Ontorat Web Server for Automatic Ontology Term Generation and Annotations

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- **Needs:** Often we need to (1) create a large number of new ontology terms or (2) annotate existing terms, that follow the same design patterns of logical definitions and axioms.
- **Challenge:** Manual addition of these terms is time consuming, error prone, and often boring.
- **Goal:** Ontorat is developed to facilitate this process.

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Ontorat Design and Implementation

Development Strategy:

- Developed based on Ontology Design Patterns
- Inspired by OBI Quick Term Templates (QTT)
- Implement OBI QTT procedure
- No RDF store used
- Web-based user interface

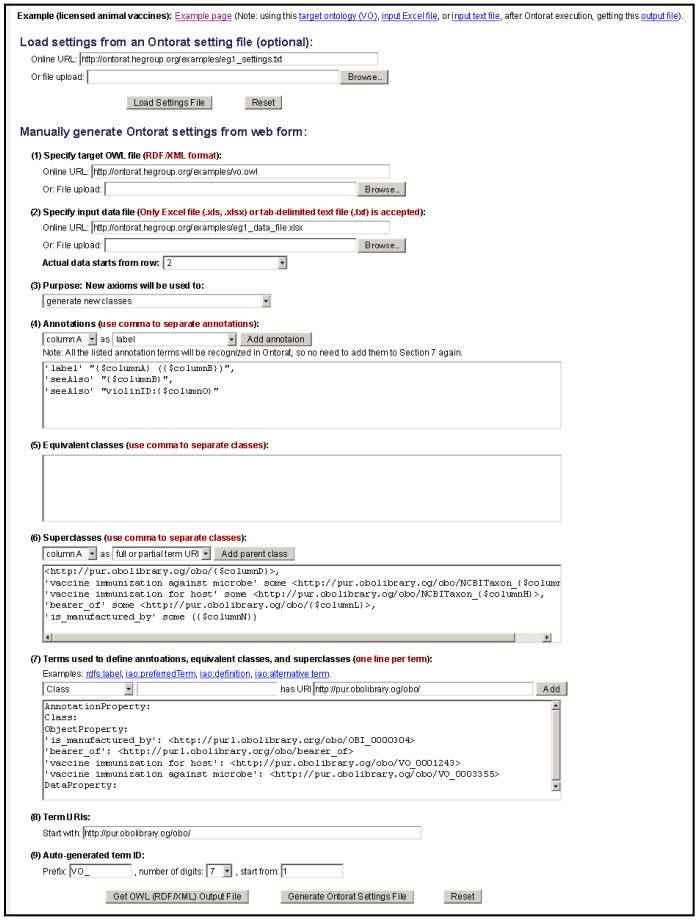
Needs Three Parts for Execution:

1) Target ontology → to avoid ID duplication
2) Input data file: Excel or tab-delimited text form
3) Setting scripts → use Manchester OWL Syntax
   (note: settings can be stored and reused)

Output Results:

- OWL or Manchester syntax output file
- Can be imported/merged to target ontology using Protege-OWL editor

Ontorat Web Interface:



http://ontorat.hegroup.org

Use case study

- Use Ontorat to generate new vaccine terms in Vaccine Ontology (VO)
- Automatically created new VO terms for ~800 licensed vaccines
- **<u>Advantages</u>:**
  quick, user-friendly, scalable, robust, save/reuse templates.

