BUSINESS AND REGULATORY NEWS

## *The Lancet* in GMO dispute

News that one of the world's leading medical journals, *The Lancet,* planned to publish some of the results on the toxic effects of genetically modified potatoes on rats from Arpad Pusztai, formerly of the Rowett Institute near Aberdeen, has brought a swift reaction both from environmental groups and from the scientific community. A spokesman for Friends of the Earth said that he was "delighted" that Pusztai's work would finally be published in a peer-reviewed journal. "All the politicians, officials, and scientists who tried to rubbish Dr. Pusztai and his work will owe him a sincere and public apology." However, a number of *The Lancet*'s own referees have threatened to "go public" with their concerns unless *The Lancet* makes it clear that several of them had severe misgivings about the paper. One referee said that that the only real conclusion from the paper was that raw potatoes are not very nutritious for rats. Another called it "a shambles." The Royal Society has confirmed that the *Lancet* article contains the same flaws as the data that it had first reviewed (and rejected) in May this year: too few animals were used, diets were uncontrolled, and controls were inadequate or absent (*Nat. Biotechnol. 17*, 207).

## Biosafety talks stall again

In Vienna during late September, negotiations over the Biosafety Protocol, which is part of the 1993 international Convention on Biological Diversity, stalled again as a loose alliance of agricultural product–exporting nations insisted that the draft protocol apply only to genetically modified organisms (GMOs) and seeds being released into the environment. Called the Miami Group, it consists of the United States, Canada, Australia, Argentina, Chile, and Uruguay. Most other nations want the protocol to apply more broadly to a range of products, including foods and animal feeds, derived from GMOs. The Miami Group is also seeking simplified regulatory procedures governing such exports, including provisions stating that products that have received approval from domestic authorities may be exported without awaiting full regulatory review by importing countries. Protocol negotiations are to resume in Montreal in January 2000.

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## State needs more science

Members of a US National Research Council (NRC; Washington, DC) committee recently attributed some of the current international level discord over GM crops and foods, as well as related disagreements with provisions in the current version of the Biosafety Protocol, to poor planning and a lack of scientific expertise within the US State Department (Washington, DC). These cases were cited as exemplifying systemic weakness on science, technology, and health (STH) issues throughout the department. NRC members called on Secretary of State Madeleine Albright to give "greater attention to the STH dimensions of foreign policy," to reorganize how the department deals with such, and to improve scientific literacy and build awareness of scientific issues among personnel at all levels. These recommendations are detailed in a report prepared by NRC, the operating arm of the National Academy of Sciences, following a 1998 request for advice from State Department officials.

## Biotech booster site

The Alliance for Better Foods has launched a new website providing fact-based information about how biotechnology benefits agriculture and food (www.betterfoods.org). The alliance is a coalition of 26 organizations—including the Grocery Manufacturers of America (GMA), the USA Rice Federation, and the American Soybean Association—and the website reflects the perspective of not only the food industry, but also farmers, retailers, and growers.

As well as consumers, the site is aimed at policy makers and regulators who may not be familiar with the history of food biotech—to help remind people that GM food is not new and that the safety processes have been in place for several years, according to Brian Sansoni, GMA senior manager of public policy communications. "Those who put out the misinformation and smear campaigns are sometimes very good at what they do, and are clearly trying to replicate what they did in Europe…it's important to provide a reasonable foundation for good information and a forum for questions and answers," he says.

Sansoni adds that GMA fully supports the current labeling policy setup by FDA. "It's science based and it's quite reasonable in providing truthful, not misleading, information."

## GMO roundup

• European consumers demanding GM-free products in the supermarkets are about to be hoisted by their own petards as soybean producers in Brazil attach a significant premium to their own supposedly GM-free crop. Following a court judgment in September, Monsanto (St Louis, MO) must conduct a one-year environmental impact analysis before it can legally sell Roundup Ready soy in Brazil.

• Meanwhile, Brazil's most southern state, Rio Grande do Sul, is trying to stem what appears to be a black market in transgenic seeds flooding in across Brazil's southern border. The primary incentive for using the seed is economic, with farmers reportedly able to save $25–30 per hectare on chemical costs using Roundup Ready varieties. Officials have set up an 800 snitch line, "Dial Transgenics," allowing law abiding nontransgenic farmers to become anonymous informers on their technology-embracing neighbors. The police have been given powers to burn GM crops if they are found. The measures are in support of Brazil's strategic position on soy exports, say officials, which is that the country wants to be able to supply European demand for transgenic-free food.

