

## March K2K: NH Questions by Category

### A. Science and Technology Priorities: Decisions, Basis for choice and Trade-off measures

In this category we have two central issues:

1. *Who is served: the individual or the social/global good?*
  - a. Realistically, as of today, what specifically are the sorts of advances we should expect to see in what specific time frame and at what specific costs? Which of these are strictly nanotechnology and which are “convergent technology” (NBIC)? It is critical that the object of consideration be clear: is it just nanotechnology or is it just NBIC? Or, is it both and if so, how do we clarify what is being referred to?
  - b. How expensive is this work compared to the other fields (e.g. genetic research) preventative public health and medicine?
  - c. Why should the priorities of nano-tech and NBIC as broadly applicable technology be taken any more seriously than past innovations such as The green revolution (No hunger), Nuclear Power (too cheap to meter), etc? With respect to actual and projected social problems, are there better investments to be made in existing or alternative technologies?
  - d. What is the public policy process to ensure access to NBIC developing technology for underserved populations?
  - e. How important is the quality of compassion in determining research priorities?
  
2. *What is realistic and what is conjecture and what will it all cost?*
  - a. What is the applicability of these scenarios (e.g. doc-in-a-box) to problems on the societal level rather than individual/personal level?
  - b. What are the responsibilities of the developed countries to the developing nations with relevance to technology?
  - c. Will funneling funds toward human enhancement compete with funds for cleaner energy/environment or other pressing social needs?
  - d. Wouldn't true societal/scientific progress mean peace & prosperity for all? Is NBIC a solution in search of a problem or is it responsive to pressing social needs? For example, are there investments in science and public policy to address problems such as individual aggression and its detrimental effects that should take priority over public investments in nanotechnology or NBIC?
  - e. Who decides what disease takes priority of publically funded R+D?

## **B. Regulation and Oversight (two central issues)**

1. *How are ethical priorities established & by whom? Who gets what? Who decides?*
  - a. Who judges the psychological stability of potential recipients of NBIC technology?
  - b. What rights do minors have to accept/reject nano & what age is acceptable?
  - c. What are the boundaries of discrimination? Who receives? Equal opportunity?
2. *Will this technology be a public trust or private enterprise-who regulates*
  - a. Should/will the government establish a dept. of NBIC- to minimize political influences?
  - b. How will we distinguish between genome manipulation & somatic changes? Who/How?
  - c. Is it possible to slow down this trend? Should we?
  - d. What process exists to regulate, monitor and ultimately discard frivolous proposals: those that exhibit the over-reach of intelligence over wisdom, self-interest over the common good, and technological over-determinism?
  - e. What scientific/clinical vetting process will be implemented to avoid harmful effects of the law of unintended consequences on patients, the environment and society in general?
  - f. Who will control/govern the nano and NBIC Lobby/special interests?
  - g. Will 'National Security' be used as an excuse for focusing on military advances over other categories?

## **C. Distinguishing Individual Technologies: i.e. Nano vs. Bio**

1. What is the current practical potential for genetic engineering or prostheses development to cure or treat genetic/other diseases?
2. What kinds of NBIC technology are already in place that can be considered 'human enhancement'? Define 'human enhancement' and identify the categories.

## **D. Unintended Consequences**

1. For some of the Nano-scenarios given, what warning signs do you look for along the way to raise "Red-Flags" that might indicate unintended consequences down the road?

2. If we engage in artificial learning, what are the implications for where/when will humans learn humanity, develop character, and discover civic responsibility & experience intimacy?
3. Will Nanotechnology further the isolation of individuals through virtual social environments? (Nature deficit disorders)
4. How do we ensure the compatibility of implanted nanotech drug delivery with randomly introduced drug?
6. How are the future effects of genetically engineered “enhancements” modeled to verify that unintended consequences are minimized (in future generations)?
7. What are (if any) effects of tailor made medicine vs. ‘one pill fits all?’