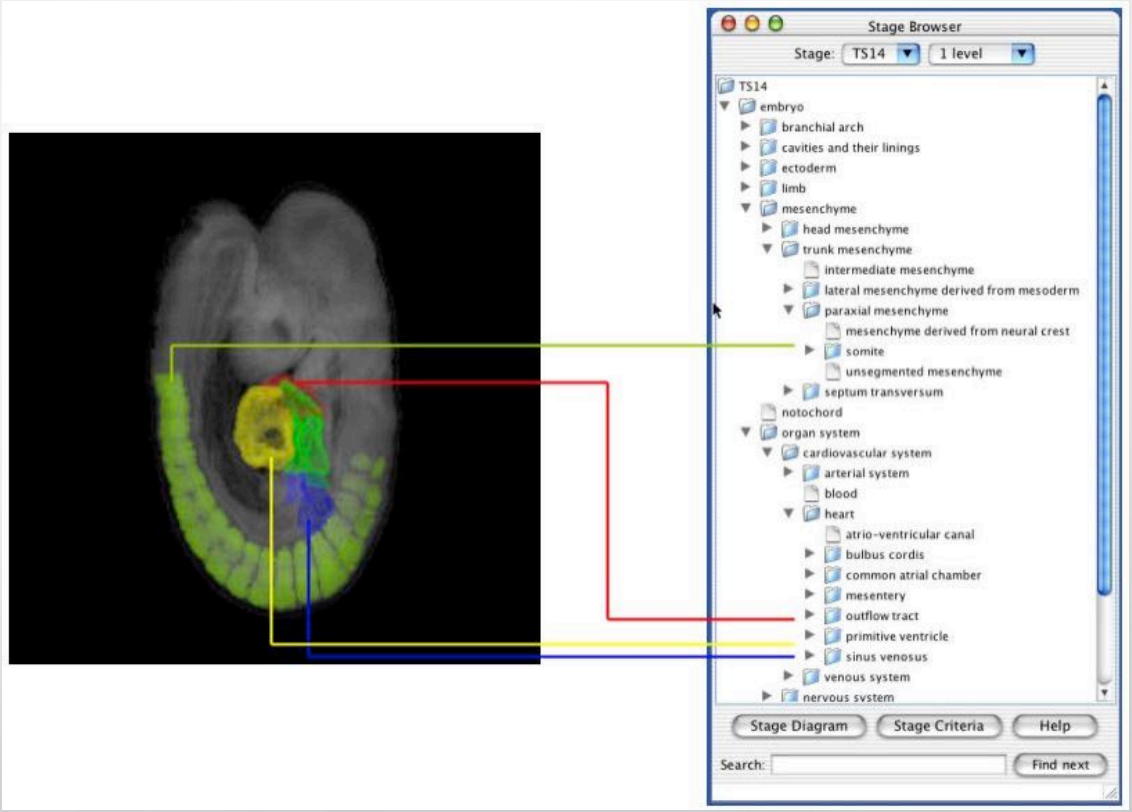
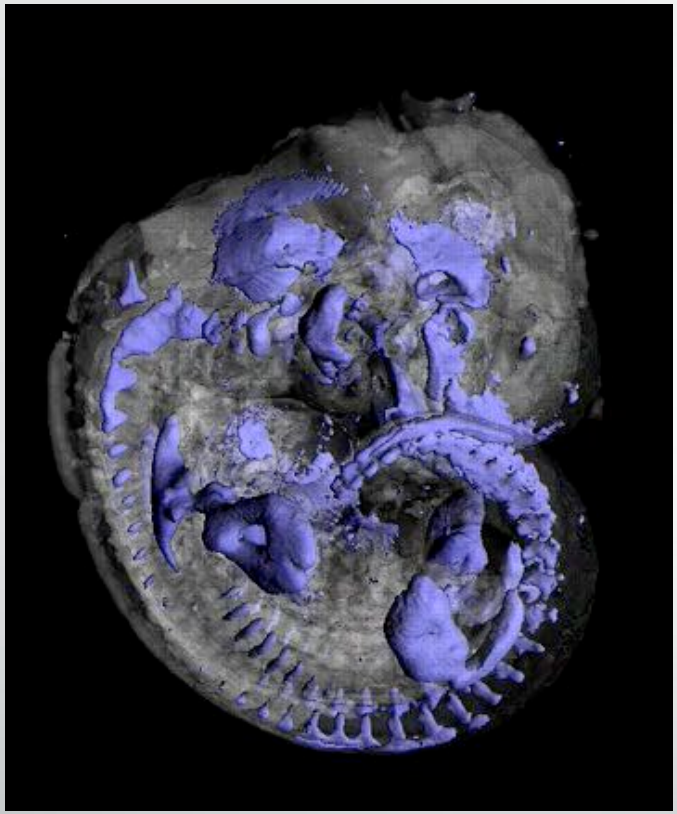
