Memorandum

To: Chris Field, Drew Endy and Don Kennedy
From: Steve Stedman and Tarun Chhabra
Subject: Panel Discussion at CISAC (Thursday, May 13)

Thanks once again for agreeing to join us for the panel discussion scheduled for this Thursday afternoon (330-5pm).

As we indicated to you when organizing this panel, this project is still in its early stages. What we would like to do on Thursday is to explore several working propositions that are guiding our thinking. At this point, we have firm convictions about some of these propositions and doubts about others. Therefore the primary purpose of the discussion really is to hear from the three of you.

This project originated in our work at the United Nations and follows some of the work by the National Academy of Sciences, which has called for a more robust international consensus on evolving risks and appropriate responses to exponentially advancing developments in the life sciences. In 2004, we urged Kofi Annan's High-level Panel on Threats, Challenges and Change to include some discussion and recommendations on this issue in its final report, and we also urged Annan to take up some of these recommendations in his own report to heads of state gathered at the General Assembly in 2005 World Summit. In addition, we encouraged Annan to use his bully pulpit to raise awareness of the issue and to leverage his convening power to engage with prominent business leaders and scientists in the biotechnology industry. Annan delivered a speech at St. Gallen that addressed the issue, but his tenure was up shortly thereafter, and his successor's attention to these questions has been sporadic at best. While there have been some limited efforts to deal with the global dimension of this problem, such as the activities of the International Council on the Life Sciences (ICLS) and International Roundtables jointly organized by the U.S. National Science Advisory Board on Biosecurity (NSABB) and the World Health Organization (WHO), they have been unable to provide the sustained engagement and consensus-building we believe the challenge requires.

As you can see in the borrowed title for Thursday's panel, we take seriously Drew's concern (and bon mot): discussion of the risks of biotechnology is too often bipolar, tending toward either apocalyptic alarmism or unreflective, even hubristic, technological optimism. These competing impulses are understandable. Considering the scope and range of health and development challenges we face today, the promise of advances in the life sciences cannot be realized too soon. But there is also justifiable concern that we have not come to grips, in terms of reasonable prevention or preparedness, with the potential for catastrophic accident and abuse. Thus the first step as we see it is how to encourage - within the scientific community, within the policy community and between them - a dynamic, rigorous, ongoing, global assessment of the risks and promise of rapidly evolving developments in the life sciences. The second step is determine how best to translate that consensus into agreement on global standards to best manage such risk. We have no view as to what form such standards should take, nor do we think any proposed mechanism must be explicitly policy prescriptive.

As you aware, we are looking specifically at the IPCC as a potential model for achieving the first stage of consensus, and the crux of our project is to determine whether there exists in the realm of life sciences a potential for marshalling a constellation of interests, actors and scientific expertise analagous to that which we have seen around the IPCC. Where we determine that some aspects of the IPCC model do not survive the transposition, we need to ascertain the possibility of alternative and compensatory conditions that nevertheless might ensure some degree of success.

In the course of the discussion on Thursday, we would ask that you consider the questions raised by the nine propositions below. These working propositions address the nature of the problem in the life sciences (1-3); the functional role and record of the IPCC (4-5); and the transferability of the IPCC model to the problem in the life sciences (6-9). We anticipate spending the bulk of our time on Thursday afternoon on the transferability issues.

Nine propositions:

- *Proposition 1: Existing efforts to address the current and near-term risks posed by the convergence of globalization and dramatic advances in the life sciences do not address adequately the potential for misuse and abuse of the latter.*

This seems to be a shared premise of the National Academy of Sciences' Fink and Lemon-Relman reports, and also of the ongoing work of the National Science Advisory Board on Biosecurity. It also is our starting premise. But the second premise of our project is disagreement within the life sciences community on this question; hence,

- *Proposition 2: There is significant disagreement within the life sciences community - both within the U.S. and globally - as to the nature of the risks presented by the trajectory of current academic and commercial research in the field.*

Our understanding is that there is significant disagreement in the scientific community on the characterization of risk as it pertains to both safety and security of biotechnology. This of course tends to thwart consensus on remedial measures (though it need not, as we note/warn below). This disagreement might be accounted for at least in part by an apparent absence of systematic risk assessment and modeling that incorporates, in an inclusive manner, the full spectrum of views held by scientists in the field. It is harder to ascertain whether there is disagreement between the scientific community and the policy community (to the extent that the relevant latter group is not composed of scientists, or is not acting on behalf of advising scientists); such disagreement might not become manifest until a significant incident. But it would seem to be in the interest of the scientific community to arrive at a consensus position so as to forestall potential overreaction and ensure better-informed decision-making by policymakers in the event of such an incident. There are plenty of episodes in which policymakers have taken action, for better or for worse, despite acknowledged uncertainties and expert disagreement (for example, the Kennedy Administration's reaction to Rachel Carson's *Silent Spring* or the Bush Administration's biosecurity policies issued in the immediate aftermath of 9/11 and the follow-on anthrax attacks).

