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Institutions in Crisis

A SYNERGISTIC UNION OR SELLING OUT?

University-Industry Relations, Biotechnology, and the UC-Berkeley/Novartis Partnership

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In November 1998, the University of California-Berkeley signed a five-year, $25 million research agreement with Novartis Agricultural Discovery Institute, a subdivision of the pharmaceutical and agribusiness giant Novartis, Inc. The arrangement would give Berkeley's Department of Plant and Microbial Biology access to research funds as well as to Novartis' genetic sequencing databases. In return, Novartis held first rights to patent discoveries made over the five-year period. To the department's researchers, the deal was a bigger and better version of arrangements with which science faculty had long been familiar. Critics, however, accused UC-Berkeley of compromising academic freedom and scientific integrity. Was the university fulfilling its historic mission, pursuing knowledge and discovery while serving the citizens of California? Or was it "selling out" its independence and objectivity to big business?

This case considers the Berkeley-Novartis agreement in light of the modern research university's struggle to balance competition for resources against traditional expectations regarding higher education's appropriate role in society. The case also illustrates how the unique organizational features of universities impact and react to shifts in organizational mission and changes in the distribution of resources.

Introduction

Berkeley plant biologist Wilhelm Gruissem's work to understand the pathways and molecules involved in plant growth depended, like all his colleagues in biology, on a continued flow of money—money to attract and pay promising graduate students and to purchase enzymes, primers, lab equipment and DNA sequencing software. The day UC-Berkeley formally signed a five-year, $25 million funding agreement with pharmaceutical and agribusiness giant Novartis in late November 1998 should have been a day of unmitigated celebration. Gruissem had helped spearhead the partnership, quickly negotiating the terms of the agreement over the summer months. His colleagues in the Department of Plant and Microbial Biology (PMB) at Berkeley would be the direct recipients of two-thirds of the $25 million. From PMB's perspective, the deal was just a bigger and better version of arrangements with which all researchers were familiar—money would be distributed among the faculty through an allocation process based on merit. In exchange, Novartis would receive the first right of refusal on departmental patents. Yet in the weeks leading to the signing of the agreement, Gruissem and those who had worked on the deal were accused of sacrificing scientific integrity to corporate interests. At the signing ceremony, Gruissem watched as his colleague Gordon Rausser narrowly dodged pumpkin pies thrown by protesters.

Was the university fulfilling its historic mission, pursuing knowledge and discovery while serving the citizens of California? Or was it selling out to big business? Will universities and industry ever be able to partner in ways that do not undermine, or give the appearance of undermining, the university's presumed scientific objectivity? The sense of crisis generated by the Berkeley-Novartis partnership reveals contestation within the institution of higher education over the mission and purpose of the university in modern society and higher education's relationship with other social institutions. Features of this case also illustrate how the unique structural features of the American university, and the broader institution of higher education, mediate changing resource conditions and social expectations.

Background and Context

Establishment of Public and Land Grant Universities

American higher education originated in the late 17th century with private colleges operating to conserve and transmit religious learning. Individual states began to support public colleges and universities[1] a century later, with the University of North Carolina and the University of Georgia constructed in the 1780s. Federal support of higher education commenced in the 1862 Morrill Act. This legislation endowed states with grants of western land from which the sale and proceeds were used to establish public universities offering programs in the "agriculture and the mechanical arts." The Morrill Act represented the largest single allocation of resources for higher education in U.S. history, and it established two missions for the American university in addition to teaching—scientific research and public service. Land grant universities were expected to be central nodes in a growing network of public universities designed to respond to local economies and needs.

For a century after their establishment, the primary need of local communities centered around agriculture, and thus much of the early research and training activities of land grant universities focused on the needs of farmers. Two additional federal actions further cemented the central role of state land grant universities in their partnership with farmers. The Hatch Act of 1887 established a series of State Agricultural Experiment Stations, thus creating a framework for the systematic, and publicly financed, application of science to agricultural problems. The stations were (and continue to be) joint programs between federal and state departments of agriculture and land grant

[1] Universities are distinguished from colleges by the former's graduate education programs.

universities. A second piece of legislation, the 1914 Smith-Lever Act, added a formal technology-transfer component to the university. Smith-Lever created state-funded agricultural extension agents who advised farmers and served as liaisons between the farmer and university researcher. The relationship between the state and federal agricultural agencies, university scientists, extension agents, and the farmer was a key contributor to the "Green Revolution" in agricultural production in the mid-20th century. Between the 1930s and 1950s, the development of hybrid grains and powerful chemical herbicides and pesticides led to a doubling and tripling of crop yields.