• Among the latest commercial beneficiaries of the anti-GM mood that has swept through Britain's consumers and supermarkets is the Dundee-based firm, Alchemy Laboratories. The company has produced a device similar to a home pregnancy kit that can detect the *Bacillus thuringiensis* insecticidal protein in soy and maize flour within a few seconds. This means it stands an extremely good chance of detecting the *Bt* protein in organically produced crops that have been treated with *Bt* as a bacterial preparation. The £1 ($1.5) device is based on an immunosorbent assay method. However, it is not quantitative and therefore would not be useful in assessing food containing permitted levels of GM components. Nevertheless, Alchemy claims its test is aimed at farmers, supermarkets, and food manufacturers in order to help them monitor the ingredients that they are processing. Inventor of the test and Alchemy's managing director, Richard Lamotte, was recently awarded the Tayside John Logie Baird award for the test, an award named in honor of the Scottish inventor of the mechanical television scanning system (an innovation, incidentally, that was rapidly superseded by electronic scanning.)

## Ag committee labors over labeling

Messages about biotechnology and agriculture were decidedly mixed during two days of hearings in early October before the US Senate Agriculture, Nutrition and Forestry Committee. The hearings were convened by Senator Dick Lugar (R-IN), who calls the public debate over this technology in Europe "particularly bewildering" and says that concerns there appear to derive from "cultural aversion to the idea of biotechnology and food" rather than from "scientific evidence of risk."

However, Representative Dennis Kucinich (D-OH) told the committee he plans to introduce a bill in the House of Representatives requiring a label for foods that are genetically engineered. Another witness, Mark Silbergeld of Consumers Union (Washington, DC) said that labeling is needed to guarantee consumers a right to choose between engineered and unengineered foods. But representatives from several organizations, including those representing the biotechnology industry as well as major agricultural and food-producing trade groups, urged that labeling not be imposed on such foods. And, weighing in for the first time on these issues, the National Grain and Feed Association (Washington, DC) agreed that labeling is not required but recommended development of new testing technologies to detect biotechnology enhancements in products as a way of providing "the marketplace with tools. . .to minimize market-flow impediments and associated market risks."

