

# IDO Extensions Alignment

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# Outline

- Goal: compare/align IDO core and IDO extensions
- Methods:
  - 3+1 ontologies: FLU, BO, IDOMAL & IDO core
  - OntoBee extension:
    - Web interface + RDF store + SPARQL + PHP
  - Tree structure display
  - Some basic statistics
- Demo of OntoBee/Compasion page
- Results

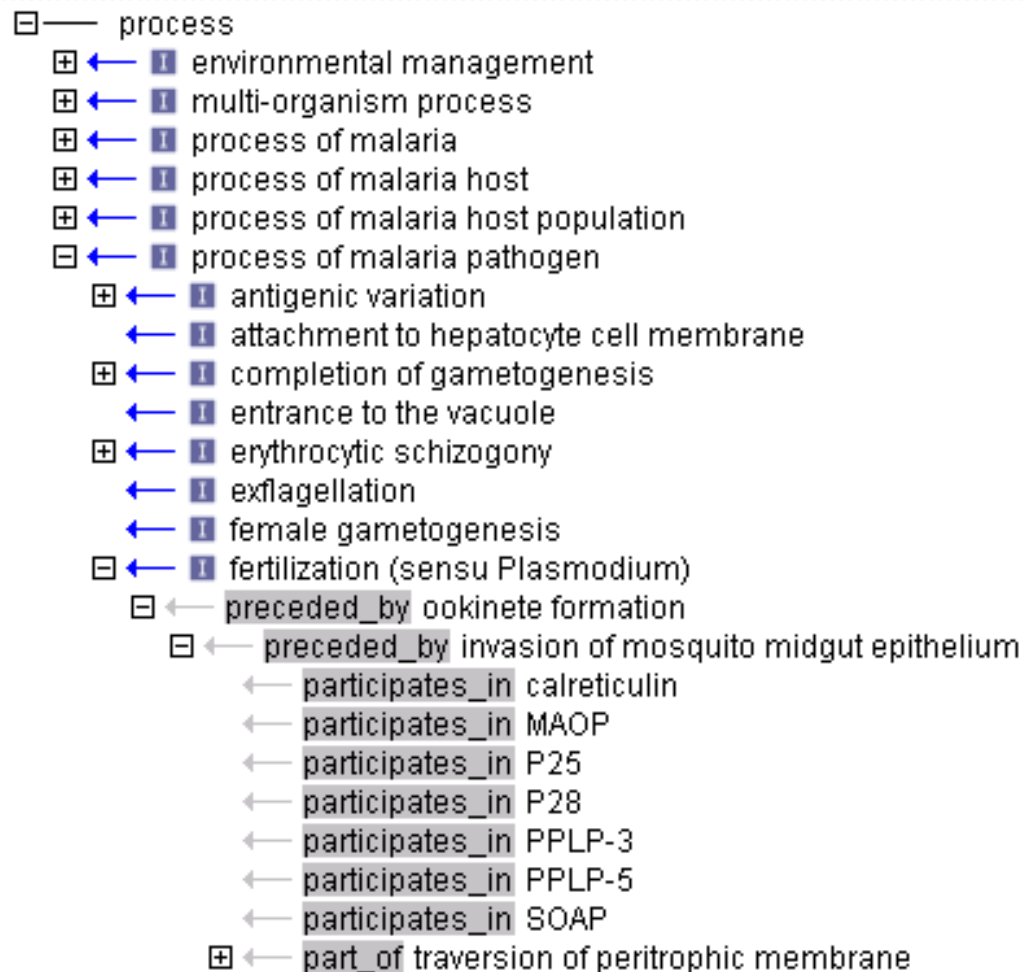
# Ontologies Compared

- IDO
  - <http://purl.obolibrary.org/obo/ido/2010-12-02/ido.owl>
- BO
  - <http://sourceforge.net/projects/bo-ontology/>
- FLU
  - <http://sourceforge.net/projects/influenzo/>
- IDOMAL
  - <http://anobase.vectorbase.org/idomal/IDOMAL.obo>
  - Converter: oboformat
- Retrieved on 12/5/2010

# Basic Characters

- IDOMAL vs FLU/BO
  - obo format vs. owl(RDF/XML)
    - Plain text vs. xml
  - OBO-Edit vs Protege
    - Structure glue: part\_of, participate\_in etc. vs. is\_a
  - Term mapping vs import
    - New IDs vs. imported IDs