Organizational Features of American Higher Education

The land grant universities were but one type of educational organization added to the varied landscape of higher education in the U.S. Unlike the centralized and state-directed systems typical of European countries, higher education in America exists outside of direct federal control. Rather than an organized system, American higher education operates as a conglomeration of public and private colleges and universities of varying size and scope operating in a competitive education marketplace.

State political leaders have expected public universities to respond to state needs—to provide workforce training, practical research applications, and assistance to business. Yet the university is not an arm of the state bureaucracy, and while universities receive supplemental state funding and benefit from their tax exempt status, they must also prevail in the competitive higher education market. Universities compete for students and their tuition (as well as future alumni dollars), for productive faculty members, and for government and foundation research funds.

The competitiveness of a university ultimately depends on the quality of its faculty. Higher education scholar Burton Clark calls this feature of universities "bottom heaviness," where the power of the "operating units" (the academic departments), and thus the university as a whole, is largely derived from faculty members' command of esoteric knowledge.[2] The academic departments within universities around which faculty are organized are also, to some degree, in internal competition with each other to attract students, tuition, and support from the university administration.

Colleges and universities have traditionally been governed "collegially," with faculty, administration, and trustee boards all sharing in decision-making. Faculty contribute to university decision-making in several ways: through their roles as temporary administrators—for example, rotating as head of their departments—through permanent governance entities such as academic senates, and by organizing and serving on study groups and committees that regularly consider the direction the university should take in its efforts to both satisfy expectations for its public mission and successfully compete for resources. The federation of the university into varied academic and administrative entities and the role of shared governance within and across units comprise organizational features unique to the institution of higher education.

Modern Biotechnology and Agricultural Research

Biotechnologies have the potential to dramatically reduce the time required from the initiation of work on a desired plant trait to its commercial production in the field. Traditionally, plant breeders collected genetic material and recombined these through manual cross-pollination to create high-yield hybrids. Manipulation of genetic material at the cellular and molecular levels obviates manual pollination. The first step in genetic enhancement, however, is the long and expensive process of decoding (sequencing) the genome of plants. Once the genome is decoded, work begins to determine which genes are associated with which traits, and then to select for those traits. The most controversial area of research in agricultural biotechnology is in transgenics—the creation of plants derived from the

[2] Clark, Burton. 1986. *The Higher Education System: Academic Organization in Cross-National Perspective.* Berkeley: University of California Press.

combination of completely unrelated organisms. Plants could theoretically be bred not only for disease or drought resistance, but to produce vaccines or other pharmaceuticals, or to contain greater cellulose content to serve as fodder for biofuel production.

Despite the promise of biotechnology to revolutionize the practice and economics of agriculture, U.S. agricultural biotech is represented by just two genetically modified (GM) traits in a handful of crops. In 2003, four crops accounted for nearly 100% of the acreage of GM agricultural products in the U.S.: soybeans, corn, cotton, and canola, and only two GM traits—herbicide (Roundup) tolerance, and Bt insecticidal action—were represented.[3] "Roundup Ready" crops, first developed by Monsanto in 1996 for soybeans, contain a gene that makes the crop resistant to the company's powerful herbicide Roundup. The second widely used GM product is Bt corn, developed by Ciba-Geigy in the mid-1990s. Bt seed corn is made insect-resistant by inserting into the corn genome the soil bacterium *Bacillus thurnigiensis*, which is toxic to the European Corn Borer.

Though the use of genetic modifications in agricultural production remains limited, many scientists believe biotechnology holds great promise. As Robert Goldberg, UCLA professor of cell, molecular and developmental biology stated, "We are already able to design plants containing better nutrients for human consumption, plants that are insect-resistant.…[Biotechnology research] will change the economics of agriculture. And these changes will greatly benefit mankind and the environment."[4]

Agricultural biotech poses a number of difficult unresolved questions, however. These span the gamut from environmental issues, whereby genetically modified crops may endanger the survival of entire ecosystems; to human health and the unknown long term impacts of the consumption of genetically modified foods; to economic and social justice claims that farming based on biotech strips farmers of control and increases dependence on agribusiness. Critics of agricultural biotech note that instead of designing plants with sustainability in mind, agribusiness companies seek to engineer plants which make the farmer more dependent upon purchased inputs.[5]

Resources and the Research Environment

At the same time that the science of plant genetics was rapidly advancing, changes occurred in the legal and policy environment which influenced research in the biological sciences. The Bayh-Dole Act of 1980 was the most well-known of these policy initiatives. The legislation permitted university researchers to patent discoveries made using government research funds. More consequentially, the act legitimized university involvement in the marketization of discovery. Historians view Bayh-Dole and related policies initiated during the 1980s as a response to the perception that the U.S. was waning as a global economic power. Universities were seen as underutilized resources and one promising way for the U.S. to reassert its economic leadership.[6] Policies like Bayh-Dole were crafted to be behavioral levers that would evoke the entrepreneurial side of university researchers, incentivizing them to bring

[3] In 2002, 32% of corn, 71% of soybeans, and 70% of cotton were planted as Bt and/or herbicide resistant varieties. Kloppenburg, Jack Ralph, Jr. 2004. *First the Seed: The Political Economy of Plant Biotechnology, 1492-2000.* Madison, WI: University of Wisconsin Press. Page 395.