- *Proposition 3: We lack informed, public deliberation about how best to manage the risks emanating from advances in the life sciences.*

Even if there is some modicum of consensus between scientists and policymakers, shifting public opinion can make policy consensus volatile, or even simply defy any official consensus. The lack of an informed public deliberation on how best to manage the risks associated with advances in the life sciences is therefore a latent risk to continued government support for the substance and tempo of current life sciences research. The often poorly informed and alarmist resistance to genetically modified (GM) crops – and in some cases, its efficacy in capturing policy – is a case in point. The lack of public deliberation on this question is also problematic from the normative standpoint of democratic values. If we accept that we should engage in informed, democratic deliberation when the social, economic and individual/dignitary stakes are high, it is hard to make out a case that risk management for revolutionary developments in the life sciences should somehow be an exception. Multi-year polling suggests that the American public's understanding of the risks and benefits of developments in biotechnolgy is low, and that it has not appreciably improved over the course of the decade. There is also variation in terms of approval or disapproval across the spectrum of technologies. The bottom line seems to be that public opinion on biotechnology remains up for grabs, and is vulnerable to volatility.

- *Proposition 4: The IPCC has been successful in forging a global scientific and, to a lesser degree, policy consensus on the likelihood of anthropogenic climate change and its potential impact.*

We also are satisfied to proceed on the basis of a weaker version of this proposition: at a minimum, the IPCC has had an impact in building a scientific and policy consensus that is more robust than there would have been either in its absence, or had there had been only a nongovernmental mechanism arriving at similar conclusions. The basis for proceeding with our project is that this proposition holds true in spite of the focused assaults on the credibility of the IPCC and on climate science more generally. Whether the IPCC's assessments have translated into an international policy consensus on solutions is analytically distinct but of course important to consider. But even where they have not, if scientific consensus translates at least into more informed public deliberation, there is at least some prospect of domestically-driven consensus.

- *Proposition 5: The IPCC's (a) system of robust and transparent peer review; (b) parallel system of separate scientific and policy reporting; and (c) geographic inclusiveness in review and membership have been crucial to its legitimacy within both the scientific community and, in turn, the policy community.*

Bert Bolin (a key player in the founding of the IPCC), Steve Schneider and many other members of the IPCC consistently underscore the IPCC's robust and transparent system of peer review as critical to its success in building consensus within the scientific community. This two-stage system of review, involving "expert review" followed by "government and expert review," is spelled out in elaborate detail in the IPCC's official documentation. Although recent controversy has raised some concerns about potential vulnerabilities in the IPCC's review process, there does not seem to be much reason to doubt Bolin and Schneider claim. (The IPCC also has

commissioned an external InterAcademy review of its processes and procedures to address such concerns.) Other members of the IPCC whom we have interviewed have emphasized the importance of an apparently strong norm of restraint among government reviewers of the Panel's scientific reports. While the shorter policymaker summaries are often subject to more overt political wrangling, governmental review of the scientific reports tends to be more uneventful, typically approving – relatively unscathed – the first stage of purely expert review. Several of our interview subjects have expressed surprise, and occasionally outright puzzlement, at this governmental restraint in the drafting process for the Panel's scientific reports.

Geographic inclusiveness, particularly with respect to scientists in developing countries, also has been a hallmark of the IPCC's procedures for review and membership (enshrined in its "Principles Governing IPCC Work"). Some participants and observers have gone so far as to cast this inclusiveness as the IPCC's raison d'être.

- *Proposition 6: The primary function of a new intergovernmental mechanism would be to provide a scientific assessment of the global risks and benefits of emerging technologies in the life sciences, including their potential health-related, environmental and economic impacts.*

The IPCC was established to "provide the world with a clear scientific view on the current state of climate change and its potential environmental and socio-economic consequences." IPCC Working Group I assesses the "physical scientific aspects" of both the climate system and climate change. Working Group II assesses the "vulnerability of socio-economic and natural systems to climate change, negative and positive consequences of climate change," and both sectoral and region-focused options for adapting to it. Working Group III assesses options for mitigating climate change through limitations or prevention of greenhouse gas emissions and promotion of activities that remove greenhouse gases from the atmosphere; in so doing, it addresses the costs and benefits of the different approaches to mitigation, and is "more and more solution-oriented."

Our thinking at this stage is that the proposed new mechanism should be engaged primarily in assessing the benefits and risks of emerging developments in the life sciences. This would encompass assessment activities analogous to those of Working Groups I and II of the IPCC. The solution-oriented assessment as undertaken by Working Group III is potentially severable. An alternative, solution-oriented assessment would be to identify industry-generated or state-generated best practices on safety and security, which of course entails an implicit cost-benefit analysis. While our motivating concern has been safety and security risks associated with biotechnology research, including the prospect of malevolent use, there are probably good reasons for the mandate of the proposed mechanism to be wider, encompassing risk assessment for GM crops and organisms, and bioethical issues construed more broadly. Expanding the mandate of the proposed mechanism also might serve to build a broader coalition of support (if, for example, agrobusiness sees a potential for mitigating anxiety about GM crops). The optimal breadth of the mandate is for us an open question.

