

POSITION: Post-Doctoral Research Fellow  
DESIRED START DATE: December 15<sup>th</sup> 2019, or as soon as possible  
TERM LENGTH: 12 months

#### PROJECT DESCRIPTION:

Are you interested in applying your knowledge in food science and nutrition to transform how we practice public health and agriculture? As exchanging data and information becomes easier with digital technologies, the lack of a digital lingua franca is obvious in the domain of human food as materials travel from their wild or farm origin, through processing and distribution chains, to consumers. The candidate will participate in the design of the semantic knowledge framework of the recently launched USDA Agricultural Research Service FoodData Central (<https://fdc.nal.usda.gov>). We will use semantic web and ontologies as the technology backbone and apply recently launched FoodOn (<http://FoodON.org>) farm-to-fork food vocabulary system to organize FoodData Central. Vocabulary curation will involve a focus on food categorization and nutritional analysis modeling. In addition, the candidate will learn to develop and implement scripts for integrating our FoodOn with resources like Wikipedia, WikiData, and multi-lingual AGROVOC vocabulary to fulfill our data compatibility and semantic web integration vision.

***The position is funded by USDA in collaboration with the Hsiao Laboratory located in Vancouver, British Columbia. The candidate will be physically located in Vancouver, British Columbia. The Hsiao Lab, based at the BC Centre for Disease Control Public Health Laboratory with academic affiliations at both the University of British Columbia and Simon Fraser University, develops innovative solutions spanning the entire knowledge generation spectrum from data processing, management, analysis, to knowledge representation and discovery.***

#### WORK PERFORMED

The candidate will apply their knowledge in food systems and nutrition to curate FoodOn and related knowledge bases. Curation of our FoodOn and related ontologies involves editorial examination of new term requests or revisions to existing terms and their hierarchies, all within the domain of food sources, ingredients and additives, products and nutritional analysis. Stanford University's open source Protege editing tool is used extensively to organize the material, as well as tools like OntoFox (<http://ontofox.hegroup.org>) for reusing terms from other existing ontologies. Work also involves performing logical reasoning checks to ensure term organization and usage conforms to the Basic Formal Ontology (BFO, <https://basic-formal-ontology.org/>) structure that ensures data interoperability between different ontology-driven resources. The candidate will gain experience in a new era of software development focused on standardization of data elements and structures using the OBOFoundry.org suite of open-source expert-curated ontologies. A creative aspect of the work involves introducing new ways - via scripts and software - to encourage public "crowdsourced" curation of term content, and integration with resources like Wikipedia, Wikidata, and Agrovoc for improving curation pipeline speed, and augmenting terms with images, semantic links, and multilingual translations.

## CONSEQUENCE OF ERROR

The applicant will be given a high degree of latitude and must be capable of excellent judgment, responsibility, and initiative in conducting research and ensuring the successful and timely completion of tasks. High-level decisions will be approved by the supervisor. Failure to achieve this level of performance will jeopardize continued funding of research projects. Failure to meet goals may result in suspended funding and will negatively impact the ability to attract future funds. Failure to establish best-practice protocols will broadly impact productivity of group by creating experiment failures and research delays.

### Qualification

- PhD (within 5 years of graduation) in a relevant discipline such as agronomy, computer science, nutrition or food science.
- **Needs to be an American citizen or permanent resident (Green Card holder)**

### Skills required

- Agricultural food production system familiarity in crop research and/or food nutritional research and/or food industry practice involving North American or global plant and animal food sources.
- Ability to effectively use Mac and PC, Microsoft Office or similar productivity software and online project management platforms.
- Ability to effectively manage multiple tasks and priorities, and work effectively under pressure to meet deadlines.
- Ability to compose correspondence, reports, presentations, and other written materials using clear concise business English. Ability to communicate effectively in writing. Ability to communicate effectively verbally.
- Ability to work independently with minimal supervision. Ability to gather, record, and organize information. Ability to be thorough, accurate, and have a high level of attention to detail.
- Ability to understand and apply policies, procedures, and instructions. Completion of on-site safety courses within the first two weeks of job.

### Nice to have but can be trained on the job

- Experience with Python scripting and Linux command line operations.
- Familiarity with OWL (Web Ontology Language) ontologies and SKOS (Simple Knowledge Organization System) vocabularies.
- Resource Description Framework (RDF) familiarity
- OWL 2.0 ontology curation and Stanford Protégé editor experience
- OBOFoundry.org ontology family familiarity
- Triple store database (e.g. BlazeGraph, GraphDB, Sesame) setup and SPARQL querying
- First order logic training and experience working with reasoning software

To apply please send cover letter and resume to: [Damion.Dooley@bccdc.ca](mailto:Damion.Dooley@bccdc.ca)  
[pratima.shrivastava@bccdc.ca](mailto:pratima.shrivastava@bccdc.ca)