[4] Woon, Caroline and Daily Bruin. "U-C Berkeley-Novartis Partnership Prompts Investigation." *University Wire* (May 23, 2000).

[5] One of the benefits of "Roundup Ready" plants was to have been a reduction in the amount of herbicide used. Farmers using Roundup Ready, however, have been found to use 2-4 times more herbicide than those who do not use it. Kloppenburg, Jack Ralph, Jr. 2004. *First the Seed: The Political Economy of Plant Biotechnology, 1492-2000.* Madison, WI: University of Wisconsin Press. Page 316.

[6] Mowery et al.'s comprehensive study of the effects of Bayh-Dole questions claims that the act had any significant impact on economic growth. The authors also find that the act had little impact on the research orientation of university faculty. In particular, they do not find that researchers switched to more "applied" research in order to derive more patentable information. Mowery, David C., Richard R. Nelson, Bhaven N. Sampat, and Arvids A. Ziedonis. 2004. *Ivory Tower and Industrial Innovation: University-Industry Technology Transfer Before and After the Bayh-Dole Act in the United States.* Stanford, CA: Stanford University Press. Page 184..

potentially commercializable ideas to the market.[7] During the 1980s, legislation in the form of favorable tax laws also encouraged industry to seek out university partners. Some individual states have continued to provide added incentives to industry. For example, in the mid-1990s California doubled the tax credit for business investments in university research, from 12 to 24%.[8]

The idea of generating "synergies" between business and academia has been institutionalized within universities in the form of offices of technology transfer and at the periphery of the university as research and industrial parks and business incubators. These boundary institutions increasingly constitute an "industrial penumbra" around major research universities.[9] The growth of professional organizations—the Association of University Technology Managers, the Association of University Research Parks, the National Business Incubation Association—further legitimize and institutionalize university-industry connections.

While the idea of patenting discovery and university-industry partnerships was formally legitimized via legislation in the 1980s, land grant universities have long had technology transfer as a part of their mission. More consequential for the conduct of agricultural, particularly bio-agricultural, research were changes in the definition of intellectual property and what could legally be patented.[10] Legal decisions from the 1920s on relaxed the patent threshold on biological discoveries. With advances in genetic science the theoretical possibility of patenting new life forms became reality. Just as consequential was the new legality of patenting genetic *potential*. Researchers can patent not only new life forms, but the genomes (the painstakingly-derived DNA codes) for existing plants and animals. What had been considered the basis for the issuance of a new patent—knowledge and specific technologies with immediately commercializable features—was expanded to include basic knowledge (e.g., genomes) that held only the potential for commercialization. [11]

While the ability to patent knowledge clearly incentivized the biotech industry, which has engaged in a race to sequence and lay claim to plant and animal genomes, critics argue that the unintended effect of the privatization of knowledge has been an ultimately slower pace of discovery and encouragement of research that is not in the public interest. Commenting on the National Institute of Health's efforts to sequence and patent genetic material, Human Genome Project Director Francis Crick noted, "Every piece we get, it's like saving another block from

[7] Mowery, et al. (2004) also note that while tech transfer has become a part of the university landscape, most tech transfer offices barely break even, and the majority of invention disclosures do not culminate in a license that generates royalties for the inventor/professor or for the university. Mowery, David C., Richard R. Nelson, Bhaven N. Sampat, and Arvids A. Ziedonis. 2004. *Ivory Tower and Industrial Innovation: University-Industry Technology Transfer Before and After the Bayh-Dole Act in the United States.* Stanford, CA: Stanford University Press. Colyvas and Powell (2006) argue that the installation of university technology transfer offices are more of a means of signaling legitimacy—of indicating that the university is modern, forward-thinking, and performing a public service—than it is a way to earn income for the university. Colyvas, Jeannette A., and Walter W. Powell. 2006. "Roads to Institutionalization: The Remaking of Boundaries Between Public and Private Science." *Research in Organizational Behavior* Volume 27: 305-353.

[8] Rausser, Gordon. 1999. "Public/Private Alliances." *AgBioForum* 2(1): 5-10. Page 9.

[9] Etkowitz, Henry. 1998. "The Norms of Entrepreneurial Science: Cognitive Effects of the New University-Industry Linkages." *Research Policy* 27:823-833.

