

A Comparison of Social Science Research on Nanotechnology and Synthetic Biology

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Introduction

Researchers in the social sciences and humanities are increasingly involved in monitoring and assessing societal aspects of emerging technologies. This aspect of science and technology assessment has long been a part of biotechnology, witness the ethical, legal, and social implication (ELSI) allocation of 3-5% of the Human Genome Project budget of the US National Institutes of Health beginning in the late 1980s. Although reviews of these early ELSI activities were mixed, interest in involving social science in assessment of emerging technologies continues (Fisher 2005). This research examines the involvement of social scientists in two emerging technologies: nanotechnology and synthetic biology (synbio). We seek to understand similarities and differences in how the social science community is structured around these two technologies. In particular, we are interested in the extent to which these two emerging technologies share common or dissimilar social science knowledge sources. Our data source for this analysis is comprised of 1760 articles referencing nanotechnology from 1990-2012 and 143 articles referencing synthetic biology or synbio from 2000-2012 in the Social Science Citation Index and Arts and Humanities Citation Index of Thomson Reuters' Web of Science and Scopus. These differences in timeframe are in recognition of the more recent emergence of synbio in the mid 2000s (Peccoud 2012), notwithstanding the difficulty of affixing time boundaries to the "start" of these emerging areas. Our analysis will focus on the cited references in these papers, which will be cleaned particularly with reference to authors and journal names. We will then employ dimensional reduction techniques to understand the factors that form the basis for knowledge used in these two subfields, including which factors are common to both subareas. The results are expected to show that social science in synbio has more of a defined emphasis on medical ethics while nanotechnology's early years had more of a visionary and science mapping orientation, which since evolved into a multidimensional base of knowledge involving governance, public perception and deliberation, science and technology studies, ethics, and evolutionary economics (Shapira et al . This finding concerning synbio reflects its extension from earlier biotechnology and human genome activity. The ability of social science researchers to embrace these other dimensions of technological emergence as they observe the development of synbio remains an open question.

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