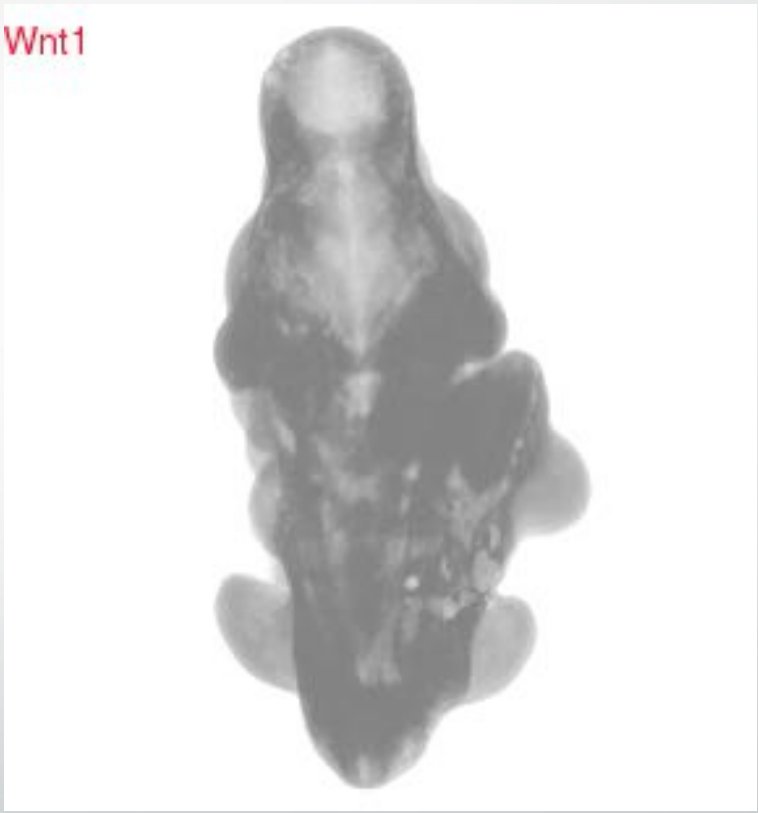
Biomedical Atlases: EMAP