[10] Kloppenburg, Jack Ralph, Jr. 2004. *First the Seed: The Political Economy of Plant Biotechnology, 1492-2000.* Madison, WI: University of Wisconsin Press.

[11] Sheldon Krimsky discusses the evolution of intellectual property law in chapter 4 of *Science in the Private Interest: Has the Lure of Profits Corrupted Biomedical Research?* Lanham, Maryland: Rowan and Littlefield. He notes that the ability to patent individual genes was derived from the logic that they were isolated and modified chemicals, regardless of the fact that they were also the basic constituents of living things. Also see Mowery, David C., Richard R. Nelson, Bhaven N. Sampat, and ARvids A. Ziedonis. 2004. *Ivory Tower and Industrial Innovation: University-Industry Technology Transfer Before and After the Bayh-Dole Act in the United States.* Stanford, CA: Stanford University Press.

speculators."[12] In a 2000 survey of geneticists, 73% said that they had experienced difficulty in obtaining access to data or materials from other scientists and that this had slowed scientific progress in the field.[13]

At the same time that policy was encouraging privatization of genetic knowledge and collaboration between university and industry, government funding of university research was declining. Generous federal support of research during the golden age of "big science,"—for military science in the 1940s continuing through the Sputnik-era push to fortify basic scientific research—waned in the 1970s and 1980s. Despite the drop in the pace of funding since WWII, federal funds continue to supply the majority of research support to universities. The level of industry funding for university research has remained between 5 and 7% annually over the past several decades.[14]

From Biology to Life Science: Universities and Industry in the Age of Biotechnology

An understanding of genetics has increasingly constituted both the foundation of biology as a science and informed cutting edge research in the discipline. Advances in genetics and the associated areas of biochemistry, cell biology, and molecular genetics established the underlying similarities among all organisms, disrupting traditional departmental taxonomic divisions. At the same time, environmentalism contributed to a greater interest in the study of the interaction and interdependence among plants and animals. The study of systems of biological organisms and their relation to agricultural production contributed to the burgeoning research areas of "agroecology" and sustainable agriculture.

At Berkeley, the development of the biological sciences represents a geological layering reflecting different historical perspectives on the discipline.[15] Botany (established 1890), Entomology and Parasitology (est. 1891), Plant Pathology (est. 1903), Bacteriology (est. 1911), Biochemistry and Virology (est. 1948), and Molecular Biology (est. 1964) were each added to the department of biology. In the late 1970s and early 1980s, leading biologists at Berkeley acknowledged that organizational disarray in the biological sciences was likely contributing to a slip in Berkeley's reputation in the area, affecting its ability to attract promising young scientists as either graduate students or new professors.[16] A reorganization in the 1980s was designed to enhance the connections among researchers who were studying similar things and using similar research techniques.

Some 20 distinct departments were reorganized into 4 large departmental groupings. The Department of Molecular and Cell Biology, focused on basic genetics research and housing approximately 80 faculty, along with the Department of Integrative Biology, specializing in the study of whole organisms and populations and with approximately 40 faculty, were housed within the College of Letters and Science. The Department of Plant and Microbial Biology (PMB), with approximately 30 faculty specializing in plant genetics, along with the Department of Environmental Science, Policy, and Management, with about 60 faculty working in economics, policy, and

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[12] Kloppenburg, Jack Ralph, Jr. 2004. *First the Seed: The Political Economy of Plant Biotechnology, 1492-2000.* Madison, WI: University of Wisconsin Press. Page 325.

[13] Campbell, Eric, Brian Clarridge, Manjusha Gokhale, Lauren Birenbaum, Stephen Hilgartner, Neil Holtzman, and David Blumenthal. 2002. "Data Withholding in Academic Genetics: Evidence from a National Survey." *Journal of the American Medical Association* 287: 473-480. The objective of university researchers has been both discovery and the dissemination of discovery through publication in peer-reviewed academic journals. The data presented in these publications has traditionally been freely available to all so that it could then be used for further inquiry.

[14] Rapoport, Alan. 2006. "Where Has the Money Gone? Declining Industrial Support of Academic R&D." *InfoBrief*, NSF 06-328. Washington, D.C.: National Science Foundation. Bok, Derek. 2003. *Universities in the Marketplace: The Commercialization of Higher Education.* Princeton: Princeton University Press. Page 60.; Krimsky, Sheldon. 2003. *Science in the Private Interest: Has the Lure of Profits Corrupted Biomedical Research?* Lanham, MA: Rowan & Littlefield. Page 79.

[15] Trow, Martin. 1999. *Biology at Berkeley: A Case Study of Reorganization and Its Costs and Benefits.* Research and Occasional Paper Series: CSHE.1.99. University of California Berkeley: Center for Studies in Higher Education.