VaccineOntology

(A) Specify target ontology

	A	B	C	D	E	F	G
1	Vaccine name	USDA ID	Parent term label	Parent term ID	Pathogen name	Pathogen	Host name la Host (
2	Pigeon Pox Live Virus Vaccine	USDA: 1881.10	Pigeonpox virus vaccine	VO_0001481	Pigeonpox virus	10264	Birds
3	Fox Encephalitis Killed Virus Vaccine	USDA: 1635.20	Canine adenovirus type 1 vaccine	VO_0001489	Canine adenovirus 1	10512	Carnivores
4	Feline calicivirus Killed Virus Vaccine	USDA: 15C5.21	Feline calicivirus vaccine	VO_0001509	Feline calicivirus	11978	Cat
5	Anthrax Spore live culture Vaccine	USDA: 1011.00	Bacillus anthracis vaccine	VO_0000013	Bacillus anthracis	1392	Cattle
6	Avian Encephalomyelitis Killed Virus Vaccine	USDA: 1015.I0	Avian Encephalomyelitis Virus vaccine	VO_0001522	Avian encephalomyelitis	70796	Chicken
7	Duck Virus Hepatitis Modified Live Virus Vac	USDA: 14B1.10	Duck hepatitis virus 1 vaccine	VO_0001528	Duck hepatitis A virus	691956	Ducks
8	Flavobacterium Columnare Avirulent Live Cu	USDA: 17F1.00	Flavobacterium columnare vaccine	VO_0000637	Flavobacterium columnar	996	Fish
9	Bordetella Bronchiseptica Avirulent Live Cul	USDA: 1081.00	Bordetella bronchiseptica vaccine	VO_0000394	Bordetella bronchiseptica	518	Gray wolf
10	Equine Influenza Killed Virus Vaccine	USDA: 1505.10	Influenza virus vaccine	VO_0000642	influenza virus	11309	Horse
11	Erysipelothrix Rhusiopathiae Avirulent Live (	USDA: 1541.00	Erysipelothrix rhusiopathiae vaccine	VO_0001456	Erysipelothrix rhusiopathi	1648	Pig
12	West Nile Virus Killed Virus Vaccine	USDA: 1995.20	West Nile virus vaccine	VO_0000752	West Nile virus	11082	sei whale
13	Bluetongue Modified Live Virus Vaccine	USDA: 1061.00	Bluetongue virus vaccine	VO_0001515	Bluetongue virus	40051	Sheep
14	Bordetella Avium Avirulent Live Culture Vacc	USDA: 1021.01	Bordetella avium vaccine	VO_0001114	Bordetella avium	521	Turkey
15	Escherichia Coli Avirulent Live Culture Vaccir	USDA: 1551.02	Escherichia coli vaccine	VO_0000041	Escherichia coli	562	Turkey
16	Porcine Circovirus Type 2, Killed Baculovirus	USDA: 19K5.R0	Porcine circovirus 2 vaccine	VO_0001524	Porcine circovirus 2	85708	Pig

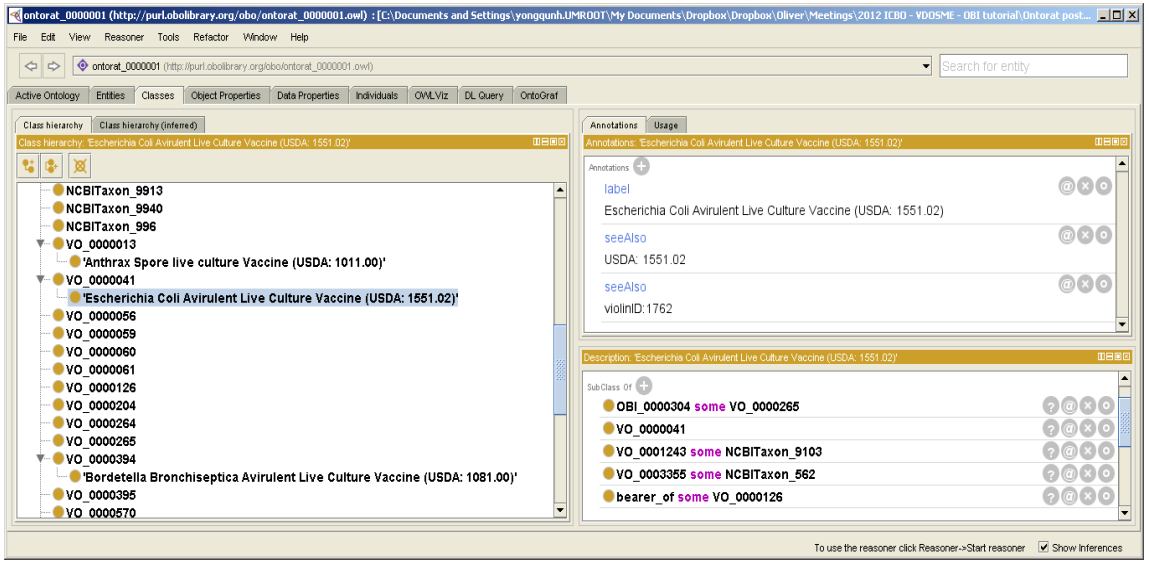
(B) Specify input data file (in Excel or tab-delimited text)

(C) Generate settings using Manchester syntax

Retrieving Results

Finished the Ontorat execution. Please download the output file.

(D) Execute and retrieve output OWL file



(E) OWL output d**isplayed and merged to target ontology using Protege.**