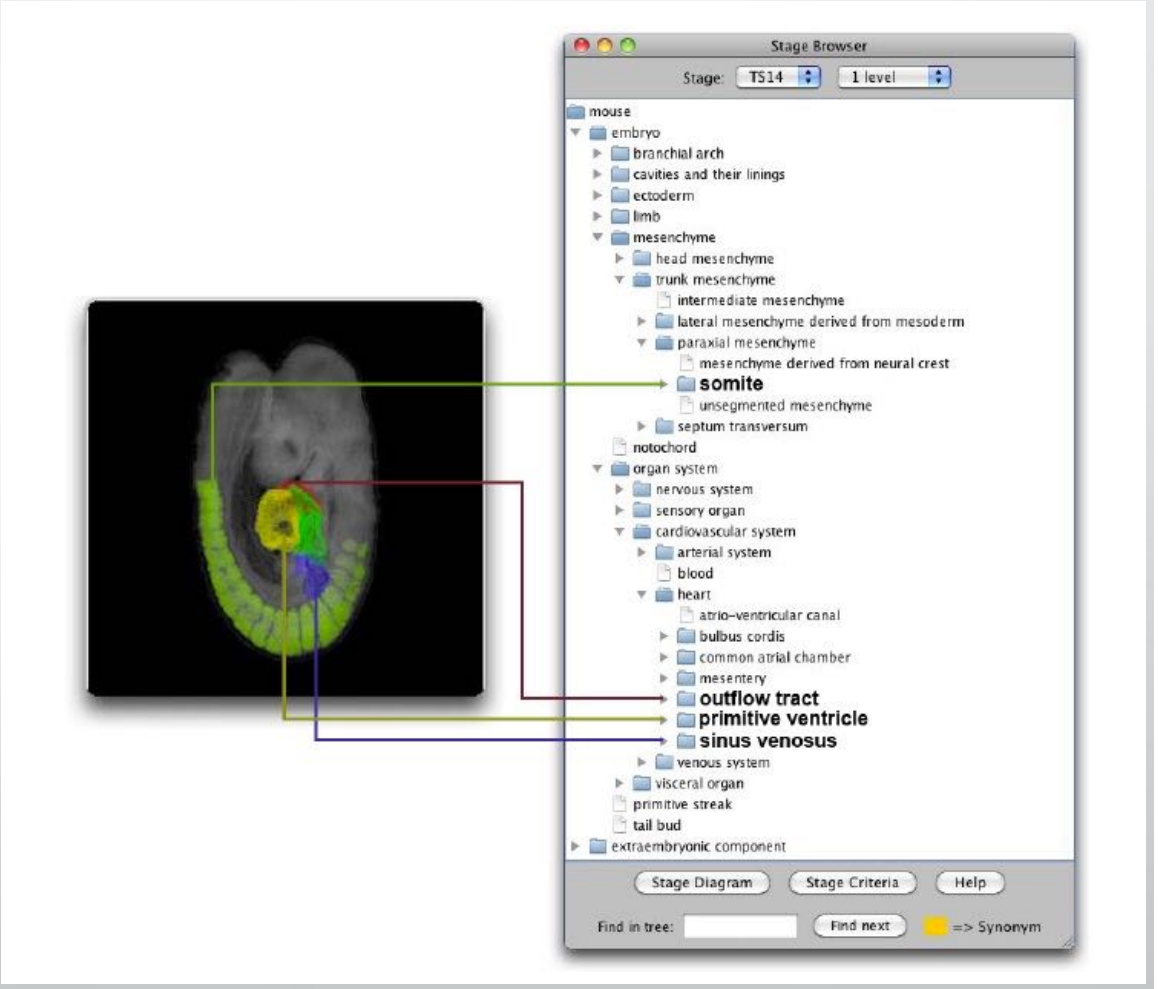
Biomedical Atlases: *Spatial Patterns*





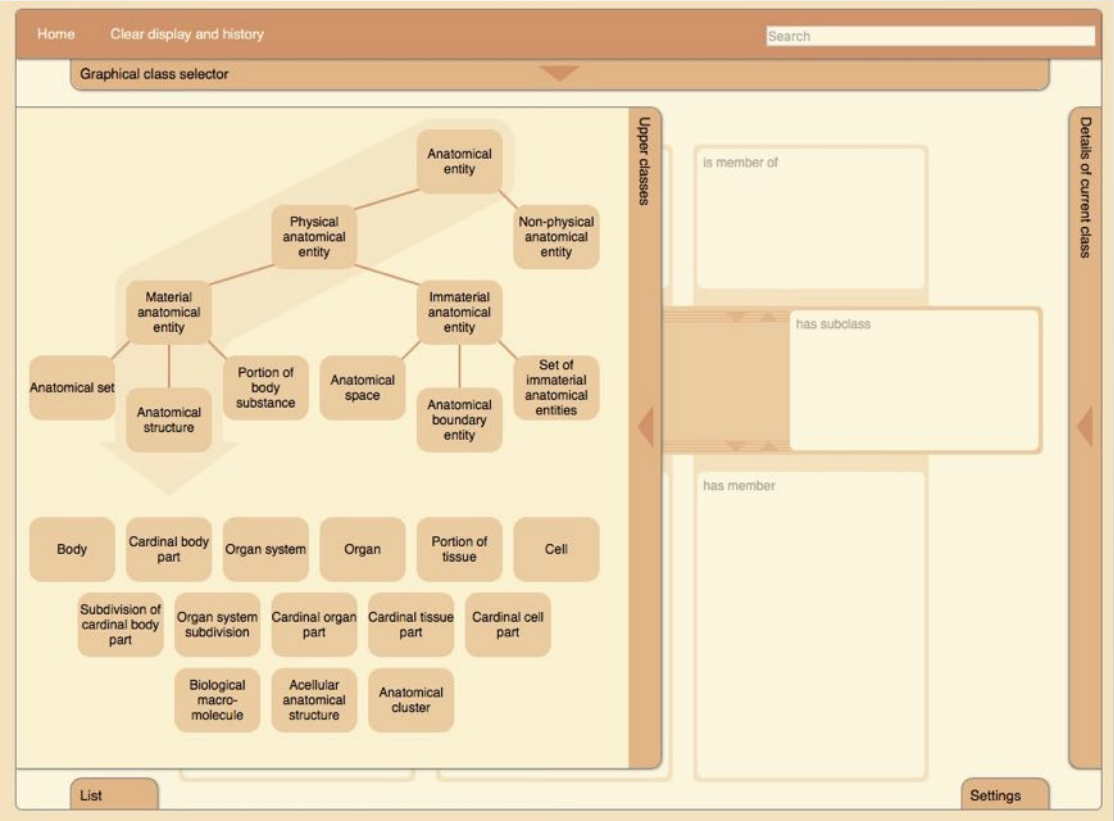
Anatomy Ontologies: EMAP

- EMAP
- www.emouseatlas.org
- Primarily a part-of hierarchy of anatomical structures for multiple developmental stages;



Anatomy Ontologies: FMA

- Foundational Model of Anatomy
- Human
- si.washington.edu/projects/fma



