

Alignment of the Ontology of Host-Microbiome Interactions (OHMI) high level terms with existing OBO ontologies

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Abstract

The community-based Ontology of Host-Microbiome Interactions (OHMI) has recently been developed. OHMI includes definitions for many high level terms including microbiome, microbiota, and host-microbiome interactions. There has been significant debate on how to best define these three terms. This poster abstract is submitted to evoke broad community discussion and eventual consensus.

Keywords:

Microbiome, microbiota, host-microbiome interaction

Introduction

The Ontology of Host-Microbiome Interactions (OHMI) is a community-based ontology aimed to represent various entities and relations related to microbiomes, microbiome host organisms (e.g., human and mouse), and the interactions between the hosts and microbiomes under different conditions. This abstract is aimed to introduce three high level foundational terms in OHMI and demonstrate how those terms were influenced by existing ontologies.

Methods

Protégé-OWL editor was used for OHMI editing. The OHMI website is available on GitHub: <https://github.com/OHMI-ontology/OHMI>. Group discussion was used to support microbiome definitions.

Results

Our OHMI definitions follow the proposal published in 2015 (1). Specifically, Microbiome is a subclass of the Environment Ontology (ENVO; <https://github.com/EnvironmentOntology/envo>) term 'biome'. In ENVO, biome is defined as an ecosystem to which resident ecological communities have evolved adaptations. Accordingly, the OHMI defines 'microbiome' as:

microbiome = def. A biome that consists of a collection of microorganisms (i.e., microbiota) and the surrounding environment where the microorganisms reside.

OHMI defines 'microbiota' as a subclass of the term 'collection of organisms' in the Population and Community Ontology (PCO; <https://github.com/PopulationAndCommunityOntology/pco>):

microbiota = def. A collection of microbial organisms that reside in a particular environment.

The OHMI 'host-microbiome interaction' is defined as a biological interaction between a microbiome and its host (Fig. 1):

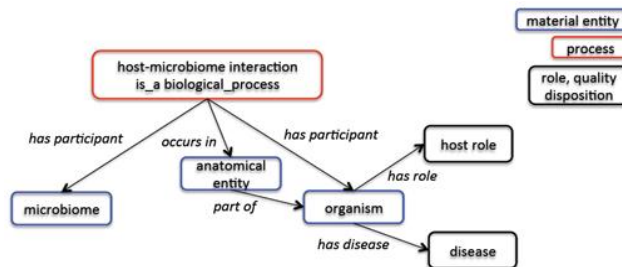


Figure 1. Basic OHMI representation of host-microbiome interaction and the components in the process.

Discussion

There has been debate within the microbiome related ontology development communities regarding how to define and align high level terms with Basic Formal Ontology (<https://github.com/obi-ontology/obi/issues/990>). The poster abstract is intended to demonstrate our achievement to date and to solicit feedback from the microbiome and ontology communities at large.

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References

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