[16] Ibid, Page 5. As Martin Trow wryly notes in his historical review of the study of biology at Berkeley, "There is nothing that so concentrates the mind of a senior academic administrator at Berkeley—and I dare say of their counterparts elsewhere—more than to hear that a department is slipping."

management of biological resources, were housed in the College of Natural Resources. In 1998, at the time that PMB began a research relationship with Novartis, it had 32 faculty members, 110 post-doctoral researchers, and 70 graduate students.[17] The PMB web homepage and the mission statement for the College of Natural Resources are provided in Appendices A and B.

While biological sciences were being reorganized within universities, the rise of biotechnology prompted a revolution of a different kind within industry. Chemical and pharmaceutical companies discovered synergies with agribusiness and health concerns, and mergers and acquisitions revolved around the common denominator of gene sequencing and biotechnology. Monsanto was particularly aggressive in the late 1990s, acquiring smaller genetic research firms to acquire new techniques for gene discovery and transformation, gene libraries and databases, and plant germplasm.[18] Monsanto, Dupont, Pioneer, and Novartis dominated the science and commerce of seed and plant production in the late 1990s.[19] In the area of genetic discovery, it is estimated that these four companies spent a collective $1.5 billion on plant genome sequencing in the 1990s. This compared to an estimated $40 million spent on genetic sequencing by the federal government (including federal research grants to universities) during the same period.[20]

Novartis, Inc.

Novartis emerged from the 1996 merger of two chemical and pharmaceutical companies, Ciba-Geigy and Sandoz. Novartis employs 87,000 people in more than 100 countries. With the merger it became simultaneously the world's second largest pharmaceutical company, the largest agrochemical company, and one of the top five companies working in nutritional products and supplements. The company has held patents on products as diverse as Maalox (an over-the-counter antacid), Ritalin (a pharmaceutical treatment for attention deficit disorder), and AGIL (a soybean insecticide). Like its rivals, Novartis had surveyed the business landscape and determined that genetic science was the obvious common dominator across its profit centers of agriculture, nutrition/health, and pharmaceuticals.[21] Compared to the other corporate "gene giants,"[22] however, the company was a relative newcomer, and it trailed others in spending on biotechnology.

As part of its attempt to catch-up in biotech, Novartis devised a novel plant genomics research facility in 1997. The Novartis Agricultural Discovery Institute (NADI) was designed to be a "Bell labs" of plant biotech, a place where scientists could engage in fundamental research buffered from more short-term corporate interests.[23] The director of NADI, Steven Briggs, held a Ph.D. in plant pathology and had been a director of research at Pioneer Hi-Bred. The new La Jolla, California, research facility was staffed with 180 scientists in 1998. While the institute would conduct its own research, management hoped to quickly move along the biotech learning curve by aggressively cultivating a web of relationships with external companies and with academia.

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[17] Lau, Edie. "Cal, Biotech Firm Strike Unique Deal." *Sacramento Bee* (November 23, 1998).
[18] West, Jonathan and Christian G. Kasper. 2000. *Novartis Agricultural Discovery Institute, Inc (A).* Cambridge, MA: Harvard Business School.
[19] Kloppenburg, Jack Ralph, Jr. 2004. *First the Seed: The Political Economy of Plant Biotechnology, 1492-2000.* Madison, WI: University of Wisconsin Press.
[20] Lau, Edie. "Cal, Biotech Firm Strike Unique Deal." *Sacramento Bee* (November 23, 1998). Estimate by William Gruissem, Berkeley PMB faculty member and director of the Novartis-Berkeley alliance.
[21] Eaton. Margaret L. 2004. *Novartis-UC Berkeley Research Collaboration.* Case MBE-7. Stanford, CA: Stanford Graduate School of Business. West, Jonathan and Christian G. Kasper. 2000. *Novartis Agricultural Discovery Institute, Inc (A).* Cambridge, MA: Harvard Business School.
[22] Kloppenburg uses the term "gene giants" to refer to the dominant life sciences corporations in his critical history of plant biotechnology, *First the Seed: The Political Economy of Plant Biotechnology, 1492-2000.* 2004. Madison, WI: University of Wisconsin Press.
[23] Rudy, Alan P., Dawn Coppin, Jason Konefal, Bradley T. Shaw, Toby Ten Eyck, Craig Harris, and Lawrence Busch. 2007. *Universities in the Age of Corporate Science: The UC Berkeley-Novartis Controversy.* Philadelphia: Temple University Press, Pages 50-52. Eaton. Margaret L. 2004. *Novartis-UC Berkeley Research Collaboration.* Case MBE-7. Stanford, CA: Stanford Graduate School of Business. Page 10.

The Berkeley-Novartis Partnership [24]

In response to the emerging importance of genetics in the biological sciences, Berkeley Chancellor Chang-Lin Tien organized a Biotechnology Advisory Board in 1994 to discuss possible university strategy. One of the board participants was plant biology professor Wilhelm Gruissem.

