

# Argumentation and linked-metadata services for reproducible target validation

<https://neurodegenerationresearch.eu/survey/argumentation-and-linked-metadata-services-for-reproducible-target-validation/>

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### Country

USA

## Title of project or programme

Argumentation and linked-metadata services for reproducible target validation

## Source of funding information

NIH (NIA)

## Total sum awarded (Euro)

€ 1,415,448.62

## Start date of award

28/09/2016

## Total duration of award in years

2

## The project/programme is most relevant to:

Alzheimer's disease & other dementias

## Keywords

Metadata, Graph, Drug Targeting, Semantics, Alzheimer's Disease

## Research Abstract

Project Abstract Recent studies have highlighted the very low efficiency (< 10%) of reproducibility for research on drug targets transferred from academia to pharma target

discovery. It is also well known that many failures across the drug development pipeline can be traced to inadequate drug target selection and validation. A striking case in point is the recent cluster of high-profile clinical trial failures in Alzheimer Disease (AD). In this case, a significant question now being asked is: was the common understanding of what was the “right target” actually correct? This in turn has led to an intensified search for new targets. While the robustness and reproducibility problem is highlighted in AD research, it extends across many areas of translational research in biomedicine and ultimately has a great impact on both healthcare costs and productivity of research. We believe it is possible to improve reproducibility and robustness by improving the fidelity and computational tractability with which research results are represented. This project will build and test advanced informatics methods for improving the reproducibility of biomedical research - by creating software to build, analyze and apply structured “standoff” metadata in the form of argument graphs (knowledge graphs, micropublications) across the assertions made and evidence presented in the biomedical literature and data archives. This metadata will be integrated with existing biomedical ontologies and serialized as linked data in RDF. Our objective in this project is to enable computational processing and reasoning over the details of claims, counterclaims, evidence and counter-evidence bearing upon specific areas - biological processes, mechanisms of drug action, etc. - required to be validated and understood in academic and pharmaceutical drug research and development. This project aims to demonstrate and explore feasibility of this approach. Our software will enable construction of (1) Highly specialized argument graphs as target validation criteria templates against which claims and evidence for pharmaceutical target advancement may be evaluated. (2) Libraries of graph metadata which can be assembled across entire areas of research, or applied one by one to individual articles. We will specifically target this project to Alzheimer Disease (AD). As part of our project we will develop a and publish corpus of detailed argument - claims - evidence graph metadata on the most influential articles in AD research covering the past 5-10 years. This is an area of great scientific and medical need, with many recent failures in clinical trials, no effective cures, a glaring need for new validated drug targets, and annual U.S. healthcare costs on the order of \$220 million per year.

### **Lay Summary**

Project Narrative Therapeutic drug development relies upon complex series of sophisticated experiments and theories to show that a drug is likely to be effective, before it goes to clinical trials. Unfortunately, academic research transfers poorly to pharmaceutical research, as recent studies show. This leads to many costly failures in the clinic, as recently shown in several Alzheimer Disease clinical trials. This project will build and test advanced computer methods for improving the reliable transferability of biomedical research to drug discovery, by building and analyzing computerized (“artificially intelligent”) logical models of all the scientific claims made and evidence presented across all stages of the research process in Alzheimer Disease.

**Further information available at:**

#### **Types:**

Investments > €500k

#### **Member States:**

United States of America

#### **Diseases:**

Alzheimer's disease & other dementias

**Years:**

2016

**Database Categories:**

N/A

**Database Tags:**

N/A