

## Grasping Synthetic Biology

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My vision for engaged social science scholarship in the field of synthetic biology employs the image of grasping as a double metaphor. First, to grasp is to know - not just to know about or know of, but to achieve a tangible, visceral understanding. Grasping thus connects to notions of tacit knowledge, embodied expertise, and professional habitus. Second, to grasp another's hand – to engage – is not only to create the possibility that your power will move the other but also to risk that the other's power will move you. Grasping thus opens possibilities for deep knowledge across communities, but at the price of vulnerability. With engagement, protective distance – intellectual, social, professional, even physical – evaporates and the opportunity for intimate critique emerges.

Those of us involved in the Genetic Engineering and Society (GES) program at North Carolina State University have struggled with this “grasping.” We employ a vision in which scientists are not “defecting” and social scientists are not “studying up.” Instead, a group of scholars is learning, searching, and communicating together to understand genetic engineering in global, social, and cultural contexts. The academic engagement—grasping hands—aims to model engagements for other social groups interested in genetic engineering, including proponents and detractors but also the merely curious or concerned.

Interdisciplinary collaboration is key to the GES program's rigor and trustworthiness. We have often discussed the lack of trust among individuals and groups with divergent interests in genetically engineered organisms. Our historians, anthropologists, political scientists, and biologists recognize that it may be impossible to build an organization trusted by all parties in the dialogue. Despite this challenge, there are paths for putting together a generally trustworthy organization that provides global leadership on the topic. The GES program is starting down this path by emphasizing transparency and a diversity of voices. Some of our participants are strong advocates of genetic engineering, and others are skeptical or generally oppose it. We have been able to benefit from this contrast through honest and open dialogue with high standards of academic engagement. The challenge of speaking—and, more importantly, listening— across very distinct academic cultures is not trivial. Yet, the GES group has grasped one another with the intention of modeling such engagement for broader academic and public communities.

Where we may have fallen short, however, is in grasping and holding on through the full research process. We come together, but only partially, and rarely to pursue a common goal beyond the design and delivery of an interdisciplinary course or symposium. I suspect that we would need to overcome three barriers:

1. *Conflict avoidance.* Most researchers seem to avoid conflict, and to integrate multiple disciplinary ways of asking and answering questions will produce conflict. One potential solution would be to engage a third kind of professional in the research team – someone who is managing the group without a stake in the production of scholarship. Too often, in my experience, interdisciplinary groups look to the social scientists/humanists when conflict arises, as if their “softer” fields of expertise prepare them better to manage such

conflict. It is not clear to me that this assumption is accurate, and even if it were, it places an extraordinary and uneven burden on one part of the group.

- a. What if conflict was expected in an interdisciplinary effort and planned for?
  - b. What would working through conflict expose within and between disciplines that surround synthetic biology?
2. *Power inequities.* The large and small scale projects that bring together natural/physical scientists and social scientists/humanists tend to reify, structurally and rhetorically, the power disparity between these disciplinary traditions. I see no need to name specific projects here. When a system of research embodies this disparity from the very beginning, the grasping is uneven, in both senses of the word. I have witnessed and heard about too many examples where social scientists/humanists come to occupy the role of critics from the margins, or more disturbingly, embedded apologists.
- a. What if an interdisciplinary program in synthetic biology were structured to have an even balance of power between disciplinary traditions?
  - b. Could we imagine new roles for social scientists and humanists that disrupt the traditional narratives of marginal critics or embedded apologists?
3. *Resource constraints.* Within GES, the closer we have come to this model of grasping, the more we have witnessed the need for huge investments of resources. It takes tremendous time, energy, and mental space to grasp another discipline, another way of knowing, another researcher with different priorities and understandings than you. To be frank, a serious attempt at this project would require a strategy to free a group of interdisciplinary researchers from the normal constraints of academic life. While we might imagine recruiting only the most senior professors, who would presumably be less preoccupied with short-term production for tenure and promotion, this would sadly leave out the younger generation of scholars who may have been trained more explicitly in interdisciplinary collaboration.
- a. What if participants had the time and space to focus on grasping without needing to produce according to the typical academic timeline?
  - b. How could such a project support rather than disrupt the career of young academics?

This paper is meant to serve as a call and a warning. The call is for the exploration of grasping synthetic biology in a deep way that destabilizes current traditions in interdisciplinarity that have resulted in conflict avoidance and power inequities. The warning is that doing so half-heartedly could be damaging and wasteful.