
Role of Governments and Public Institutions

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The stated purpose of this workshop was to consider: 1. what responses are needed from government to deal with new knowledge about plant, animal and microbial genomes; 2. how the interest and investment of the public is best protected; and 3. what ways government can make investments toward useful new knowledge about genomes. The viewpoints of federal and state government, governments of other countries, land-grant universities, other public universities, and federal and state agencies were to be included in the discussion.

During the first workshop session, the co-chairs introduced themselves to the group and provided brief descriptions of their interest and involvement in the roles of governments and public institutions in genome related issues. The co-chairs personal interests ranged from direct involvement in the discovery, analysis and exploitation of genes from various organisms, to roles in assessment of public policy and technology, to development of regulations for oversight of the introduction of genetically modified organisms into the environment.

Following these brief statements, the workshop participants separated into four subgroups that were each led by one of the co-chairs. During the next two workshop sessions, subgroup participants identified, clarified and prioritized issues of concern to the subgroup, and formulated recommendations to address these issues. In the final workshop session, representatives presented a summary of the issues and recommendations from each subgroup. Following these presentations, the workshop participants discussed all of the subgroup issues and recommendations. They then merged them into a set of six areas of concern with component issues and accompanying recommendations. The participants then prioritized the six areas of concern by group vote.

Areas of Concerns

The following are summaries of the six areas of concern and the workshop participants' consensus recommendations for addressing them. Areas of concern are presented in the priority order established by the group vote.

Need for Biotechnology Education

Issue 1. Agricultural producers (farmers) require access to information on biotechnology. Extension and research personnel have a critical role in providing this information.

Recommendations

- *Each school or college of agriculture should identify biotechnology specialists who can be contacted by field/county extension staff for information, program development and program delivery.*
- *NABC should work with extension leadership to include biotechnology awareness and education in extension education programs.*
- *NABC should identify and encourage development of needed educational materials (e.g., brochures, e-mail bulletin boards, videotapes, etc.).*
- *NABC should encourage testing and evaluation of commercial biotechnology materials and products, including cost-benefit analysis, in public sector institutions.*
- *NABC should encourage the use of input from user advisory groups to assist in setting applied biotechnology research priorities.*

Issue 2. There is a need for increased public awareness of biotechnology issues. Only through education can the public be empowered to participate in debates on specific biotechnology issues and products. Education is needed at all levels – from K-12 to undergraduate curricula – to dialogue with opinion leaders. For the general public to make educated choices and decisions, they need a strong knowledge base about the technology and related issues. They need skills in evaluating information.

The researcher has the responsibility not only to do high quality research, but also to communicate clearly research results and their significance to the public. The researcher should serve as an educated, unbiased voice, available to all parties. Public institutions also have a responsibility to increase public awareness, and should work with professional organizations, community groups, farm organizations, industry and educational organizations to satisfy this responsibility.

One example of a forward thinking program is USDA's Ag in the Classroom program. Pioneer Hi-Bred's Living History Farm is also an example of the kind of educational tool that could be developed.

Recommendations

Undergraduate education

- *NABC should encourage incorporation of ability to understand and interpret biotechnology in undergraduate “core” curricula, with special attention to risk assessment, technical, ethical and socioeconomic issues.*

K-12

- *NABC should publish a list of educational materials on biotechnology.*
- *NABC should encourage state and local teacher groups to hold workshops on biotechnology.*
- *NABC should develop youth education programs, using programs such as 4-H as a means of biotechnology education.*
- *NABC should work with vocational agriculture teachers and support efforts to incorporate biotechnology training in vocational agriculture curricula.*

Opinion leaders/public

- *Scientists should appreciate the importance of and receive training in media relations.*
- *NABC should encourage TV programming (Discovery, NOVA, etc.) and other forms of mass media-based education to provide information to the public on biotechnology.*
- *Through its member institutions, NABC should encourage workshops, conferences and other public forums designed to include the broadest range possible of constituent groups in an on-going dialogue on biotechnology issues.*

General

- *NABC should involve educators in programs such as this meeting and provide specific, more targeted workshops for teachers to develop educational materials.*

Issue 3. The increasing role of intellectual property rights in academic research has had a substantial impact on graduate students and the research environment, and should thus be addressed in graduate education.

