

# **PHAC/CIHR Influenza Research Network**

**NCBO/IDO workshop**  
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# PCIRN mission

- Canadian national network of key influenza vaccine researchers.
- Develops and tests methodologies/methods related to the evaluation of pandemic influenza vaccines as they pertain to safety, immunogenicity and effectiveness, and program implementation and evaluation.
- <http://www.pcirn.ca/>

# PCIRN structure

- Theme I: Rapid Trials
- Theme II: Rapid Implementation
- Theme III: Vaccine Coverage
- Theme IV: Vaccine Safety
- Theme V: Vaccine Effectiveness
- + support groups

More than 90 investigators across 30 institutions

# IT support group

- Aim: to standardize data (same variables, same coding) and to assure the use of standard validated definitions – if possible from an ontological resource.
- Objective is to ensure data quality and consistency across the network.

# Standardization

- Determine controlled vocabulary
- **Minimum Information:** checklist to identify gap
- Identify existing ontologies terms supporting the network, and contribute to/develop resources as needed

# Ontologies

- Areas addressed: Demographics, Lab shipping and results information, Vaccine details, Exposure, Specificity
- Existing relevant resources: IDO (Influenza and Vaccine Ontology), OBI (Ontology for Biomedical Investigations), OGMS (Ontology for General Medical Science)...

# Neuraminidase typing

- FLU\_0000779, “An assay which aims at determining the neuraminidase type of an influenza virus”

**assay** (OBI\_0000070) and (*has\_specified\_output* some

('measurement datum' (IAO\_0000409) and ('is about' some **neuraminidase** (FLU\_0000753))))

# Influenza Ontology

- **Influenza neuraminidase** (FLU\_0001034) is\_a neuraminidase (FLU\_0000753) part\_of some **Influenza virion** (FLU\_0000751)
- Influenza virion is\_a **virion** (IDO\_0000508)
- Neuraminidase is\_a **protein** (PRO\_000000001) which *has\_function* some **catalytic activity** (GO\_0003824)
- Influenza neuraminidase is\_a **enzyme** (OBI\_0000427)



# Viral RNA extraction

- **viral RNA extraction** (FLU\_0000829) is\_a **RNA extraction** (OBI\_0666666)
- *has\_specified\_input* some **Viruses** (NCBITaxon\_10239)
- *has\_specified\_output* some **ribonucleic acids** (ChEBI\_33697)
- [...] **sequencing assay** (OBI\_0600047) [...] GenBank submission

# Vaccine Ontology

- Canadian vaccines information
  - Manufacturer
  - Vaccine type (eg inactivated)
  - Adjuvant, preservatives
  - Potential allergens
  - Route of administration
  - Dose information
  - ...

# Vaxigrip

- *has\_part* **neomycin** (ChEBI\_44577) and (*has\_role* some 'vaccine allergen role')
- *has\_part* thimerosal vaccine preservative
  - 'vaccine additive' and (*has\_role* some 'vaccine preservative role')
  - *has\_part* some **thimerosal** (ChEBI\_9546)
- **Intramuscular injection** (OBI\_0000934) (through **skeletal muscle tissue** (FMA\_14069))
- [...]

# VO – Vaccine Ontology

The screenshot displays the Vaccine Ontology (VO) web interface. The browser address bar shows the URL <http://purl.obolibrary.org/obo/vo.owl>. The search bar contains the text "multi-". The interface is divided into two main panels.

**Left Panel: Class hierarchy**

Class hierarchy: 'multi-dose Vaxigrip'

- Arepanrix
- FluLaval
- FluMist
- Fluarix
- 'Fluviral S/F'
- Fluvirin
- Fluzone
- 'H1N1 Influenza vaccine'
- 'Influenza virus DNA vaccine e
- 'Influenza A (H1N1) 2009 Mor
- 'Influenza A (H1N1) 2009 Mor
- 'Influenza A (H1N1) 2009 Mor
- 'Influenza A (H1N1) 2009 Mor
- 'Influenza Virus Vaccine H5N1
- 'Influenza virus DNA vaccine e
- 'Influenza virus DNA vaccine e
- 'Influenza virus DNA vaccine e
- 'Influenza virus NP protein va
- Influvac
- Intanza
- 'Intervet Avian Influenza virus
- Panvax
- 'Poulvac FluFend I AI H5N3 RC
- 'Recombitek (United States)'
- 'Trovac AI H5'
- ▼ ● Vaxigrip
  - 'multi-dose Vaxigrip'
  - 'single-dose Vaxigrip'
- 'inactivated influenza vaccine'
- 'live attenuated influenza vaci

**Right Panel: Description: 'multi-dose Vaxigrip'**

**vaxigrip**

- has\_part some 'thimerosal vaccine preservative'

Inherited anonymous classes

- material\_entity
  - and (is\_specified\_output\_of some 'material processing')
- 'processed material'
  - and (has\_function some 'vaccine function')
  - and (is\_specified\_output\_of some 'vaccine preparation')
- 'viral vaccine'
  - and (administered\_to\_prevent some ('unidentified influenza virus' or 'Influenzavirus A' or 'Influenzavirus B' or 'Influenzavirus C'))
- has\_quality some inactivated
- is\_manufactured\_by some 'Sanofi Pasteur Limited'
- has\_part some formaldehyde
- bearer\_of some 'licensed human vaccine in Canada role'
- has\_part some (neomycin and (has\_role some 'vaccine allergen role'))
- is\_specified\_input\_of some (vaccination and (has\_specified\_input some ('Homo sapiens' and (has\_role some 'host role'))))
- has\_route\_specification some 'intramuscular route'
- has\_part some 'whole organism in vaccine'
- vaccine

# Advantages of using IDO

- Less work for me
- Common infrastructure
- Collaborative platform
- Set of resources following similar guidelines and development principles

# Thank you

- OBI, IAO, OGMS and IDO teams
- OBO Foundry
- PHAC/CIHR Influenza Research Network