Over the next few years, Wilhelm and his colleagues in PMB brainstormed possible ways for the department to attract funding in the coming years to keep its research cutting-edge. In keeping with this effort, Gruissem organized an International Biotechnolgoy Advisory Board consisting of 14 representatives from industry. His initial idea was to have the companies contribute $10,000 each to support the work of PMB graduate students. These plans did not generate the hoped-for funding, however.

In 1997, Gruissem helped organize a faculty working group to consider other possible sources of funding for PMB. The committee consisted of himself, PMB professor Bob Buchanan, Cooperative Extension specialist Peggy Lemaux, and agricultural economist and Dean of the College of Natural Resources Gordon Rausser. At Rausser's suggestion, the group agreed to employ a fundraising technique to which they themselves had often been on the receiving end—the Request for Proposal (RFP). Typically, faculty write research proposals in response to RFPs issued by government agencies or private foundations. These RFPs call on scientists to propose a budget and strategy to fulfill objectives specified by the granting unit and to convince the grantor that they are the best qualified for the given task. The PMB working group agreed to adopt this method but with a twist: PMB would design an RFP and then call upon private companies to apply if interested. The key provision entailed an exchange of funds for licensing rights: companies would fund PMB research and in exchange hold the rights to patent any discoveries. Rather than faculty tailoring their proposals to given specifications, PMB was turning the tables, and in doing so giving the faculty greater control (Rausser and his colleagues believed) than they would have had otherwise.

PMB sent a letter of inquiry to 16 companies in the spring of 1998. Four expressed interest, and Gruissem and Rausser made presentations to each. PMB subsequently received three formal proposals: from Monsanto, NADI, and a joint proposal from DuPont and Pioneer. Company representatives met with PMB faculty and the UCB chancellor and vice chancellor. At the end of a self-imposed 30-day deadline, PMB sent a letter of intent to NADI. Gruissem noted that NADI was chosen from among the three contenders because it "most closely aligned with our academic and public-university mission.[25] For its part, NADI saw the PMB relationship as a way "to accelerate the rate of discovery…beyond what we could do with our limited staff and facilities at the time."[26]

PMB and NADI agreed to have a draft agreement completed within a month. This first draft was negotiated by PMB scientists, two senior researchers from NADI, two senior administrators from the Office of Technology Licensing at UB, and two attorneys from Novartis. The fact that Berkeley involved the Office of Technology Licensing at this stage was later seen as unusual. Typically the Sponsored Projects Office would have taken the lead.[27] The draft,

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[24] A time line of major events appears in Appendix C. A number of the chronological details in this section are drawn from the external review report commissioned by UC-Berkeley and carried out by social scientists at the University of Michigan (Busch et al. 2004) and by the book informed by this review report (Rudy et al. 2007). Busch, Lawrence, Richard Allison, Craig Harris, Alan Rudy, Bradley T. Shaw, Toby Ten Eyck, Dawn Coppin, Jason Konefal, Christopher Oliver, & James Fairweather. *External Review of the Collaborative Research Agreement between Novartis Agricultural Discovery Institute, Inc., and The Regents of the University of California.* July 13, 2004. Rudy, Alan Pl, Dawn Coppin, Jason Konefal, Bradley T. Shaw, Toby Ten Eyck, Craig Harris, and Lawrence Busch. 2007. *Universities in the Age of Corporate Science: The UC Berkeley-Novartis Controversy.* Philadelphia: Temple University Press.

[25] Blumenstyk, Goldie. 1998. "Berkeley Joins Swiss Company in Controversial Technology-Transfer Pact." *The Chronicle of Higher Education*. (December 4, 1998).

[26] From an interview with a NADI employee involved with the agreement, reported in Rudy, Alan P., Dawn Coppin, Jason Konefal, Bradley T. Shaw, Toby Ten Eyck, Craig Harris, and Lawrence Busch. 2007. *Universities in the Age of Corporate Science: The UC Berkeley-Novartis Controversy.* Philadelphia: Temple University Press. Page 112.

[27] Ibid. Pages 52-53.

completed by June 1, was then passed on for review to the UC Office of the President, the University of California general counsel, and to Novartis corporate headquarters.

Negotiations continued over the next few months, and during that time four meetings of the PMB faculty were held to discuss the agreement. There appears to have been some initial reservations within PMB because of the arrangement's scope—specifically the idea that the entire department would be "under contract" to corporate giant Novartis.[28] Over time this initial reluctance faded, however, and there is little evidence that PMB faculty were resistant to the partnership. As Rausser noted, "The beauty of the Novartis alliance [was] that it place[d] the choice of research projects under faculty control, rather than leaving critical decision-making to legislators, bureaucrats, or corporate employees….Even taxpayer research funding comes with some strings attached." [29] Despite emerging opposition outside of PMB (discussed below) the agreement came together quite quickly and was in its final form by October. All but two of the PMB faculty signed on to the agreement (signing was optional).

