

PROJECT SUMMARY

MOD: Measurement and Analysis of Highly Creative Research in the US and Europe

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Creative capabilities are an important cornerstone of progress in science and technology, and also a precondition for advances in other societal domains. In the context of heightened competitive pressures to foster science-driven business development and the rise of new global locations for research (especially China), research policymakers in the US and other developed economies hope that adjustments to institutional and organizational environments for scientific research will promote not only more efficiency but also boost scientific excellence and creativity. In contrast with these needs, Creativity usually is investigated at the micro level through cognitive studies that embed investigators in research laboratories or apply psychological measurement of individual attributes such as intelligence. At the other extreme, it has been measured at the national level using national indicators of publication and citation strength.

This proposed project under the MOD designation will investigate features of the *meso* level (team, organizational, institutional) of the research environment enabling and fostering highly creative and unconventional research activities in human genetics and nanotechnology in the US and Europe. Building on a recently completed initial pilot study which identified highly creative scientists in these two scientific fields in the US and Europe, the proposed study will extend the measurement and analytical approaches to address the question: *What features of the environment at the meso level (team, organization and institution) have an effect on the creative achievements of researchers identified by peers and academic awards as highly creative and what patterns, if any, do these effects have in the career paths of these researchers.*

Intellectual Merit: With data from a previously conducted survey of peers yielding nominees plus a set of prize winners in the two fields, this project will develop a new database of Curriculum Vitae (CV) of the set of highly creative researchers and a comparison group to (1) reveal the influence of meso level contextual factors (team, organization and institutional) on the performance of highly creative research; (2) determine the existence of career patterns as a result of the interaction of the intrinsic ability of individuals and the features of the meso level environment that are associated with highly creative research; and (3) explore the relation of work assessed by peers to be highly creative with other features of a research career such as productivity, excellence and visibility. The study will contribute to the methodology of science studies for policy by further developing and extending CV analysis.

Broader Impacts: The identification of meso level factors in the research environment has implications for research and human resource management, and the design and implementation of funding schemes. Several of these factors – such as award mechanisms, funding programs, organizational set-up of research sites, and facilitation of career-relevant mechanisms – are of interest to university and faculty management, industrial R&D management, funding organizations, and national research policy. The use of comparative fields extends the range of impact. Human genetics is an established biomedical field supported by a relatively stable set of disciplines. In contrast, nanotechnology is a newer emerging and interdisciplinary field. Likewise, this project extends the findings to research and innovation systems beyond the US context. Public datasets containing variables related to creative researcher nominees, creative researcher and comparison group CVs, and awards and prizes will be made available for use by others. The project's dissemination plan not only contemplates the publication of results in peer reviewed journals, conferences and Web-accessible documents, but also anticipates conducting a policy workshop to further develop the implications of the study with science policy practitioners. Since the project will be carried out by an international team and study an international population of scientists, it will strengthen comparative international research linkages and provide opportunities for young researcher training in measurement of creativity and organizational influences.