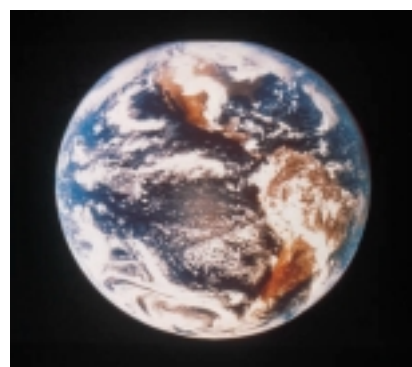


BIOTECHNOLOGY ADVISORY PANEL REPORT

Purpose of Report

August 2002

The intention of this report is to provide a first assessment of the Panel's interaction with DuPont and their level of satisfaction in participating on the Advisory Panel. It has been approved by all Panel members and includes direct interview material from each member. This report is divided into three sections:



- ◆ *Background information regarding the Panel and the current membership;*
 - ◆ *The Panel's consensus assessment regarding their participation on DuPont's Biotechnology Advisory Panel; and*
 - ◆ *Individual perspectives from each of the Panel members regarding their particular areas of interest and expertise as it relates to biotechnology.*
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BIOTECHNOLOGY ADVISORY PANEL REPORT

BACKGROUND

Biotechnology Advisory Panel

On September 22, 1999, Chad Holliday, Chairman and Chief Executive Officer for DuPont announced his company's intention to form an independent panel "to guide our actions, help us create positions on important issues, and guide and challenge us in the development, testing and commercialization of new products based on biotechnology." Since that time, a prestigious Panel of individuals from around the world has been convened. The group has met five times over two and a half years to exchange information and opinions on various aspects of biotechnology.



Panel Membership

The Biotechnology Advisory Panel represents a diversity of international interests, academic and vocational expertise, and cultural backgrounds. All are cautiously optimistic about the potential good biotechnology can do as the world struggles with how to deliver safe and nutritious food to the world's populations while decreasing the use of chemical pesticides. At the same time, the Panel members are well aware of the unknowns and potential downsides associated with biotechnology. It is part of their role to raise such issues, push DuPont's thinking on these issues, and to help problem solve where appropriate. Panel members believe companies and countries need to work cooperatively in an effort toward sustainable development and with a strong commitment for core values that guide use of new technology; that it is important to draw on a diversity of experience in order to navigate historical mistakes and to properly address future problems; and that this type of interactive dialogue can have value for the multi-national corporation as well as for the regions of the world represented on the Advisory Panel.

The Panel is comprised of 5-8 individuals who will serve a period of time and then rotate off the Panel to allow for new perspectives to have a seat at the table. Panel members travel expenses are covered and members are offered a small honorarium for the time they spend in meetings.

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PANEL MEMBERS

Dr. Arthur Caplan (*Panel member from February 2000-Present*), Emanuel and Robert Hart Chair for Bioethics and Director of the Center for Bioethics at the University of Pennsylvania. Dr. Caplan is an internationally known bioethicist. More information regarding Dr. Caplan and the Center for Bioethics can be found at www.bioethics.org.

Professor Chunming Chen (*Panel member from January 2002-Present*), Founding President of the Chinese Center for Disease Control and Prevention, previously known as the Academy of Preventive Medicine. She is currently the senior advisor of the institution and a professor of nutrition. She is also special advisor for international collaboration, Union School of Public Health, Beijing Union Medical University (PUMC), chairperson of the advisory committee on public health, Chinese Ministry of Health, Advisor of the Chinese State Consultative Committee on Food and Nutrition, a member of the World Health Organization's Expert Advisory Panel on Nutrition, and a member of the United Nation's Food and Agriculture Organization Expert Panel on Ethics of Food and Agriculture. Professor Chen is an internationally recognized expert in nutrition.

