

Refining Gene Ontology to Include Terms and Relationships Relevant to exRNA Communications

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Abstract

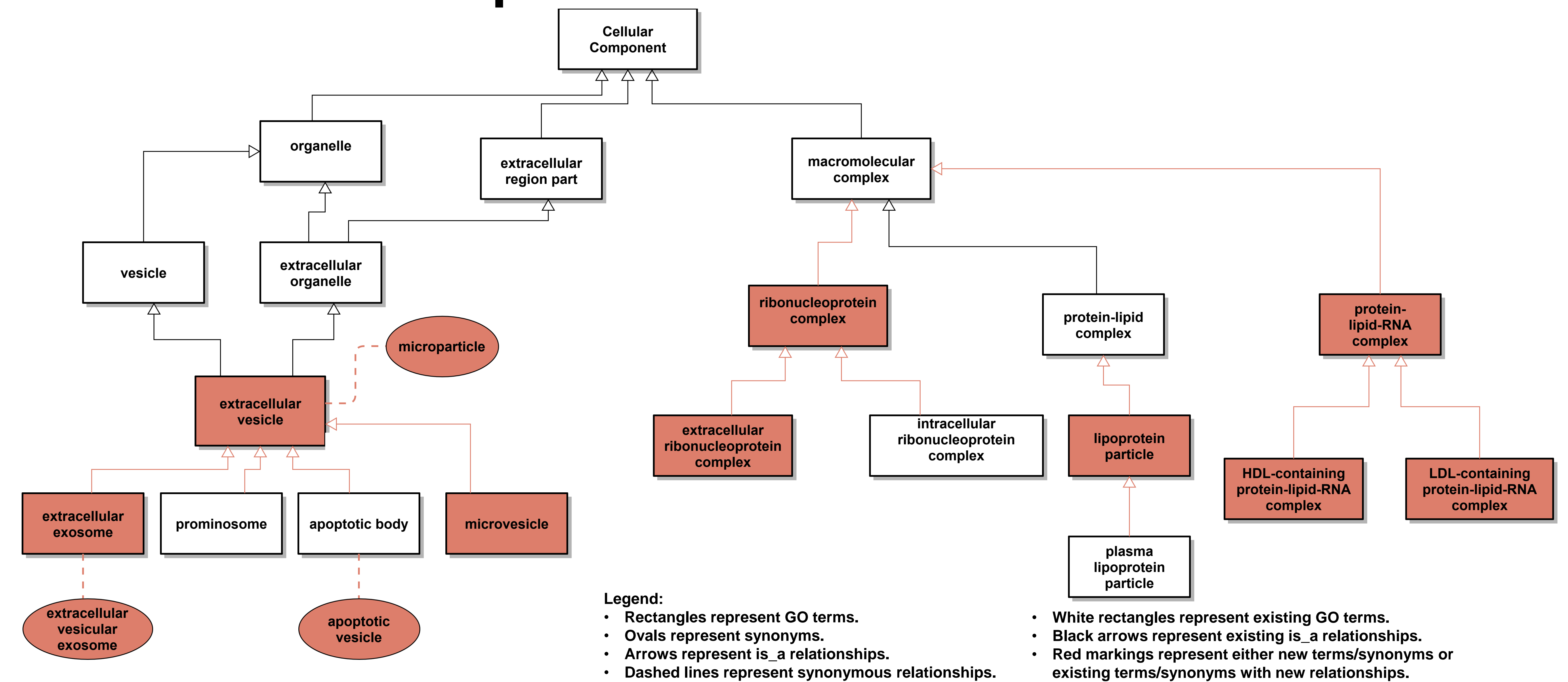
An ontology is used to represent domain knowledge in a standard machine-readable way to enable data annotation, discovery, and integration. The Extracellular RNA Communication Consortium has established an ontology group to work towards standardization and classification of the terms used to describe extracellular vesicles (EVs).

As part of this ontology effort, we have worked with domain experts and ontology experts to propose new terms and relationships that can be added to the widely-used Gene Ontology (GO) for describing EVs and other exRNA-containing particles. Our proposal reflects broad community consensus, as it was reviewed and approved by:

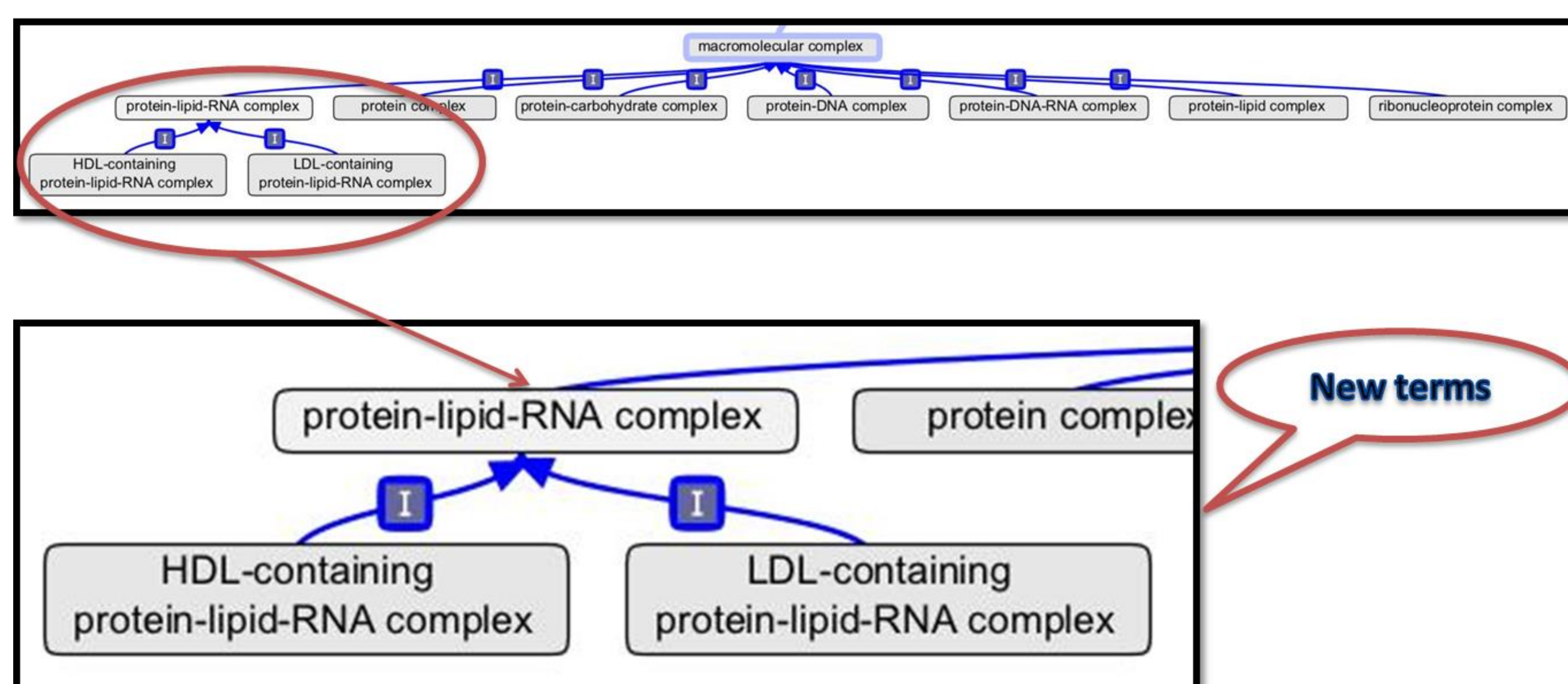
- International Society for Extracellular Vesicles
- American Society for Exosomes and Microvesicles.

In this attempt to standardize exRNA-related terminology, we strive to strike a balance between the “lumper” and “splitter” approaches in this new and incompletely understood domain. We are currently working closely with the GO Consortium to incorporate the proposed terms and relationships into the GO Cellular Component branch.

Extension of GO Cellular Component branch to include terms and relationships relevant to exRNA communications



GO Browser



GO:1990684 protein-lipid-RNA complex

definition: "A macromolecular complex containing separate protein, lipid and RNA molecules. Separate in this context means not covalently bound to each other." [GOC:vesicles, PMID:21423178, PMID:22028337, PMID:23559634]

comment: Examples of protein-lipid-RNA complexes are described in PMID:21423178 and PMID:23559634, both showing evidence that high-density lipoprotein (HDL) and, to a lesser extent, low-density lipoprotein (LDL) transport endogenous microRNAs (miRNAs) and deliver them to recipient cells with functional targeting capabilities. Also see fig. 1 in the review PMID:22028337. Not to be confused with GO:0034364 'high-density lipoprotein particle' or GO:0034362 'low-density lipoprotein particle', which describe complexes of proteins and lipids only, without RNAs.

synonym: "miRNA-lipoprotein complex" RELATED []

is_a: GO:0032991 ! macromolecular complex

relationship: has_part CHEBI:18059 ! lipid

relationship: has_part CHEBI:33697 ! ribonucleic acid

relationship: has_part PR:000000001 ! protein

Future Directions

- Add more terms and relationships that are relevant to exRNA communications
- Annotate metadata (metadata working group)
- Link to other ontologies
- Develop use cases for ontological data integration

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