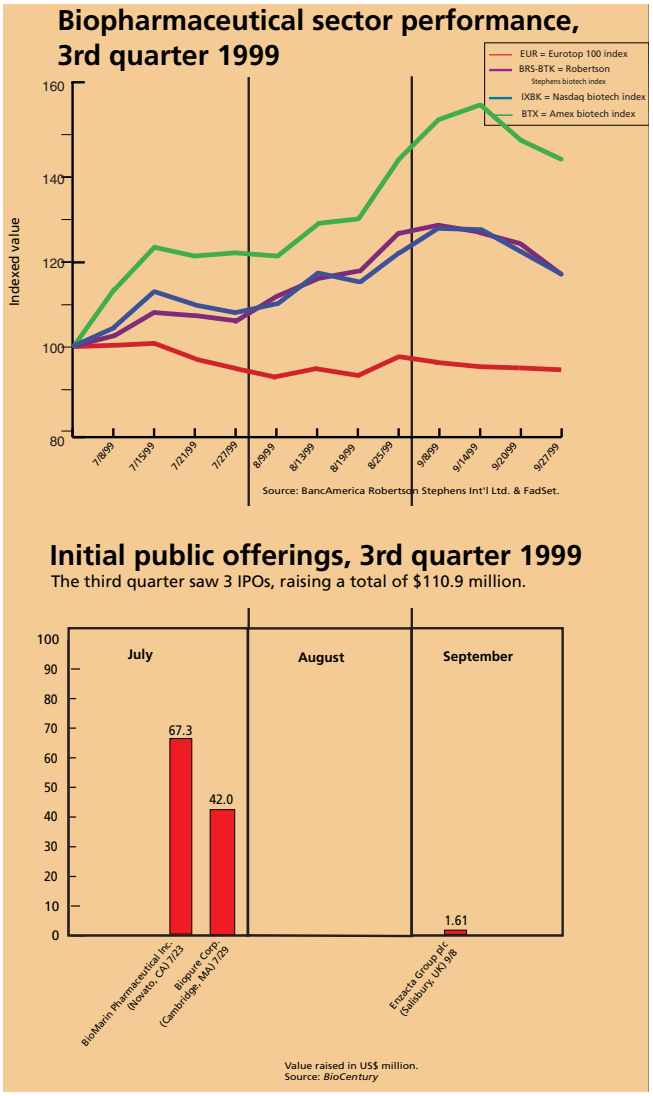
## Pro-GMO ministers sidelined

The October ministerial reshuffle of the UK government has sidelined two of the most vociferous supporters of genetically modified food. Jack Cunningham, the "Cabinet Enforcer" charged with the responsibility of aligning policy across the different government departments, has resigned and been replaced by Mo Mowlam, formerly the Northern Ireland secretary. Although Cunningham is a member of the Soil Association—the UK's organic farming umbrella—he had nevertheless held the government's supportive line that GM food was safe and that large-scale tests to assess environmental safety should continue unhindered. The other loss is Jeff Rooker, formerly the food minister at the Department of Agriculture, Fisheries and Food, who has now been transferred to the Department of Social Security. He was a staunch defender of science-based approaches to the regulation of GM foods.

One of Cunningham's last acts was to back a "peace plan" over the issue of GM food and crops. Monsanto, a number of environmental and consumer groups, and the Cabinet Office have agreed to enter a dialogue chaired by the Environmental Council, a charitable organization that aims to bring stakeholders in controversial green issues together. That dialogue is likely to be a slow process: preparatory meetings held in the last few weeks have done little more than pave the way for a bigger meeting in the spring.

## Anti-GMO protest spreads to cloning

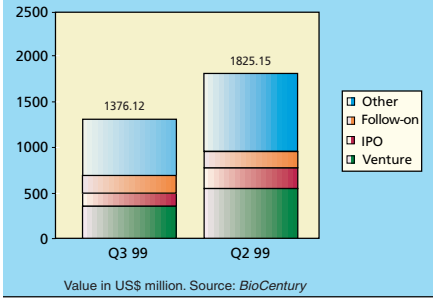
Life, a UK anti-abortion group, has called for a boycott of Sainsbury supermarkets in the UK after comments supporting research into human therapeutic cloning made by Lord David Sainsbury, former chiarman of the supermarket group. Sainsbury, now the UK's minister for science, was speaking at a fringe meeting at the Labour party's annual conference at which the topic had been raised in a presentation by Simon Best of Geron Biomed (Roslin, Scotland).




## Genomics companies strike a deal

Cooperation rather than competition was apparent in genomics at the beginning of October when Millennium Pharmaceuticals (Cambridge, MA) announced nonexclusive access agreements to two databases and genomic tools from Incyte Pharmaceuticals (Palo Alto, CA) and Lexicon Genetics (The Woodlands, TX). While Incyte's LifeSeq Gold database contains around 140,000 human genes, including 50,000 novel genes not available in the public domain, Lexicon's Human Gene Trap Database encompasses thousands of commonly and rarely expressed genes not represented in other databases. Millennium characterized the arrangement as a way of accelerating its access to the complete set of human genes without compromising the company's drug discovery and development efforts. Incyte sees the deal as a milestone in its efforts to sell database access to biotechnology companies as well as to larger companies. Incyte may need new clients as its genomic information becomes commoditized by public genome efforts. Analyst downgrades hit the company's stock price (down nearly 25% to near its yearly low value) at the beginning of October as an earning forecast showed that revenues were down despite the expansion of many of Incyte's database arrangements with large companies.

## Biotech fundraising




Value in US$ million. Source: *BioCentury*

## India challenges gene piracy

In a step toward protecting India's genetic resources, the Indian Council of Agricultural Research (ICAR) has started DNA fingerprinting the plant varieties in its gene bank. "We are doing this to establish proof of origin of the genetic material, in the event of ownership or patent disputes," says ICAR director general, Rajendra Singh Paroda. For instance, ICAR is currently mapping the molecular fingerprints of India's basmati rice, which it claims is unique, in order to challenge the US patent given to RiceTech (Austin, TX) for its aromatic rice variety that is marketed as basmati. And Paroda says India has many unique genes in its gene bank. "Oriza nivara," for instance, is the only germplasm in the world that contains the gene to resist attack by grass stunt virus.