Mr. Jonathan Lash (*Panel member from February 2000-Present*), President of the World Resources Institute, Washington, D.C. Mr. Lash is recognized worldwide for his role in public policy development. More information regarding Mr. Lash and the World Resources Institute can be found at www.wri.org.

Dr. R. K. Pachauri (*Panel member from February 2000-July 2002*), Chairman of the Intergovernmental Panel on Climate Change (IPCC) and Director-General of the Tata Energy Research Institute (TERI), a New Delhi, India based organization with branches in several countries, that conducts research focused on the sustainable and efficient use of the world's natural resources. Dr. Pachauri is internationally respected for his leadership in sustainable development.

Mrs. Tiahoga Ruge (*Panel member from February 2000-July 2002*), Director-General of the Center for Education and Training for Sustainable Development (CECADESU-SEMARNAT). She was the Founding President and Director of the North American Center for Environmental Information and Communication (CICEANA), a Mexico City-based organization that is working to improve the environment using information, communication and environmental education to create greater public awareness. She is well-known for her efforts in the area of environment and education.

Dr. Florence Wambugu (*Panel member from February 2000-Present*), Founder and Director of A Harvest Biotech Foundation International (AHBFI) and former Director of the International Service for the Acquisition of Agribiotech Applications (ISAAA), African Region Office in Nairobi-Kenya, an organization that is working to help alleviate hunger and poverty by increasing crop productivity. Dr. Wambugu is an internationally renowned scientist. More information regarding Dr. Wambugu and AHBFI can be found at www.ahbfi.org.

BIOTECHNOLOGY ADVISORY PANEL REPORT

FROM THE BIOTECHNOLOGY ADVISORY PANEL

The following comments are our consensus reflections regarding our participation on DuPont's Biotechnology Advisory Panel. This is our frank assessment based on our collective experience over the last three years on the Panel. As of July 2002, we have met with DuPont a total of five times to discuss specific topics identified by both DuPont and the Panel. Each of us is in contact with Paul Tebo, Vice President for Safety, Health and Environment at DuPont, through the interim periods and we additionally work with other members of DuPont on site-specific and on-going topics as they arise. We have been very satisfied with our participation on the Panel and look forward to continuing to provide input and guidance to DuPont. We hope to share with you the flavor of our interactions with the DuPont Team and our level of satisfaction as members of this Panel.

As a Panel we offer the following collective thoughts.

BIOTECHNOLOGY ADVISORY PANEL ASSESSMENT

DuPont is clearly very committed to this process.

As each of us assessed the invitation from DuPont to participate on this Panel, we carefully considered where our time was best spent regarding the biotechnology issue. We have each been a part of advisory panels that have proven to be ineffectual, or that were convened for the purposes of paying lip service to stakeholder involvement, or hoping that panel members would "rubber stamp" particular practices and policies. Ultimately, we have found none of these to be the case with the DuPont Biotechnology Advisory Panel. The Advisory Panel's approach has, in part, been set up for success due to the following characteristics:

Meaningful Participation.

We have experienced focused and meaningful participation from all Panel members, as well as access and real participation from highest levels of leadership across DuPont. DuPont has been able to dialogue along side other Panel members as we all vet issues, raise questions, voice concerns, and problem-solve where appropriate. A neutral facilitator assists in this process.

All topics are considered "on the table" for discussion.

Agendas are created with our influence and input. We have discussed such issues as: what it means to be a responsible leader in the area of biotechnology; labeling; bio-based materials and processes; biodiversity and biosafety; and the ethical, cultural, and moral issues pertaining to biotechnology.

DuPont often solicits our thoughts and advice in the formative stages of policy and product development.

We recognize that product and policy development are extremely sensitive to corporations. And yet, it is crucial that advisors have access to such information at the formative stages, if a company is sincere about stakeholder involvement and its ability to influence. DuPont has been open in sharing information regarding product development, as well as policies that are in the formative stages, and thus the Panel has maximum potential to influence direction.