# part\_of, participate\_in etc.



# IDOMAL in OBO-Edit

- IDOMAL has own IDs for all the root classes

- [-] Classes
  - [+] — condition
  - [+] — disposition
  - [+] — flat process part
  - [+] — object
  - [+] — object aggregate
  - [+] — process
  - [+] — process\_boundary
  - [+] — quality
  - [+] — role
  - [+] — spatial region
  - [+] — spatiotemporal region
  - [+] — temporal region
- [+] Relations
- [+] Obsolete

# IDOMAL in Protege

- Many terms do not have asserted/inferred parents

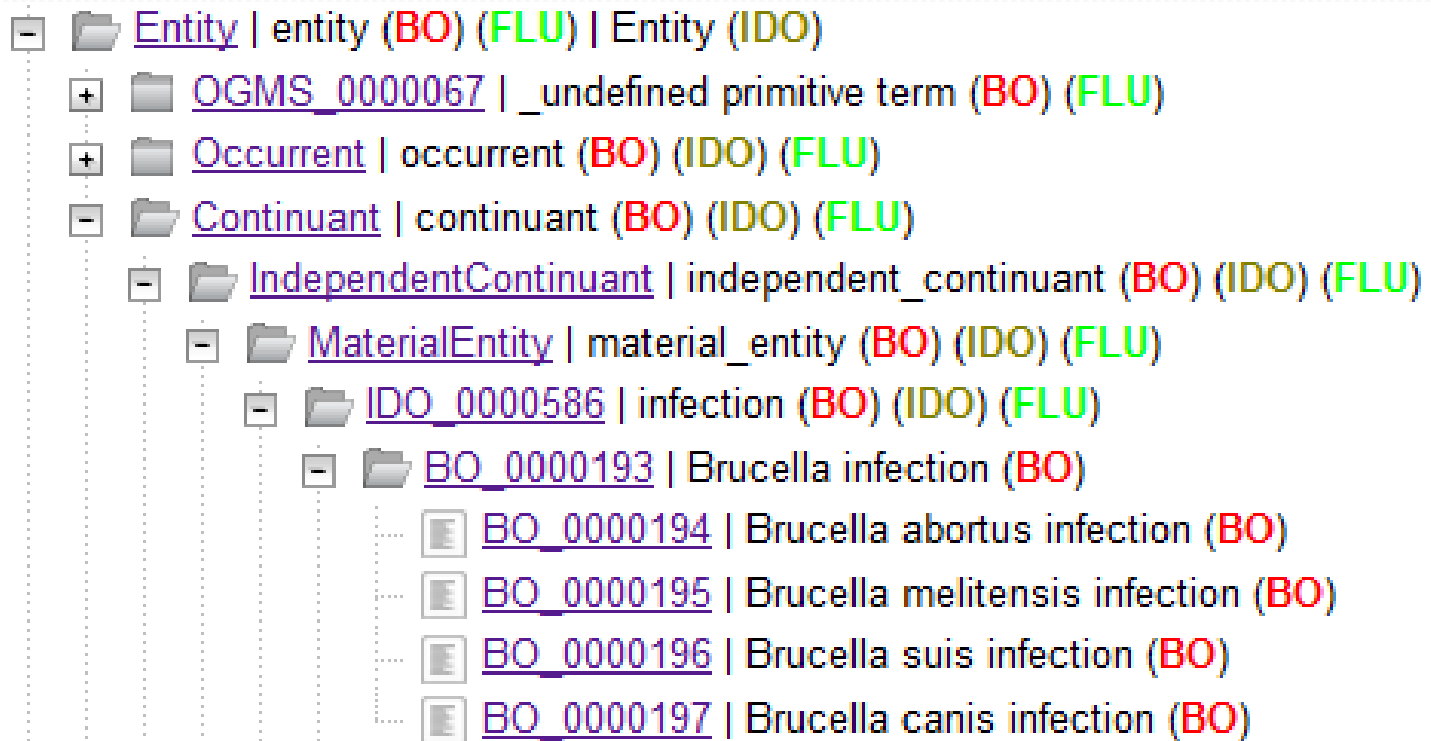
Thing

- 'CD4-positive, alpha-beta T cell receptor recognition'
- 'CD8-positive, alpha-beta T cell receptor recognition'
- 'COE qualitative change'
- 'COE quantitative change'
- 'Certification of malaria eradication by WHO'
- 'GST qualitative change'
- 'GST quantitative change'
- 'P450 qualitative change'
- 'P450 quantitative change'
- 'Plasmodium adherence to host cell'
- 'absorption of the products of digestion'
- activation
- 'adult responses to visual stimulus'
- 'approach of oviposition site'
- 'artificial discarded container'
- 'assignment of accommodation'
- 'assignment of storage facilities'
- 'attachment to basal lamina'
- 'attack phase of malaria eradication'
- 'biological mosquito control'
- 'brackish water'
- 'chemical transformation'
- chemoprophylaxis
- condition
- 'consolidation phase of malaria eradication'
- 'deficiency of midgut receptor'
- 'deposition of the new cuticle'
- 'development of competence to respond to host cue'
- 'development of sporozoite'
- 'diel periodicity of sugar feeding'
- disposition
