DReNIn_O: An application ontology for drug repositioning

Joseph Mullen[1]

[1]*Interdisciplinary Computing and Complex BioSystems (ICOS) Research Group, School of Computing Science, Newcastle University, Newcastle upon Tyne, NE1 7RU, UK.*

Abstract

Drug development is both increasing in cost whilst decreasing in productivity [1]. There is a general acceptance that the current paradigm of R&D needs to change. One complementary approach is that of drug repositioning which focusses on the identification of novel uses for existing drugs. Many marketed examples of repositioned drugs have been identified through serendipitous or rational observations, highlighting the need for more systematic methodologies [2]. Systems approaches have the potential to enable the development of novel methods to understand the action of therapeutic compounds, but require an integrative approach to biological data. In this poster we present DReNIn_O, an application ontology for drug repositioning with the aim of making the relevant integration task easier. DReNIn_O represents data describing drugs in relation to their affect on targets and diseases. Developed to aid the integration and subsequent mining of drug repositioning networks, DReNIn_O semantically describes relationships between 25 data types relevant to drug repositioning. These types include: `Disease` (with child terms `Rare_Disease` and `Common_Disease`); `Drug_Molecule` (with child terms including `Small_Molecule`); `Biological_Molecule` (with child terms including `Protein` and `Gene`); and `Annotation` (with child terms including `Clinical_Trial`). An integrated RDF dataset that makes use of DReNIn_O is also presented. DReNIn_O is available for download from **http://bitbucket.org/ncl-intbio/drenin_ontology**

Keywords: Drug Repositioning, Data integration, Data mining, DReNIn O

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