BIOTECHNOLOGY ADVISORY PANEL REPORT

Our advice has affected significant and incremental change at DuPont Corporation.

Increased Appreciation for Transparency and External Perspectives.

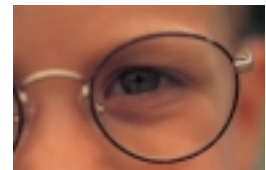
We believe DuPont has an increased appreciation for the importance of transparency when working with those outside the company and for the value external perspectives bring when developing business in a global world.

DuPont uses their influence in industry initiatives and in other forums to increase transparency and include external perspectives in discussions.

While sometimes meeting with limited success, DuPont works to influence and shape the perspective of other industry leaders based on Panel advice.

Design of a Science Knowledge Assessment.

In our first meeting, we emphasized to DuPont that top priority be placed on the safety of biotechnology. As a result, DuPont prepared a comprehensive review of the science and reviewed this with the Panel. Following our discussion and suggestions for improvements to make the assessment more "user friendly," DuPont is placing this assessment on their biotechnology website at: http://www.DuPont.com/biotech/science_knowledge/index.html



Development of a DuPont Biodiversity Position.

The Panel has urged DuPont to carefully consider what role biotechnology plays as it interfaces with issues of biodiversity. The Panel encouraged DuPont to develop an official position regarding biodiversity, and DuPont is nearing completion of its official position, with our input on several drafts.

Exercising the Precautionary Principle.

The Panel has increased DuPont's sensitivity in issues such as allergenicity and antibiotic markers that require a company to exercise precaution.

Examining Lessons Learned and Application of Lessons to Emerging Issues.

The Panel has urged DuPont to prepare themselves for the inevitable lessons that will emerge as the use of biotechnology continues to grow. We have had rich discussions regarding the potential for genetic introgression of native maize species and how lessons might be applied to future situations.

Identification of New Issues.

The Panel members have helped to raise emerging issues as they relate to biotechnology. For example, Biodiversity was a Panel-driven discussion. Additionally the Panel has raised the important issue of credible educational materials regarding biotechnology. We look forward to future discussions on this topic.

BIOTECHNOLOGY ADVISORY PANEL REPORT

There are areas we would like to continue to challenge DuPont's thinking on in the future.

A more aggressive Biodiversity Position.

We are pleased DuPont is developing a position on biodiversity, but will continue to push their thinking on what kinds of actions might continue to illustrate such a commitment. Additionally, we continue to urge DuPont to think of diversity broadly - both biologically and the importance of preserving cultural diversity. The impact of the Biodiversity Position will depend on DuPont's consistency and thoroughness in implementing it throughout its operations. The Panel looks forward to evaluating DuPont's progress in the future.



The Responsible Response.

With significant evidence emerging that genetic introgression of native maize species has occurred in Mexico, the Panel is working with DuPont in thinking about what is a responsible response by a corporation in these situations and how such circumstances might be avoided in the future.

Access and Benefit Sharing of Plant Genetic Resources.

The Panel feels that issues such as access to genetic resources; patents; and intellectual property rights are vitally important. The Panel recommends that DuPont consider convening additional, auxiliary conversations on these topics. The Panel is committed to helping DuPont think about how best to do this.

Biotechnology in Developing Countries.

The Panel looks forward to continuing to work with DuPont on how biotechnology might address issues of poverty and hunger in developing nations. A crucial element will be the involvement of the company in more projects in developing countries, which in the immediate future builds local capacity for sustainable food security in those countries, and in the long-term develops business value.

BIOTECHNOLOGY ADVISORY PANEL REPORT

PANEL MEMBER PERSPECTIVES

From the Perspective of Dr. Arthur Caplan, Bioethicist at the University of Pennsylvania

Question: *As a bioethicist, what are your primary concerns regarding the development of biotechnology?*

Art Caplan: Biotechnology has come in for some very rough treatment in terms of ethics. It simply got off on the wrong foot. Companies failed to be clear about what foods had genetically modified ingredients, what the rules were for introducing these ingredients into the environment and what sorts of tests had been done to verify safety.