During the negotiations, the university entity formally designated as partner to NADI shifted from PMB to the College of Natural Resources (CNR), of which PMB was a part. While PMB was clearly the recipient of most of the funds, with two-thirds of the annual $5 million going directly to PMB research activities, one-third remained 'unencumbered,' meaning that the designated partner could use the funds at will. Cognizant of CNR's need for such unencumbered funds, Dean Rausser made CNR the contracting entity rather than PMB. In addition to financial concerns, Rausser argued that CNR had more resources for handling any media attention that the agreement might draw.

Provisions of the Agreement

The final agreement established the terms of the relationship between CNR and NADI. NADI would give CNR $25 million over a period of five years to conduct plant genetics research. Two-thirds of this amount would support research in PMB, and the remaining one-third would go to CNR to be spent at will. The research funds would be distributed annually on a competitive basis to PMB faculty who would submit proposals to a five-member research committee. The committee would be composed of three PMB faculty and two NADI representatives. In early drafts of the agreement, the committee was comprised of only faculty, but at PMB's request NADI representatives were added because it was thought this would be beneficial for research. NADI would provide access to its proprietary technology and DNA databases, though faculty were required to sign a confidentiality agreement for their use. NADI would receive first rights to negotiate for 30-40% of discoveries made in the department. This included not only the possibility of patenting discoveries made with Novartis-funded research but any other research in PMB. This percentage reflected the proportion of the total departmental research budget contributed by NADI. NADI would pay for the costs of patenting discoveries, but the university would own all patents and collect royalties from NADI for their use. NADI would also hold the right to access research before publication—it would have 30 days to review research publications and could delay publication for an additional 90 days.[30] (Major provisions of the agreement are given in Appendix D.)

Support and Opposition

By the time the fall semester began, the negotiations for the Berkeley-Novartis partnership were in their final stages. News of the agreement had not yet reached the many students and faculty who had been away from campus during the summer, however. Once everyone returned, voices of opposition began to circulate. A number of first-

[28] Eaton. Margaret L. 2004. *Novartis-UC Berkeley Research Collaboration.* Case MBE-7. Stanford, CA: Stanford Graduate School of Business.
[29] Rausser, Gordon. 1999. "Public/Private Alliances." *AgBioForum* 2(1): 5-10. Page 8.
[30] "Questions and Answers on the UC Berkeley-NADI Research Agreement." UC Berkeley news release (November 23, 1998). http://berkeley.edu/news/media/releases/98legacy/qanda.html. Also see Appendix A.

year students in the Department of Environmental Science, Policy and Management, also a part of the College of Natural Resources, were the first and most vocal opponents, and they organized the group Students for Responsible Research (SRR). The group questioned the alliance and the message it sent to those outside of the university: "This deal promotes a narrow focus on profit-oriented and controversial biotechnological research that contrasts with the College of Natural Resources' stated goals of sustainability, protection of the environment, and food safety."[31] SSR brought outside media attention to the Berkeley-NADI partnership, with its members contacting local and state newspapers as well as spreading the word among environmental groups opposed to biotechnology. The SSR collected 400 signatures on a petition requesting that the Berkeley-NADI agreement be amended (see Appendix E), but this petition was effectively ignored.[32]

A second source of opposition came from the CNR Executive Committee (Ex-Com), an advisory committee to which Rausser appealed for support. Several committee members objected to having been made parties to an agreement to which they had not had any input and about which they had little knowledge. As one Ex-Com member noted, "Since we [the Ex-Com] are advisory, I think that it was important for [Rausser] to have some stamp of approval of the faculty, and we, being representatives of the faculty, could have easily legitimized it….[But] it didn't happen that way. We questioned it right away."[33] Chair of the Ex-Com and assistant professor in the Department of Environmental Science, Policy, and Management Ignacio Chapela became the most vocal faculty critic of the partnership and was frequently quoted in the press.

Rausser also sought a quick stamp of approval from the university-wide Academic Senate, although he was not under any formal obligation to do so. The Academic Senate formed a working group in late August to study the partnership. Like a number of faculty in CNR, many in the Senate did not want to endorse a deal that was proving to be controversial and to which they had had neither contributed to arranging nor from which they would directly benefit.

