CAN GRANT CONCEPT CLEARANCE RECORD
FY 2019 RESEARCH INITIATIVE — NCATS
December 2017 Concept #1

CONCEPT TITLE: Biomedical Data Translator

CONCEPT TYPE: Cooperative Agreement

ASSIGNED DISCUSSANTS: Ling, Might

OBJECTIVE(S): The objective of the Biomedical Data Translator (Translator) program is to support research to develop a computational platform that enables connections among conventionally siloed data types. Translator aims to bring these together in an ecosystem that will reveal complex relationships that help scientists better understand disease and generate hypotheses and treatment options.

CAN PROJECT CRITERIA:
- **Collaborative:** Development of a powerful biomedical data translator will require collaboration. Covering the breadth of data types that is envisioned and establishing a computational platform for mining those data will require collaboration across several research teams, creating an ecosystem that includes not only data but the scientists themselves.
- **Discrete and Measurable Outcomes:** Initially, the primary measurable outcome will be the number and variety of different data sources that are integrated into the Translator. Later, the primary measurable outcome would be frequency of use by the research community.
- **Broad and Significant Impact:** A biomedical data translator would help scientists use data more effectively and enable researchers to develop hypotheses based on connections that otherwise were not apparent. While the initial target audience for Translator is a translational researcher, in the longer term, it has the potential to be a useful tool for clinicians and patients both as consumers as well as contributors of information.
- **Disease Relevance:** Translator might ultimately change how scientists and clinicians think about disease and treatment. In some cases, it may lead to classification of disease not based on what organ systems are involved but rather the biology underlying those conditions, which would in turn impact how doctors and scientists think about patient populations and the development of treatments.

HISTORY: Powerful new technologies are reshaping the biomedical research landscape, enabling scientists to map and decipher the 3 billion chemical letters that make up the human genome. Electronic medical records and clinical databases contain warehouses of patient information, and the throughput of -omic technologies has resulted in a flood of data under which we are now submerged. With each passing year, scientists sink exponentially further under this crushing wealth of information.

The problem is that the pace of data generation has dramatically outstripped researchers' ability to make sense of those data. The challenge lies not only with the volume of data but with the inherent nature of the technologies that results in data-specific silos. This specificity and volume make the challenge of relating a collection of one type of data to another type of data seem insurmountable.

Ideally, scientists would mine data from different sources to gain new insights into disease causes and biology and, more specifically, the relationship between disease biology and clinical signs and symptoms. But a lack of understanding of how so many different data types — genomic, cellular, and patient, for example — relate to each other has hindered scientists' ability to make inroads.

In September 2016, NCATS launched the Biomedical Data Translator program, called Translator for short. The vision was that this multiyear iterative effort would culminate in the development of a comprehensive Biomedical Data Translator that integrates multiple types of existing data sources, including objective signs and symptoms of disease, drug effects and intervening types of biological data relevant to understanding pathophysiology.

NCATS currently is funding Translator through its Cures Acceleration Network. Current awardees are assessing the feasibility of establishing a computational platform for meeting the goals of the Translator program. In addition to assessing feasibility of a platform, the awardees are identifying data integration and inclusion barriers, as well as a plan for data quality control and updates. The assessment also includes the exploration of models used in artificial intelligence to gain new insights into biology, health and disease.

Concept reviewers will consider features of the purpose, scope and objectives that are specific to each R&D project, including:
- scientific, technical or program significance of the goals of the proposed R&D activity;
- availability of the technology and other resources necessary to achieve the goals;
- extent to which identified, practical, scientific or clinical uses for the anticipated results exist; and
- adequate inclusion of women, minorities and children in clinical research, if applicable.

CONCEPT CLEARANCE DATE:
December 15, 2017

COUNCIL RECOMMENDATION:
The CAN Review Board approved as presented.

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