Anatomy Ontologies: BSPO

- Biological Spatial Ontology
- Spatial Descriptions
- www.ontobee.org/ontology/BSPO

Nose to tail, roots to shoots: spatial descriptors for phenotypic diversity in the Biological Spatial Ontology

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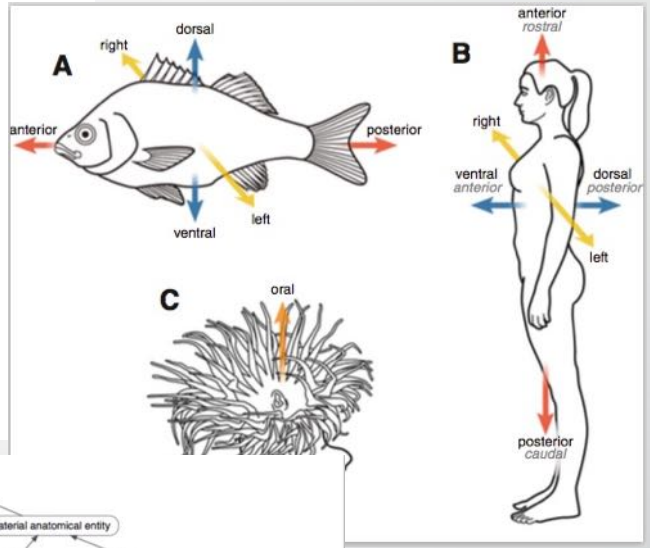
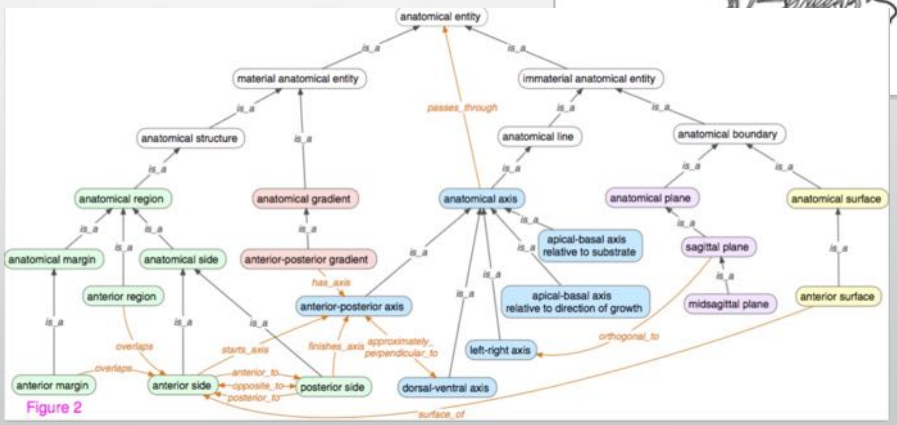