Recommendations

- *Graduate and undergraduate curricula should include specific training in intellectual property rights and issues.*
- *NABC institutions should develop a clear policy describing the rights and responsibilities of graduate students regarding intellectual property rights.*
- *NABC should act as a catalyst to develop a curriculum addressing intellectual property rights and ethical issues.*
- *NABC should act as a clearinghouse for educational programs and institutional policies on intellectual property rights.*

Current intellectual property rights laws and policies, and the increasing reliance of researchers at academic institutions on private sector sources of research support: restrict public access to genetic materials, technologies and information; limit free market competition; reduce research opportunities and innovation; limit the knowledge base; and restrict educational opportunities.

Recommendations

- *Policy for release of intellectual property by public institutions should be based on a mandate to promote the public good rather than motivation to increase institutional financial resources.*
- *Public advisory groups should have input into setting policy for release of intellectual property by public institutions.*
- *Public policy should be devised to maintain broad access to tools of biotechnology (germplasm, genes, methods) developed at public institutions.*
- *Public law should provide a more liberal research exemption on patented intellectual property.*
- *The courts should apply anti-trust laws to ensure competition in the biotechnology industry.*
- *The term of ownership of patented intellectual property should be re-examined with the goal of balancing economic returns to investment versus opening the knowledge for future productivity and innovation.*
- *While there was not unanimous support for the recommendation, many workshop participants felt that the Patent and Trademark Office should issue utility patents only on the final product (plant genotype), rather than individual components or processes (e.g., genes or transformation methods).*

Need to Identify and Involve Stakeholders in Defining the Public Good

There is a need to identify and involve stakeholders in defining the “public good” with respect to intellectual property rights, and in setting agendas and policies for public institutions.

Recommendations

- *NABC, in collaboration with land-grant and other universities, and organizations such as CAST (Council for Agricultural Science and Technology), should sponsor a national panel of stakeholders in agricultural biotechnology (farmers, consumers, environmental groups, government, seed trade associations, etc.) to define the “public good;”*

assess the effects of intellectual property rights on technology transfer and utilization; and issue a report.

- *NABC should encourage greater participation of legislators and other government officials in NABC annual meetings.*
- *For public input to have impact, the public institutions should seriously listen to comments and be held accountable to public advisory groups.*
- *Appropriate research roles for the government and public institutions include enhancing the use of biotechnology in minor crops to promote diversification for family farmers, promoting new and innovative uses of agricultural commodities through biotechnology, and promoting environmental responsibility in the use of agricultural biotechnology products. These roles can be implemented only if public funding for agricultural biotechnology research is increased.*

Research Incentives

The shift from public to private funding is influencing the direction of research programs. Support is still needed for quality research and outreach with the public good in mind, regardless of short-term potential for commercialization. The incentives for the researcher need to be considered as the funding structure and the research products change.

Recommendation

- *There should be motivation provided for fundamental and applied research, for commercialization of results from research and for exchange of information with other researchers, teachers and extension faculty.*

Reinvestment of Profits from Publicly Funded Research

Publicly funded research generates valuable intellectual property which, in turn, may generate income to public institutions.

Recommendation

- *Distribution of royalties and license fees from publicly funded research should be returned to the institution/unit that developed the intellectual property, to be reinvested in research.*

Research Regulation and Safety

There is a need for appropriate balance between caution, innovation and commercial development in the regulation and the release of new products from biotechnology.

Recommendation

- *Products posing different levels of risk should be treated with different levels of stringency in oversight. Care in regulation is of special concern regarding environmental release of genetically modified organisms with the ability to propagate in the wild.*