- 'drainage ditch'
- ecdysis
- 'effect of 20-hydroxyecdysone'
- 'effect of insemination'
- 'effect of insemination in the adult circadian rhythm'
- 'effect of simulated crepuscular conditions and moonlight'
- 'elevated AChE levels'
- engulfment
- 'engulfment by nonphagocyte'
- 'engulfment by phagocyte'
- 'expansion of cuticle'
- 'fat body factor'

- 'fiat process part'
- 'flight patterns in swarms'
- 'flower visiting'
- 'flowing water in canal'
- 'flowing water in ditch'
- 'free-running of rhythm'
- 'geographical reconnaissance of the area'
- 'hardening and darkening of cuticle'
- 'hardening and darkening of the chorion'
- 'histological change'
- histolysis
- 'hormone secretion'
- 'human population of immune individuals'
- 'human population of non-immune individuals'
- 'identification and numbering sprayable houses/structures'
- 'inhibition of invasion'
- 'inhibition of sequestration'
- 'initiation of infection'
- insemination
- 'invasion of epithelium'
- 'invasion of salivary gland'
- 'large open marsh'
- 'late phase'
- 'macrogamete stage'
- 'maintenace phase of malaria eradication'
- 'malaria pathogen'
- 'malaria prevention in individuals'
- 'male fecundity'
- 'marshy part of lake'
- 'mating in resting sites'
- 'maturation of sporozoite in salivary gland'
- 'membrane invagination'
- 'microgamete stage'
- 'migration to salivary gland'
- 'modified AChE'
- 'modified GABA receptor'
- 'modified midgut protease activity'
- 'modified midgut receptor'
- 'modified nicotinic receptor'
- 'modified sodium channel'
- 'modulation of host immune response'

