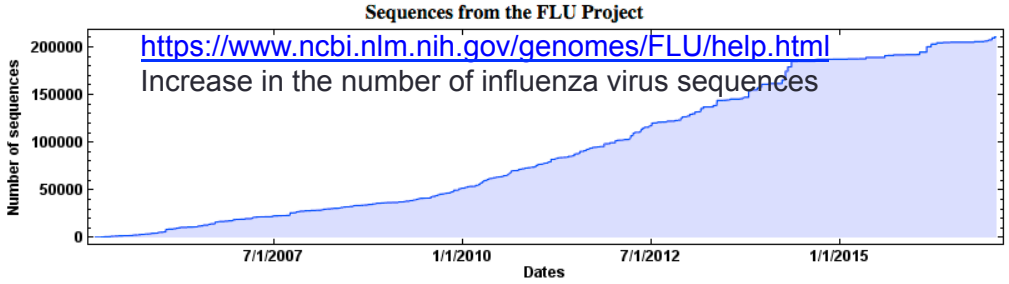
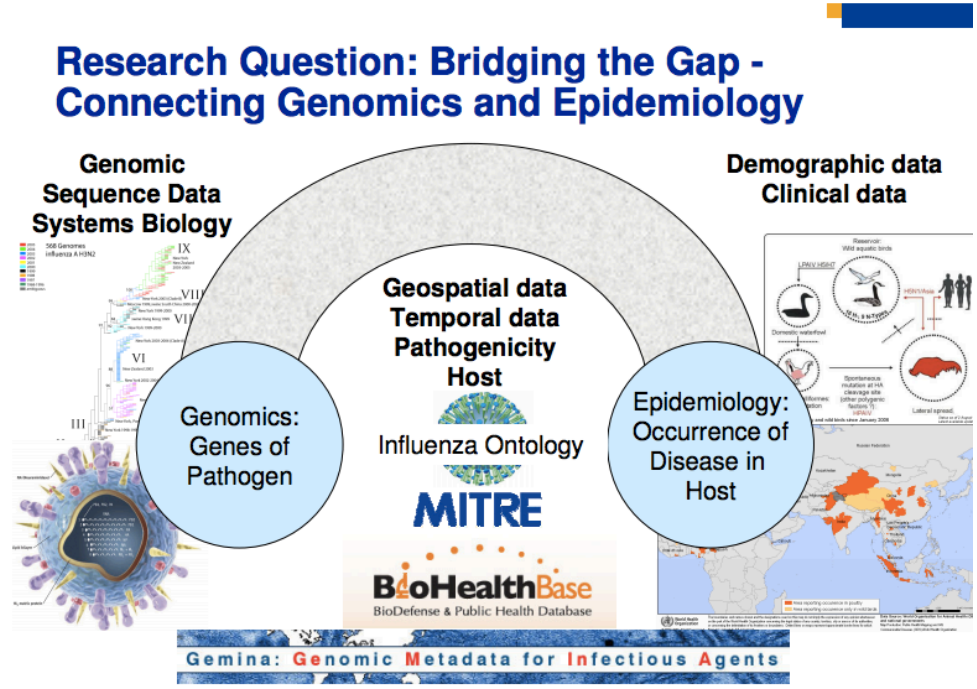
Influenza Ontology





Developed to support two use cases:

- Influenza Research
- Influenza Surveillance

Bridging the gap between

- genomic (molecular level)
- epidemiology level, (population level)

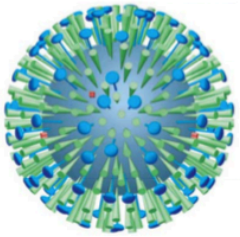
The ontology links “bird” and “avian” and the name of the species and type (duck, chicken”). This enables queries over GenBank data for “all cases of **avian** influenza.

http://www-test.ebi.ac.uk/industry/Documents/workshop-materials/DiseaseOntologiesAndInformation190608/The%20Influenza%20Infectious%20Disease%20Ontology%20(I-IDO)%20-%20Joanne%20Luciano.pdf