- *Proposition 7: Risk assessment on the potential impact of developments in the life sciences is not fundamentally different from risk assessment conducted by the IPCC Working Groups II and III.*

Although the assessment exercise of Working Group I necessarily entails a degree of uncertainty, it is arguably quite different from the proposed life sciences assessment in that, while the former is designed to document an unfolding and consistently observable process, the latter would be engaged in more speculative risk modeling; many of the risks envisioned have yet to materialize. Risk assessment in the proposed mechanism is also distinct and further complicated in that it entails modeling the likelihood not only of accidents and misuse but also of malevolent use. Nevertheless, Working Groups II and III do engage generally in risk modeling in assessing likely impacts of climate change and of potential solutions. We are particularly keen to hear your views as to whether you believe that the nature of risk assessment is qualitatively different for the challenge in the life sciences, and whether this poses a challenge to transferability.

- *Proposition 8: The structural incentives and resources of potential supporters and adversaries of the proposed mechanism are analogous to those associated with the IPCC.*

We are somewhat skeptical of this proposition. First, the IPCC operates on the basis of tens of thousands of hours (Chris, please correct us for likely understatement) of volunteer labor by academic or government scientists. Many if not all of these scientists offer their services and expertise primarily because their professional careers have been devoted to building greater consensus and awareness of climate change and its potential impact. It is hard to see an analogous situation for life scientists and the proposed intergovernmental mechanism. Very few life scientists have staked their careers on demonstrating the risks of emerging technologies. Many, of course, have devoted their professional lives to realizing its potential benefits, but precisely for this reason, many are skeptical of alleged risks. Thus life general scientists' interest in committing personal time and resources to the proposed mechanism is arguably a precautionary one at best.

Second, whereas much of the opposition to climate science and the IPCC specifically has come from industries and interests outside the realm of climate science itself, the proposed mechanism arguably would have to cope with much more internal dissent. That is, potential industry opposition to the proposed mechanism and its potential regulatory consequences is not outside the realm of life science, but rather, a major constituency within it, not to mention an important source of funding for academic life science.

Third, there is a question of demand for such a mechanism, and what kind of critical mass of government support would be required to get it off the ground. The IPCC was set up formally by the World Meteorological Association (WMO) and United Nations Environment Programme (UNEP), with mandates provide` by the UN General Assembly and, subsequently, the UN Framework Convention on Climate Change (UNFCCC). Many accounts of the early development of the IPCC also credit the U.S. leadership, including public support, however modest, from President George H.W. Bush and his Secretary of State, James Baker. Others have suggested that the inception of the IPCC is largely a story of scientists' policy entrepreneurship creating state demand.

Another noteworthy aspect of the founding of the IPCC is its initially limited membership; the eventual expansion of membership suggests that such a group need not be universal at birth, and

in fact, limited membership in the IPCC's nascent stages might have been a virtue for its ability to consolidate crucial substantive and procedural norms.

A further dimension of demand is whether a formal treaty framework was necessary for sustaining intergovernmental, scientific and public attention. One member of the IPCC has noted to us the stark contrast in public profile of the IPCC as compared to the tepid reception of the Millennium Ecosystem Assessment, the scientific credibility of which has been widely acclaimed. Whether a proposed mechanism for risk assessment in the life sciences requires a treaty framework is an open question. An alternative would be to tie in such a mechanism to an existing international agreement; the Biological and Toxins Weapons Convention (BWC) is one such option, but there are serious doubts as to whether the BWC's state-centric arms control framework would be detrimental to building scientific (especially that of industry) and policy consensus. Similar reservations might be voiced against a proposal to anchor the proposed mechanism in the World Health Organization's revised International Health Regulations, in the negotiations for which "securitization" was politically toxic. A looser G-20-style framework is another option, but this is to some degree the current state of affairs – which we have suggested is inadequate – in the form of U.S.-led roundtables organized by the National Science Advisory Board on Biosecurity.

A final note on structural incentives, actors and resources is that the requirements of sustaining an ongoing risk assessment mechanism are not necessarily the same as those of getting one off the ground. The institutional setup, political alliances, methodological orientation, review processes and resource requirements likely will, and perhaps should, shift over time.

- *Proposition 9: However well-suited to the scientific and policy challenge an intergovernmental mechanism might be, potential adversaries' awareness of the IPCC's success and high profile is likely to make establishing an analagous mechanism today far more difficult than it was at the inception of the IPCC.*

This is a rather straightforward, practical qualification to any arguments about transferability.

Please let us know if we can clarify anything in advance of Thursday's discussion. We are grateful for your participation.