Proposal: Advancing the Science of Science Funding

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1. Collaborating organization: NIH/NIGMS (Jon Lorsch, Anna Calcagno & Silda Nikaj)

2. Research idea: The objective of this project is to explore how public investment in science and technology translates into technological applications that have commercial value.

To achieve this goal, the project will link the output of U.S. federal research grants (patented technologies and published research papers that acknowledge government funding) to final products available on the marketplace. We will consider both direct and indirect linkages. A direct linkage is when a patent funded by a public institution is protecting a product, and an indirect linkage is when a patent or a paper funded by a public institution is cited by a patent protecting a product.

We are particularly interested in understanding how NIH grants have contributed to new product development. This pilot project will be a major step forward in assessing the real impact of science funding. Note that we will explicitly not consider FDA-approved drugs, because these have been studied elsewhere. By "product" we mean, for instance, medical devices and diagnostics tools.

To identify the grant-to-(patent or paper)-to-product linkages, we will pull information from two recently developed databases: the IPRoduct and 3PFL databases developed at Ecole polytechnique fédérale de Lausanne (EPFL) by the PIs. The IPRoduct database links innovative goods sold in the U.S. economy to the patents upon which they are based. The data have been collected by crawling the web in search of "virtual patent marking" webpages, which provide constructive notice to the public that an article is patented. There are currently 8,000 products in the database, and we expect that a small fraction of these will be associated with NIH funding. More information on the project at http://www.iproduct.io. The 3PFL database tracks patented inventions and scientific publications related to a public procurement contract or a research grant awarded by the U.S. Federal Government. It also links these to detailed contract-level/grant-level information (e.g., awarding agency, recipient organization, award size). More information on the project at http://www.3pfl.io.

Connecting these two databases will allow us to identify three grant-product linkages:

i) Direct links: patents that are in the IPRoduct database that are also in the 3PFL database and are funded by NIH grants;

ii) Indirect link of type 1: patents that are in the IPRoduct database that cite patents supported by NIH grants in the 3PFL database as relevant prior art.

iii) Indirect link of type 2: patents in the IPRoduct database that cite scientific papers funded by NIH as relevant non-patent literature (NPL).

This pilot project will provide us with the possibility to characterize for the first time the relationship between ideas and knowledge generated with public funding, the characteristics of the funding, and the actual end-user market.

3. Nature of funding: If awarded, the funds will be used exclusively by PI Raiteri. The $10,000 will cover travel and accommodation costs for research stays at EPFL to conduct the data work. The funds will also cover travel and accommodation costs to meet with stakeholders at the partner institution.

4. CV: https://tinyurl.com/ycd97rbs and https://tinyurl.com/yagvkd5c

5. A note of support from the organization you propose to team up with. "The topic of tracing products back to NIH funding is of great interest to us. The approach is truly novel and will provide invaluable insights. We very strongly support the application and will provide the PIs with the background information and feed-back they require."