Influenza Ontology

Development Process

- Identify the right **collaborators**
- Collect **metadata terms**
- Identify **resources** for that include these terms
- **Regularize** metadata – Generate a **controlled vocabulary** (terms)
- **Validate** subset with BioHealthBase CEIRS data
- **Iterate, review** with community, publish
- **Integrate** (deploy) Influenza ontology into workflow

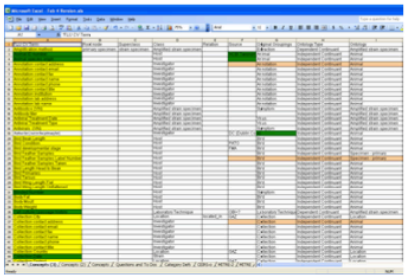


Influenza Ontology First Draft

Status: We have just started the formalization step.

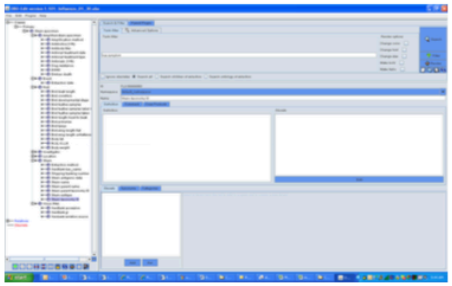
Initial steps:
- Collect metadata terms
- Map and align terms
- Group related information
- Identify and define relationships
- Identify external ontologies

Formalize:
- Normalize terms into a CV
- Issue unique identifiers
- Instantiate class hierarchy
- Define properties and values
- Link to external ontology terms



Excel Spreadsheet

Formalize



OBO-Edit: Ontology Editing Tool

MITRE

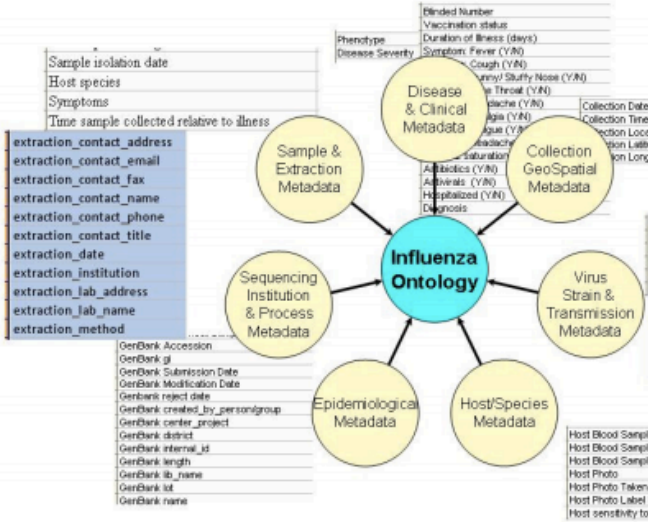
9

© 2008 The MITRE Corporation. All rights reserved

Application Ontology
Influenza Ontology

Reuse of existing ontologies & metadata standards

200 controlled vocabulary ter
covering several fields



- OBI – Ontology of Biomedical Investigations
- EnvO – Environmental Ontology (habitat of pathogen)
- GAZ – Gazeteer (geographic locations)
- FMA – Foundational Model of Anatomy
- DC – Dublin Core (publication metadata)
- PATO – Phenotype
- SO – Sequence Ontology (sequence features)
- Cell – Cell Ontology (types of cells)