Biotechnology can be used, in my view, ethically in the food chain. Those who wish to use the technology need to do three things: clearly label all foods or have information available on all foods so the consumer can make informed choices about foods with

genetically modified ingredients; use the technology to make food healthier and safer for the consumer--demonstrating "value on the plate" for genetically modified foods; and reduce the burden of modern farming on the environment by adhering strict rules that respect and enhance biodiversity.

"People value informed consent because they value their right to determine how they live their lives."

The Panel has advised DuPont that having a set of formal principles to guide the development and commercialization of biotechnology would be very useful. Over the past year and a half, The Center for Bioethics at the University of Pennsylvania has been developing a set of principles that cover a range of points such as labeling, responsibility, fair access, respect for diversity and the duty to make food safer and healthier. At the most recent meeting, the Panel members and DuPont began the discussion of these draft principles.

Question: *The issue of informed consent is hotly debated in the arena of biotechnology. What are the bioethical considerations you would highlight and what is your best advice to DuPont regarding this issue?*

People value informed consent because they value their right to determine how they live their lives. To do this people require information about risks, benefits, options and alternatives in making choices. DuPont must be very sensitive to the power of the value accorded informed consent. Every action taken to advance the utilization of biotechnology must be consistent with each individual's right to exercise choice about what they eat and what is present in their environment.

BIOTECHNOLOGY ADVISORY PANEL REPORT

From the Perspective of Professor Chunming Chen, Founding President of the Chinese Center for Disease Control and Prevention

Question: *What are the major barriers to biotechnology crops meeting the nutritional needs of the Chinese people?*

Professor Chen: My greatest concern is regarding nutrition for children. Emphasis in China, due to the population, needs to be on increasing the nutritional value for crops such as rice and wheat, not necessarily crop yield. Biotechnology can be extremely helpful in this challenge and there is huge potential for collaboration between companies like DuPont and the Chinese people. We must find ways to exchange information and knowledge among scientists from DuPont and scientists in China. The biggest barrier is the intellectual property rights issue. It is necessary for developing countries to design partnerships that allow for free flow of scientific information without becoming dependent on foreign companies in an unhealthy way. I very much look forward to continued Panel discussions on this topic.

“It is necessary for developing countries to design partnerships that allow for free flow of scientific information without becoming dependent on foreign companies in an unhealthy way.”

Question: *Education is clearly an important issue to you; what educational issues need the most attention in biotechnology?*

Professor Chen: In China, and in other countries, education is important as people do not understand the risks and benefits of biotechnology foods, and sometimes this can lead to misunderstanding about the technology. Some scientists understand this issue, but if mainstream citizens are given fair and balanced information, they will have the ability to choose. Newspapers and television programs that emphasize scientific perspectives on the risks and benefits are likely to be the most effective way to reach the Chinese public.



Question: *What role should the private sector have in education?*

Professor Chen: The private sector should provide resources in terms of information, funding, and experts. In China, the government and organizations such as the Society for Science should also play a role in delivering educational messages about the risks and benefits of genetically modified foods.

BIOTECHNOLOGY ADVISORY PANEL REPORT

From the Perspective of Mr. Jonathan Lash, President of the World Resources Institute (WRI)

Question: *You have served on a number of Advisory Panels in your career at the World Resources Institute. What are the characteristics of effective Advisory Panels?*

Jonathan Lash: The risk in getting involved in a corporate advisory panel is that the company is interested in appearances rather than getting and using advice - and that the board is convened for the purposes of “greenwashing.” This can be a dangerous for both the company and participants’ credibility. In these ill-conceived advisory panels, the company may keep important issues, sometimes those issues most crucial to the success of the failure of their business, hidden from their advisors. DuPont’s Biotechnology Advisory Panel receives up-to-date, frank information regarding the company’s business and strategies, and regular reports on how we have been able to influence the company with our collective advice. That’s not to say that there aren’t times where it might be appropriate for DuPont to respond that “we don’t feel comfortable talking about that at this time” or “that issue is really sensitive for us right now, and here’s why...”