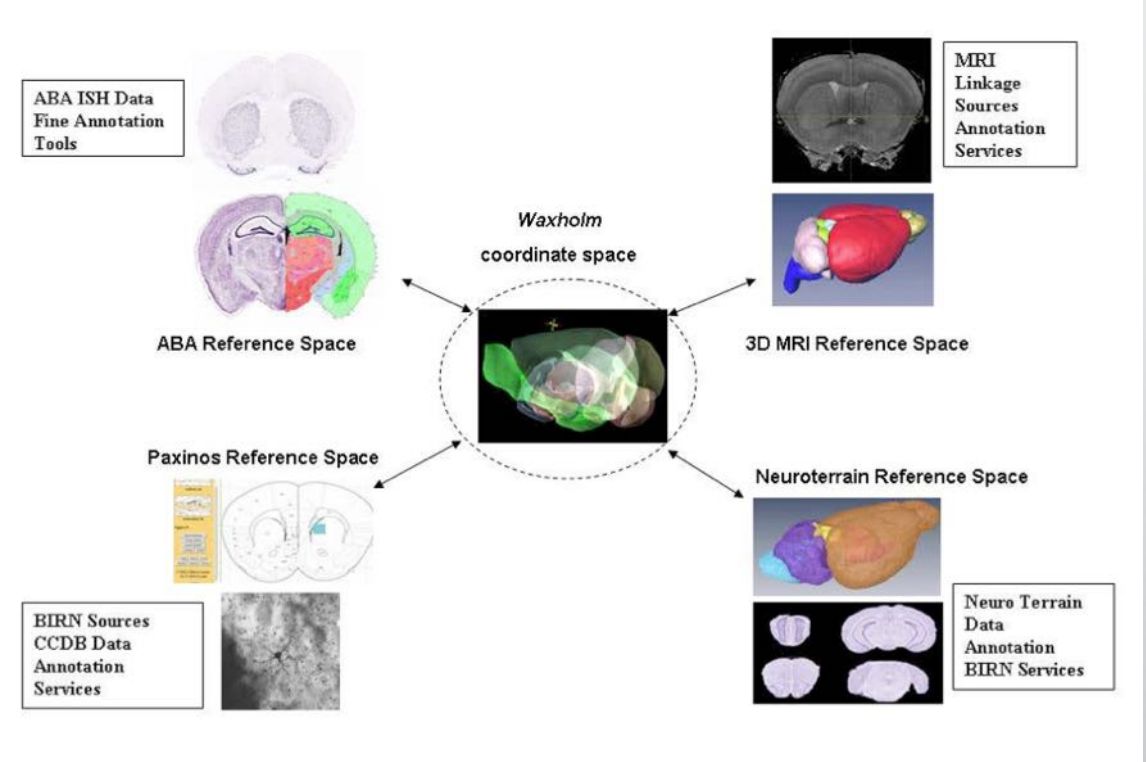


Images taken from above publication: http://dx.doi.org/10.1186%2F2041-1480-5-34

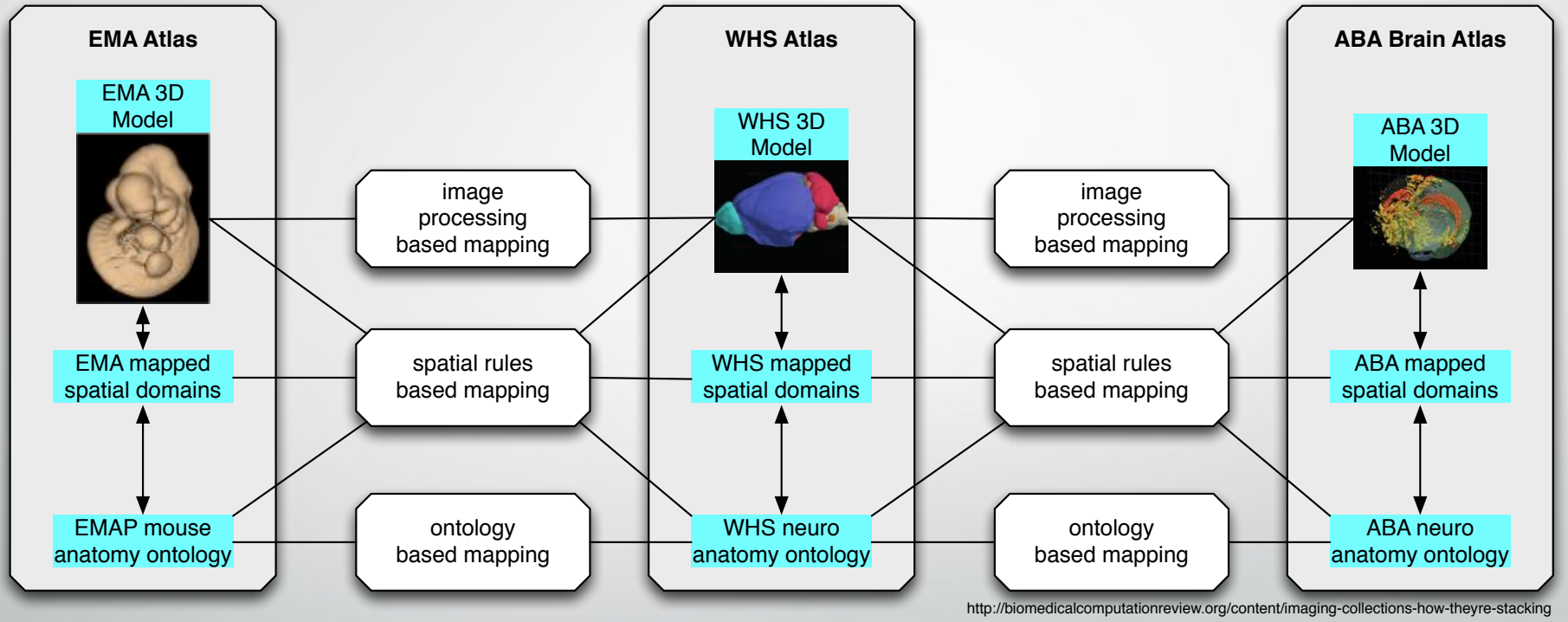
Atlas-based Data Integration

Waxholm Space (WHS)