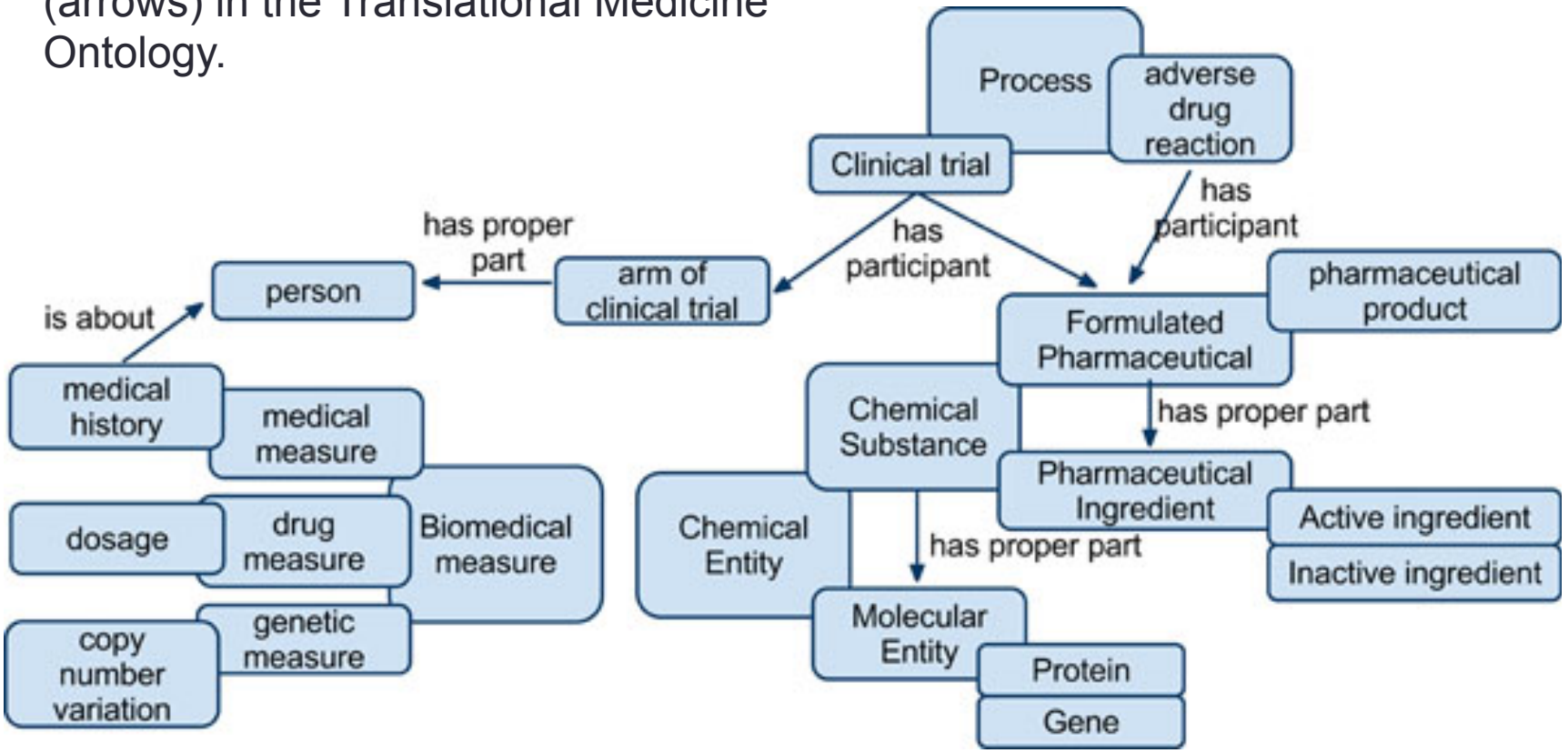
- DO – Disease Ontology
- IDO – Infectious Disease Ontology

http://www-test.ebi.ac.uk/industry/Documents/workshop-materials/DiseaseOntologiesAndInformation190608/The%20Influenza%20Infectious%20Disease%20Ontology%20(I-IDO)%20-%20Joanne%20Luciano.pdf

3

Translational Medicine Ontology

Overview of selected types, subtypes (overlap) and existential restrictions (arrows) in the Translational Medicine Ontology.