“At every meeting I feel I learn something new and I am able to contribute to the company’s thinking about biotechnology and sustainability.”

Question: *How does DuPont’s Biotechnology Advisory Panel measure up?*

Jonathan Lash: I have been deeply impressed by the fact that nothing seems “off the table” in talking with DuPont about biotechnology and their current and future products. The Advisory Panel is truly used in an advisory capacity. We are able to jointly bring controversial issues to the meetings and we are asked and expected to push DuPont’s thinking around particular topics. Additionally, DuPont has the “right” people from the company at the meetings and therefore we are able to have thoughtful back-and-forth conversations with individuals ranging from the policy-makers at the corporate level to the implementers and inventors of new lines of business. At every meeting I feel I learn something new and I am able to contribute to the company’s thinking about biotechnology and sustainability. For these reasons, this is the best advisory panel I have ever been a part of. I think that probably the Advisory Panel could be even more effective by working on particular topics and issues with DuPont between meetings.

Question: *Knowing much of your work at WRI focuses on sustainability, how does this link with biotechnology?*

Jonathan Lash: As the world population grows, it requires more food. We are interested in technologies that responsibly reduce chemical inputs and the amount of land necessary for growing agricultural crops.

BIOTECHNOLOGY ADVISORY PANEL REPORT

From the Perspective of Dr. R. K. Pachauri, Chairman of the Intergovernmental Panel on Climate Change (IPCC) and Director-General of the Tata Energy Research Institute (TERI) in New Delhi

Question: *Please explain the role you believe agricultural biotechnology can play in feeding the poor. What are the primary barriers to achieving this?*

R. K. Pachauri: I believe agricultural biotechnology can play a major role in feeding the poor, because with growing population and limited land area, we have to find ways by which the yield in production of food is increased substantially. The green revolution in several parts of the world has reached a limit, which can only be crossed by the development of new varieties using genetic engineering and modern biotechnology methods. The major barriers to the use of agricultural biotechnology lie in the fact that the public perception of this subject is very negative. I believe it is also important for countries like India and China to do a substantial amount of Research and Development (R&D) in this field, because this would make economic sense and even greater political sense. Hence, multi-national companies working on agricultural biotechnology, should set up major R&D and extension facilities in these countries and establish joint ventures to the extent possible.

“...increases in yields would make a great difference in promoting sustainable development and reduction of poverty.”

Question: *If you could suggest one area for the company to focus its biotechnology efforts on to promote sustainable development, what would it be and why?*

R. K. Pachauri: I think one area that DuPont should focus on relates to crops and coarse foodgrains largely grown in rainfed areas. These lie in some of the poorest regions of the world, and increases in yields would make a great difference in promoting sustainable development and reduction of poverty.

Question: *Do you have any advice to give the company regarding the role of biotechnology and climate change? Should the company be focused on biofuels? If so, how do you see it evolving in a country like India in which food security is still a major issue?*

R. K. Pachauri: I think the company should define opportunities and priorities for work resulting from assessments of future climate change. For instance, there would be much greater salinity resulting from climate change as sea levels rise in several parts of the world. The need would be to develop salt resistant crops, and in many other areas drought resistant crops. India is likely to be impacted seriously by climate change. But, I think the subject requires some detailed research for DuPont, assessing priorities and opportunities for working in this area. Incidentally, TERI has done a significant amount of work on the impact of climate change, particularly in agriculture.

