Abstract — Bio and medical sciences produce large amounts of information and knowledge today. This has lead the bio and medical sciences to adopt techniques and technologies to represent and refine information and knowledge. Ontologies are well-defined and controlled vocabularies used to represent knowledge. Ontologies have been adopted also to bio-sciences. OBO representation language is used widely in bio-ontologies. However, OBO language is rarely used outside bio-sciences. On the other hand, many representation languages have been designed in computer sciences, especially in knowledge representation. Such representation languages include KIF, OWL, and Topic Maps. These languages are mature and have large user base. It would feel obvious to convert OBO formatted bio-ontologies to these knowledge representation formats. In fact such conversions exists. For example OBO to OWL conversion has been specified and implementation is available. However, OBO to Topic Maps conversion is not available.

Thesis specifies a conversion mapping from OBO representation language to Topic Maps. OBO to Topic Maps conversion specification is then implemented as an extension to open source Topic Maps editor application Wandora. Thesis reviews the implementation and it's quality is estimated. Conversion quality is evaluated with a test setting where 46 public OBO ontologies are converted to Topic Maps, and then back to OBO format, and original OBO ontologies are compared with roundtripped ontologies. Test results indicate 34 (74%) ontologies roundtrip without information losses i.e. comparison tool reports no differences between original and roundtripped ontologies. Thesis investigates all nonperfect roundtrips and reveals that OBO to Topic Maps conversion fails most often with OBO synonyms. Despite the nonperfect conversions, the mapping is still useful. OBO ontologies converted to Topic Maps can be used as knowledge components in Topic Maps applications for example. Thesis sketches example application where Topic Map conversion of Gene Ontology is merged with bibliographical Topic Map to increase ontology curation transparency.