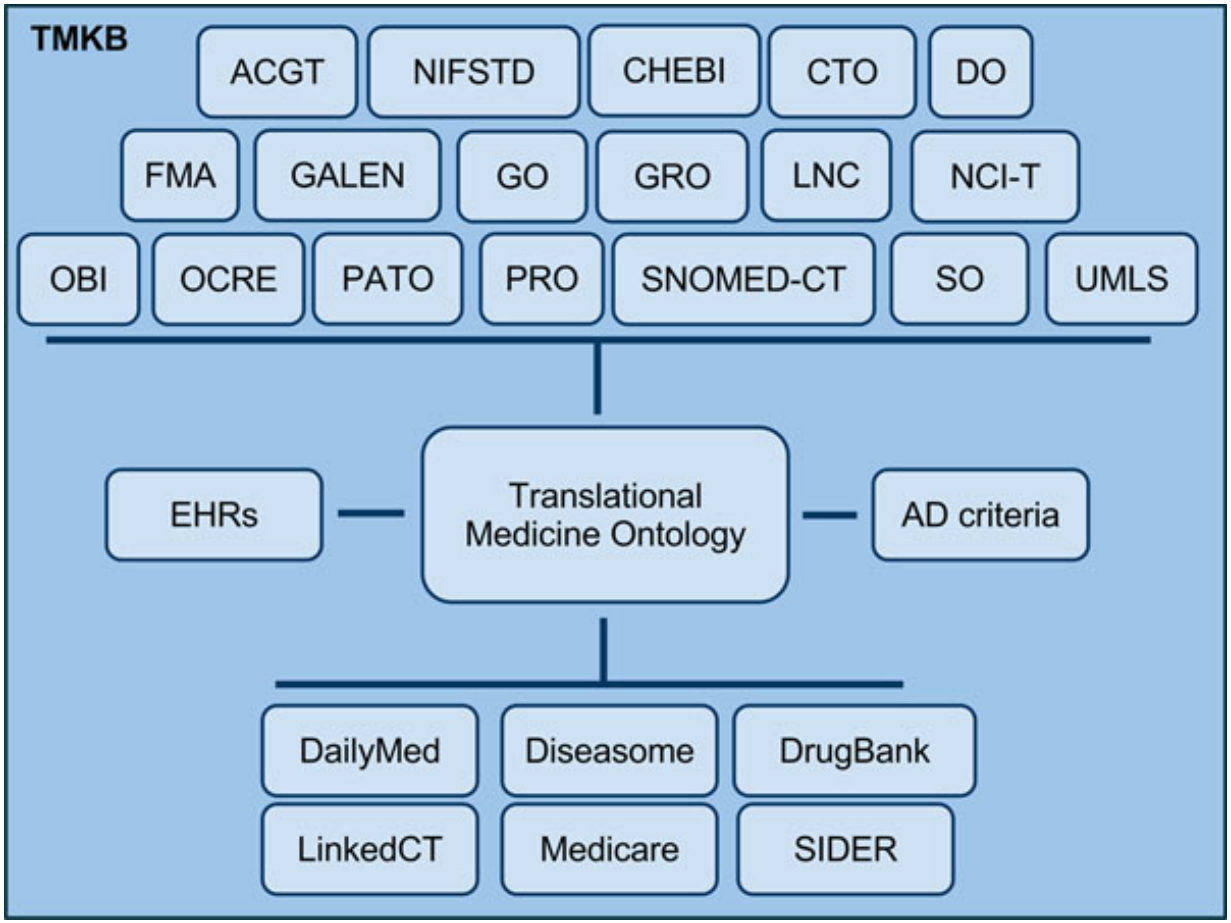


The Translational Medicine Ontology and Knowledge Base: driving personalized medicine by bridging the gap between bench and bedside
Luciano et al. Journal of Biomedical Semantics 2011, 2(Suppl 2):S1 http://www.jbiomedsem.com/content/2/S2/S1

Translational Medicine Knowledge Base

Translational Medicine Ontology with mappings to ontologies and terminologies listed in the NCBO BioPortal.

The TMO provides a global schema for Indivo-based electronic health records (EHRs) and can be used with formalized criteria for Alzheimer's Disease. The TMO maps types from Linking Open Data sources.



Best Practices

Semantic Web Methodology & Technology Development Process

Fox, Peter & McGuinness, Deborah 2008
http://tw.rpi.edu/web/doc/TWC_SemanticWebMethodology