# Ontologies Alignment

- <http://www.ontobee.org/compare/index.php>





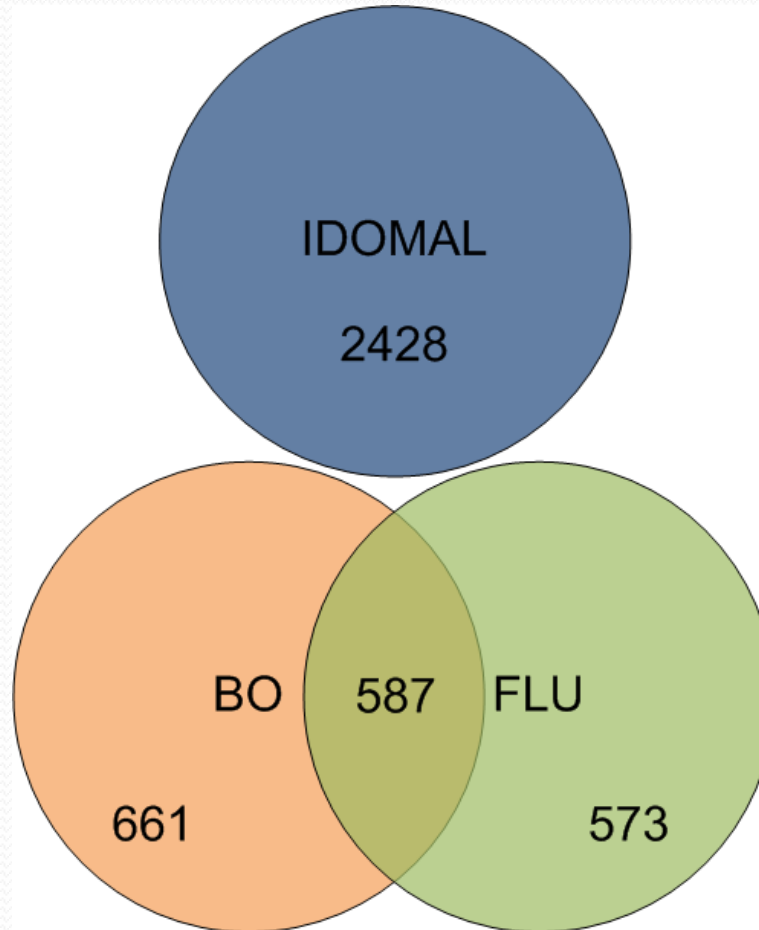
# Term Statistics

Ontology	Number of terms (including imported)	Number of terms (excluding imported)
IDO	612	414
BO	1302	446
FLU	1221	315
IDOMAL	2442	1420

- Terms shared by BO, FLU and IDOMAL: 0
  - Terms shared by BO & FLU (minus 5): 587
  - Terms shared by BO & IDOMAL (minus 5): 0
  - Terms shared by FLU & IDOMAL (minus 5): 0
- Terms shared by IDO & IDOMAL: 0

Online at <http://www.ontobee.org/compare/stat.php>

# Venn Diagram



# Terms with Duplicate IDs

- **virulence:** IDO\_0000466; IDOMAL\_0000004;
- **immune response:** GO\_0006955; IDOMAL\_0002357;
- **population:** OBI\_0000181; IDOMAL\_0001254;
- **anatomical entity:** CARO\_0000000; OBI\_0100015;
- **organism:** OBI\_0100026; IDOMAL\_0000640;
- **infectious disease:** IDO\_0000436; IDOMAL\_0001051;
- **pathogen:** IDO\_0000528; IDOMAL\_0000063;
- **vaccine:** VO\_0000001; IDOMAL\_0000262;
- **protein complex:** GO\_0043234; IDOMAL\_0000732;
- **host exposure to infectious agent:** IDO\_0000594; IDO\_0000658;
- **protein:** PRO\_000000001; IDOMAL\_0001067;
- **B cell receptor complex:** GO\_0019815; IDOMAL\_0000064;
- **host:** IDO\_0000531; IDOMAL\_0000055;
- **enzyme:** OBI\_0000427; IDOMAL\_0000729;
- **author role:** IAO\_0000442; FLU\_0000899;
- **disposition:** <http://www.ifomis.org/bfo/1.1/snap#Disposition>; IDOMAL\_0001050;
- **object:** <http://www.ifomis.org/bfo/1.1/snap#Object>; IDOMAL\_0000003;
- **quality:** <http://www.ifomis.org/bfo/1.1/snap#Quality>; IDOMAL\_0000002;
- **role:** <http://www.ifomis.org/bfo/1.1/snap#Role>; IDOMAL\_0000001;
- **process:** <http://www.ifomis.org/bfo/1.1/span#Process>; IDOMAL\_0000000;
- **process\_boundary:** <http://www.ifomis.org/bfo/1.1/span#ProcessBoundary>; IDOMAL\_0002437;
- **doxycycline:** BO\_0000113; IDOMAL\_0000229;
- ..... (76 in total)

# IDO Terms w/ Child in BO or FLU

1. IDO\_0000568: zoonosis
2. IDO\_0000547: virulence factor
3. IDO\_0000460: infected host
4. IDO\_0000460: infected organism
5. IDO\_0000453: zoonotic disposition
6. IDO\_0000562: antibiotic
7. IDO\_0000425: virulence factor disposition
8. IDO\_0000586: infection
9. IDO\_0000495: infectious disease course
10. IDO\_0000405: pathogen role
11. IDO\_0000436: infectious disease
12. IDO\_0000508: virion
13. IDO\_0000559: antiviral
14. IDO\_0000603: process of establishing an infection

# Acknowledgements

- IDO
- OBI
- FLU
- IDOMAL
- BO