Refining the Ontology for Glucose Metabolism Disorders

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Abstract. The Ontology for Glucose Metabolism Disorders (OGMD) was recently refined to meet two purposes: 1) contribution to Disease Ontology (DO); 2) to allow application to a social network study for Diabetes Mellitus researchers. It has been refined by applying the OBO Foundry principles.

The Ontology for Glucose Metabolism Disorders (OGMD) was developed four years ago mainly for supporting the translational study on Diabetes Mellitus. It is applied with the ontology of Geographical regions (OGR) and the Ontology of Genetic Susceptibility Factor (OGSF) for describing genetic susceptibility factors to Diabetes Mellitus [1]. Not only limited to the usage of its original purpose, OGMD as a terminology of disease names has gained attentions to informatics researchers in the field of Diabetes Mellitus (DM). For example, a group in Thailand who developed a Type II Diabetes Mellitus Clinical Support System has been reviewing OGMD in their study [2]. Another group in University of Michigan will use OGMD to analyze the social network of researchers working on Glucose Metabolism Disorders. Regarding users' requirement and the requirement of ontology's evolution by itself, OGMD has been refined recently and gained insights on the issue of ontology sharing.

There are two purposes to refine OGMD. One purpose is that OGMD contributes to Disease Ontology by providing it with disease terms. The other purpose is to serve the project of analyzing the social network of Diabetes related researchers located inside University of Michigan.

Since the initiation of OBO Foundry, the community has built up solid rules for developing OBO Foundry ontologies. It is necessary to follow the rules of OBO Foundry since OGMD has been built before those rules were released. An important change made in OGMD is to follow the OBO ID policy. Another change is that Relation Ontology (RO) has been imported into OGMD. Since DO is in obo format, OGMD has been developed as an OBO file as well.

There are 131 terms in OGMD. OGMD is available both in OWL and OBO formats. The classification of OGMD has been aligned with the related terms in DO. Among 83 OGMD terms that are not included in DO, 25 OGMD terms have been submitted to DO. OWL file is ready for the social network project application.

New classes have been developed, such as Diabetes complications, Diabetes as a complication of another disease. Using the objective relation *has_disposition* and *disposition_of* in RO (proposed version), the statements in OGMD: "Diabetes *has_disposition* Diabetes complications"; "Diabetes is a complication of other disease *disposition_of* Other disease" were established. Applying OGMD to the social networking project is on-going, and this application will give evaluation and validation to OGMD in the near future. It may enlarge the potential of sharing ontology by using only the minimum core relations and core terms within a domain.

References

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