BIOTECHNOLOGY ADVISORY PANEL REPORT

From the Perspective of Mrs. Tiahoga Ruge, Director General of the Center for Education and Training for Sustainable Development in Mexico

Question: *How is cultural diversity linked to agricultural diversity?*

Tiahoga Ruge: In areas of great agricultural biodiversity, there is typically a great deal of cultural diversity. In places where there are many elements in nature, you find more developed cultures. One area of cultural diversity is expressed through a culture's food and diversity of food. As we see depletions in a region's biodiversity the link results in the depletion of a region's cultural diversity as well. It is imperative that DuPont and other multi-national biotechnology companies act with great responsibility when working with these regions, as ecological and cultural integrity are both at stake. This Advisory Panel continues to emphasize the importance of partnering with countries as DuPont looks to work in regions rich in diversity.

Question: *What is the importance of biodiversity as it links to biotechnology and what advice do you have for DuPont regarding this?*

Tiahoga Ruge: Our Panel meetings have had some very lively discussions regarding the issue of biodiversity as it relates to biotechnology. The Panel strongly advised that DuPont develop a biodiversity position and the Panel members have helped to shape that document. Still, I believe, and the other Panel members believe, that the



government's credibility in relation to this issue, and consequently makes international communities suspicious of U.S. based multi-national companies like DuPont.

“Specifically we would like DuPont to continue to think about and take very progressive positions on benefit-sharing intellectual property rights of genetic resources, and development of new projects with developing countries.”

position ought to go even farther than it currently does. Specifically we would like DuPont to continue to think about and take very progressive positions on benefit-sharing, intellectual property rights of genetic resources, and development of new projects with developing countries. While DuPont has stated to the Panel that they, as a company, are supportive of the elements of the Convention on Biodiversity, I continue to urge DuPont to work with the U.S. government to sign the Convention on Biodiversity. This Convention clearly articulates positions on many important issues. Not signing onto the Convention hurts the U.S.

BIOTECHNOLOGY ADVISORY PANEL REPORT

From the Perspective of Dr. Florence Wambugu, Founder and Director of A Harvest Biotech Foundation International in Kenya

Question: *Why should DuPont consider more North-South country partnerships in the area of biotechnology? Who would gain from such partnerships?*

Florence Wambugu: Partnerships around the development and distribution of genetically modified organisms and crops can benefit both the North and the South a great deal. The North has the infrastructure and the investment capital necessary to develop and customize biotechnology products for various regions. The North is looking for additional markets for the technology they have developed. The South represents untapped markets for the North. We have a great deal of people and a food deficit; there is a huge need for consumer products offered through biotechnology.

“The art of ‘doing business’ is very different from country to country and culture to culture.”

Question: *What then, are the barriers to this producer/consumer relationship developing?*

Florence Wambugu: While countries in the South, like Africa, have the market - the countries are not developed enough to be sustainable markets for the North. Currently the South does not have the money to purchase these products we are very interested in. Thus, part of a good North-South relationship is helping the South create and stabilize their infrastructure, which naturally leads to a country's increased ability to purchase biotechnology products. A necessary part of this equation is determining the issue of intellectual property rights and benefit sharing of genetic resources. It is a lot of legwork, but is ultimately a win-win situation for both the country and the company.

Question: *What types of mistakes have you seen companies make when trying to develop relationships with countries such as Kenya? What advice would you give to DuPont as they consider such partnerships?*

Florence Wambugu: The art of “doing business” is very different from country to country and culture to culture. While e-mail and telephone are efficient ways of doing business in today's world, in some places, “you don't really exist, until they see your face.” It is essential to work with local indigenous people. It is the ethical and smart thing to do as these individuals have the respect and trust of the consumers DuPont will try to reach. The private sector, government agencies, international aid organizations, and local communities all have a role in the capacity building that will create and maintain strong North-South partnerships.



The Keystone Center for Science and Public Policy serves as a 3rd party neutral facilitator for DuPont's Biotechnology Advisory Panel. Please contact Janesse Brewer of The Keystone Center with any questions or comments regarding this report. Ms. Brewer can be reached at 970-513-5847, or by e-mail at jbrewer@keystone.org.