(From: The INCF Digital Atlasing Program: Report on Digital Atlasing Standards in the Rodent Brain)



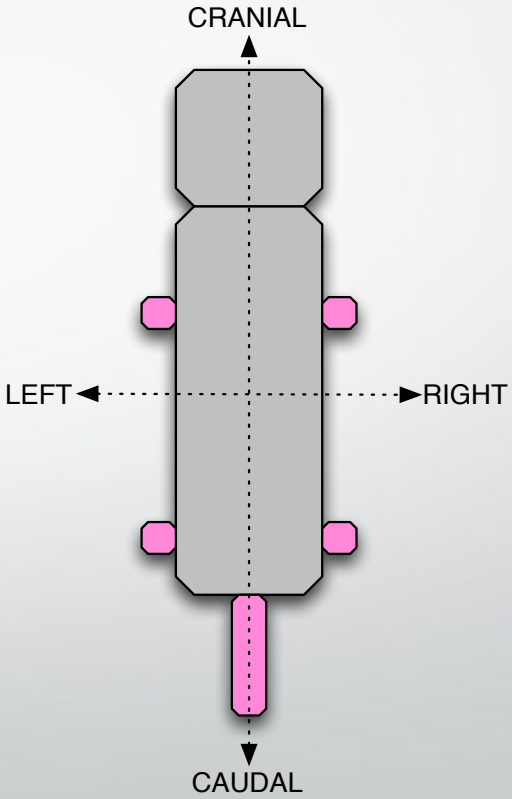
Atlas-based Data Integration



http://biomedicalcomputationreview.org/content/imaging-collections-how-theyre-stacking

The Straightened Mouse:

Cartesian vs Natural Coordinates



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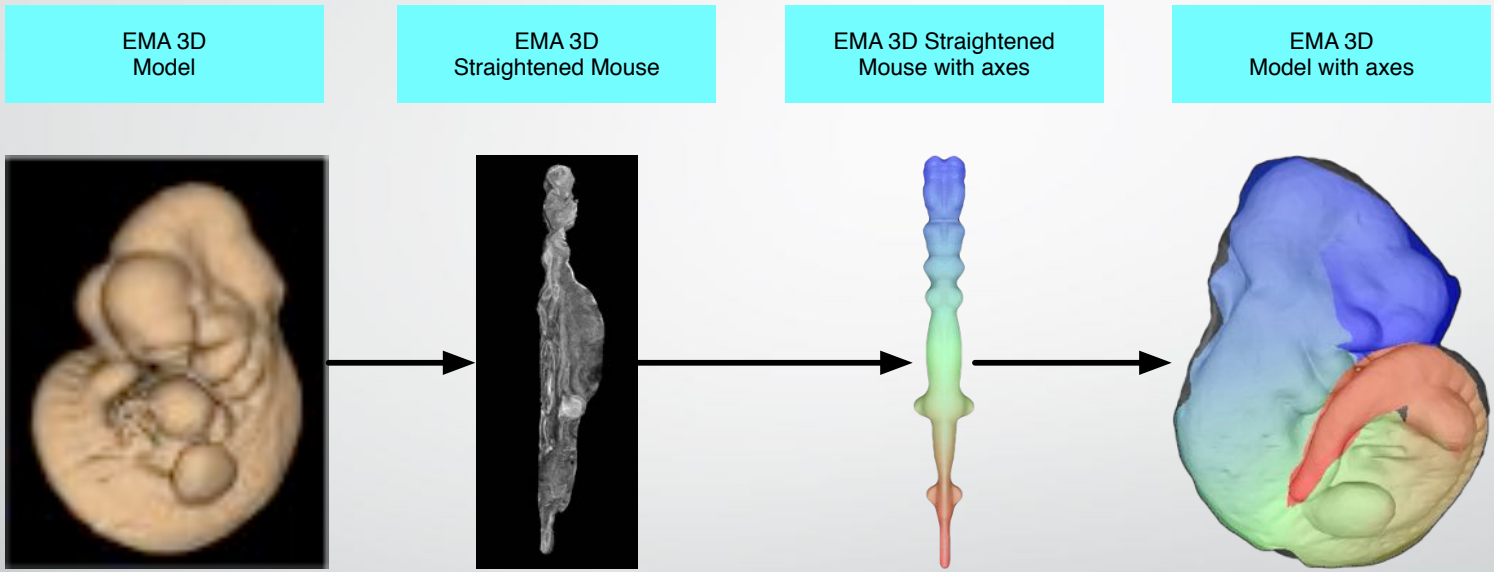

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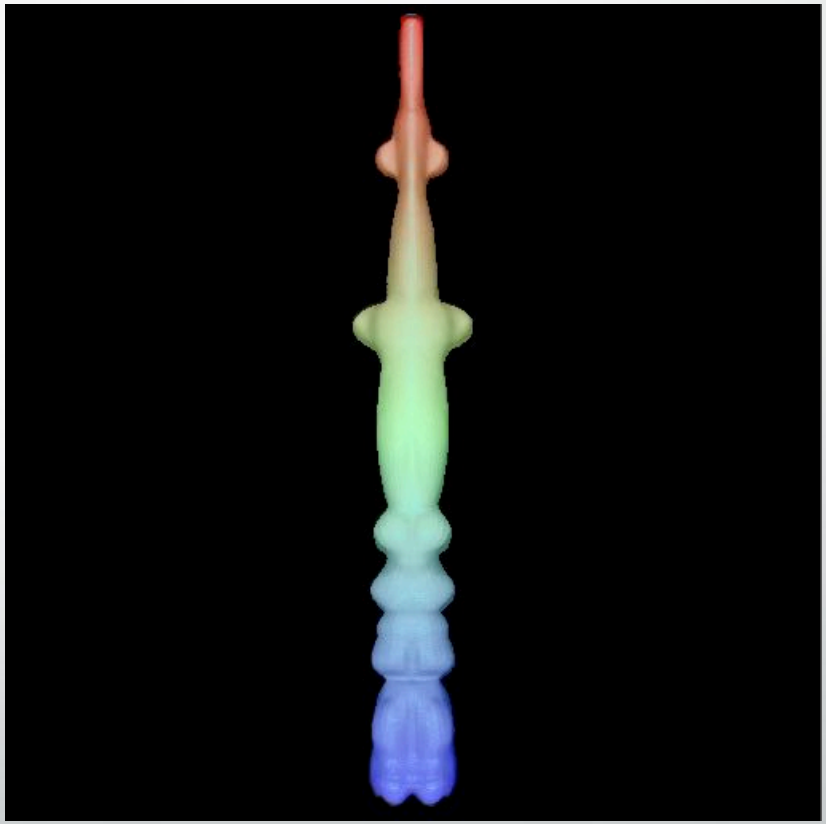

