

# **Beyond the Lab and Far Away: Immediate and Future Challenges in Governing the Bio-economy**

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Today's bio-economy, where info-, nano-, and biotechnology converge, has the potential to yield great advances in all sectors, including medicine and energy, by using advanced modes of manufacturing at an atomic scale while achieving reproducible results. This creative convergence sounds exciting, but scientific advances and technological innovation do not come without some risks. Policymakers need to adopt a critical perspective on governance approaches regarding the bio-economy, keeping in mind how it affects our intricate sociotechnical system, our regulatory cultures, and the evolving relationships between researchers, funders, industry and the public. One of the greatest dangers facing innovation lies in the barriers that impede interaction between the developers of new technologies (the upstream scientists) and those responsible for assessing potential health, environmental, and other impacts (the downstream scientists). The Wilson Center's Science and Technology Innovation Program (STIP) has implemented a methodology called *trading zones* in which experts and non-experts from different disciplines and different sectors come together to discuss the science and implications of specific technological applications that are approaching commercialization. Within the trading zone, scientists, social scientists, technology assessors, policymakers, civil society actors, and regulators have been encouraged to open the "black boxes" that lie along the path of technological innovation. The emerging bio-economy is a complex landscape, but a look at the leading edges of the field indicates some of the challenges and opportunities governance efforts will face. The following paper presents two views from the frontier: one focuses on synthetic biology and the other focuses on the growing community surrounding do-it-yourself biology, or DIYBio.