"We have so far profiled some 2,000 out of the 6,000-odd released crop varieties and a few medicinal plants, but we have a tremendous backlog," says KV Bhat, a scientist at National Bureau of Plant Genetic Resources (NBPGR; New Delhi), which operates the gene bank and fingerprinting labs. In addition, DNA probes from many crop species are still under development in his lab, and fingerprinting can cost $125 for each sample.

"It is not possible to fingerprint every plant species or all the 100,000 seed types in our gene bank," says PL Gautam, NBPGR director. So priority has been given to released varieties and parental lines of hybrids, then medicinal plants of great commercial value or on the brink of extinction, and finally seeds that contain genes for such desirable traits as salt or drought tolerance, high yield, or resistance to insects.

## Avanir prepares for sale

Avanir Pharmaceuticals (San Diego, CA), formerly known as Lidak Pharmaceuticals, was delisted from Nasdaq in mid-September after FDA delayed approval and requested more data for the firm's key product, a skin cream for the treatment of herpes infections. Avanir officials say they are preparing for a sale after months of legal battles, regulatory delays, and employee cutbacks. "We will be stepping up negotiations and talks with interested parties," says Patrice Saxon, director of investor relations for the troubled biotech.

In 1998, the board of directors ousted Lidak's founder and CEO David Katz after he tried to arrange a $130 million loan from a financier; the board rejected the agreement (*Nat. Biotechnol.* **16**, 315, 1998). Katz has since sued the directors of the renamed firm over his firing, arguing it was not justified and that his reputation was damaged. Avanir countersued, and a civil trial over damages took place in September in San Diego Superior Court. Company officials allege Katz was a "toxic boss" whose mismanagement cost shareholders $14 million. They also claim he locked employees in a closet for nonperformance.

## Research Collaborations

| Company 1 | Company 2 | $Millions | Details |
|---|---|---|---|
| DuPont Pharmaceuticals (Wilimgton, DE) | Pharmasset Ltd (Tucker, GA) | 30 | A multiyear agreement to develop antiviral compounds against HIV and hepatitis B. In exchange for creating and identifying novel nucleoside reverse transcriptase inhibitors, Pharmasset could receive over $30 million, including an equity investment, upfront payment, research funding, milestones, and royalties. |
| ArQule (Medford, MA) | Bayer (Leverkusen, Germany) | 30 | A three-year combinatorial chemistry collaboration to use ArQule's Custom Array program to design and create compounds for screening against Bayer's therapeutic and agrochemical targets. ArQule could receive $30 million in cash payments for delivery of arrays. |
| Lynx Therapeutics (Hayward, CA) | Hoechst Schering AgrEvo (Frankfurt, Germany) | 25 | AgrEvo aims to develop new crop varieties by studying certain plants using Lynx's DNA analysis technologies. Lynx could receive over $25 million in exchange for DNA analyses, genomic maps, fees for SNP discoveries, and milestone payments. |
| Genome Therapeutics (Waltham, MA) | bioMerieux (Lyon, France) | 6.2 | An agreement to develop infectious disease diagnostic products. For the first year, GT will received $6.2 million in funding, including an equity investment from bioMerieux, which has also purchased a subscription to GT's microbial database. Genetic markers identified from the genomic sequence information in this database will be used to develop diagnostics. |
| Isis Pharmaceuticals (Carlsbad, CA) | Rhône-Poulenc Rorer (Collegeville, PA) | * | A three-year collaboration using Isis's antisense target-validation technology to asses genes identified in PRP's genomics programs. RPR and Isis will use resulting target information to develop pharmaceutical products and antisense drugs, respectively. |
| Cell Genesys (Foster City, CA) | Rigel (Sunnyvale, CA) | * | A cancer gene therapy collaboration whereby Rigel will identify novel therapeutic genes using its functional genomics technology. CG will have exclusive worldwide rights to these genes in the field of gene-therapy; Rigel will be able to access certain of CG's patents and retroviral gene delivery technology to use in functional genomics. |

*financial details not disclosed