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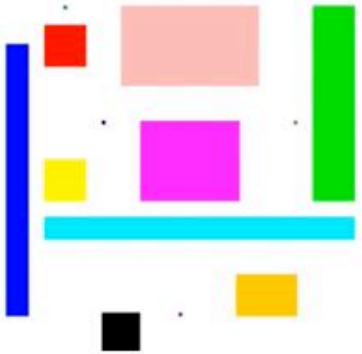
Superior



Inferior

BSPO semantics

One extremity of the block has a relationship to the same extremity of the ROI.

For example, *pink inferior ROI* means the most inferior point of pink is inferior to the most inferior point of the ROI.

All semantics

The entire block (every point) must have the same relationship to the ROI.

For example, *pink inferior ROI* means ALL of the pink block is inferior to the ROI.

Which semantics do you wish to use?

BSPO

Instructions

Build a spatial description using statements of the form: *colour* is *relationship* to ROI.

Click *add* to add your description to the list below.

The green block is superior to **ROI** Add

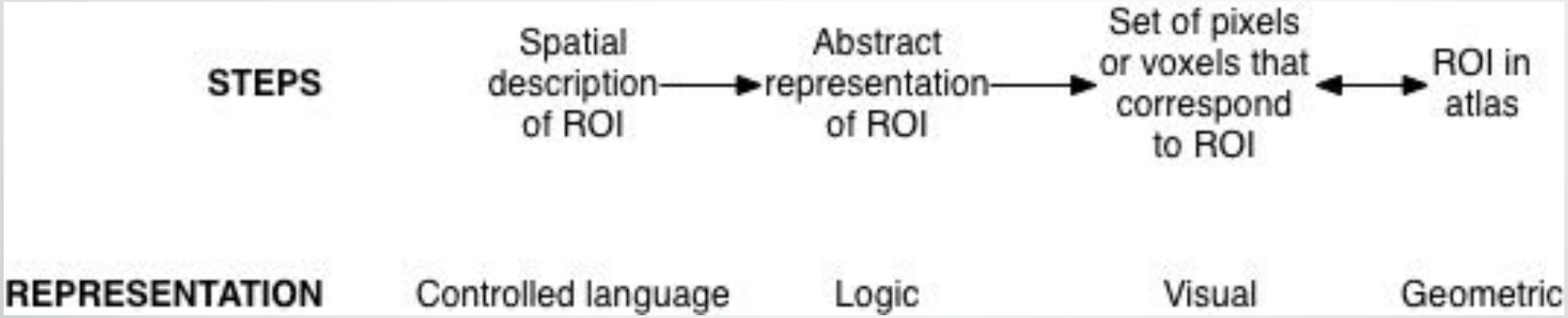
The blue point is left of **ROI** Add

Spatial Description you have built:

No description as yet; use the above form to create one.

reset submit

From Literature to Experimental Data



Ontological Challenges

- Standardisation of ontological to geometric space mapping
- What are the most effective spatial descriptions?
- Can we learn from human-to-human communication? (vs human-2-computer vs computer-2-computer)
- What are the best KR languages? (Prolog vs OWL vs ???)
- What are the best spatial reasoning solutions? (RCC vs ???)


Questions ?