One source of criticism was the way in which Berkeley had originally teamed with NADI. Gruissem and Rausser argued that their use of a request for proposal format gave Berkeley more negotiating power and greater academic authority. The partnership represented "synergies in the discovery process," which simultaneously brought much needed funds to the department.[34] Critics, however, characterized the process as a debasing "auctioning off" of an academic department. References to UC-Berkeley being "in bed" with industry were made and the analogy was repeated in a widely read 2000 article in *The Atlantic Monthly*, entitled "The Kept University." CNR associate professor Ignacio Chapela, among others, argued that the sheer scope of the agreement—the "capture" of an entire academic department—was one of the biggest problems: "I'm not opposed to individual professors serving as consultants to industry," he said. "If something goes wrong, it's their reputation that's at stake."[35] Faculty also chafed at the apparent attempt to control their interactions with the press. As opposition to the agreement became evident, Rausser sent an email advising faculty to direct any media calls to the CNR administrative offices.

Critics also objected to the wider precedence that the agreement set for university research. "This deal institutionalizes the university's relationship with one company, whose interest is profit. Our role should be to serve the public good," noted Chapela.[36] California State Senator Tom Hayden called a legislative hearing in May

[31] Elias, Thomas D. "Pies Fly Over University's Deals on Genetically Altered Foods." *The Washington Times* (December 4, 1998).
[32] Rudy, Alan P., Dawn Coppin, Jason Konefal, Bradley T. Shaw, Toby Ten Eyck, Craig Harris, and Lawrence Busch. 2007. *Universities in the Age of Corporate Science: The UC Berkeley-Novartis Controversy.* Philadelphia: Temple University Press. Pages 56-57.
[33] From an interview with CNR professor of ecosystem science, Andrew Gutierrez, reported in Rudy, Alan P., Dawn Coppin, Jason Konefal, Bradley T. Shaw, Toby Ten Eyck, Craig Harris, and Lawrence Busch. 2007. *Universities in the Age of Corporate Science: The UC Berkeley-Novartis Controversy.* Philadelphia: Temple University Press. Page 56.
[34] Rausser, Gordon. 1999. "Public/Private Alliances." *AgBioForum* 2(1): 5-10. Page 5
[35] Press, Eyal and Jennifer Washburn. 2000. "The Kept University." *The Atlantic Monthly* (March 2000). Page 40.
[36] Ibid.

2000 and questioned the propriety of the alliance, specifically calling the sharing of seats on the research advisory committee (with three PMB and two NADI representatives) a "shameful" example of oversight for a public university. Hayden also challenged Berkeley's focus on bio-agricultural research: "Is genetic engineering so valuable that Californians wish to lose natural foods and agriculture? Is anybody studying the adverse effects?" [37]

Rausser countered that the agreement did "not mean less research into natural food production methods. These fields are not mutually exclusive."[38] For Rausser and PMB faculty, the agreement held financial advantages that contributed to the integrity of the department's research and its standing in the discipline. Rausser noted, "Without modern laboratory facilities and access to commercially developed proprietary databases…we can neither provide first-rate graduate education nor perform the fundamental research that is part of the University's mission."[39] PMB professor Russell Jones concurred: "This is how science is today…You cannot do it with a piece of string and a piece of chewing gum anymore. You have to have this highly technical infrastructure and this is what we got out of [the NADI partnership]."[40] According to supportive PMB faculty, information would also be flowing both ways: the agreement gave professors and students in PMB access to Novartis' extensive database of sequenced plant genomes. Noted PMB faculty member Bob Buchanan said, "We waste a lot of taxpayer money paralleling what is being done in private industry. In many cases, the work is done [in industry] but we won't have access to it." [41]

On October 2, Rausser held a CNR "town hall" meeting to provide details of the partnership and the nearly finalized agreement. The Academic Senate sent a list of questions to Vice Chancellor Carol Christ on October 6, and she replied on October 16. Senate members were disappointed at Christ's reply, characterizing her answers as "evasive…assuring us all would be well, or [telling] us we didn't know what we were talking about."[42] On November 18, the senate informed Christ that it "[could not] fully endorse the Novartis agreement at this time as there are core issues which have not been, and perhaps cannot be, adequately addressed."[43] On November 23, CNR and Novartis formally signed the five-year agreement.

Post-Script

Two years after Berkeley and Novartis began their partnership, Novartis spun off its agribusiness arm to form Syngenta and renamed NADI the Torrey Mesa Research Institute (TMRI). The terms of the agreement between Berkeley and Torrey remained the same. The partnership concluded in 2003. In early 2004, Syngenta ended all research activities at TMRI, moving TMRI employees to research and production facilities in San Diego and Raleigh, North Carolina. These developments were seen as a strategic response to the end of California's biotechnology boom of the late 1990s and to falling revenues across the life sciences industry.[44]

When the Academic Senate became involved with the Berkeley-NADI partnership in the fall of 1998, it made a request that an external review of the agreement and its outcomes be conducted. Sociologists at the University of

[37] Evans, Will. 2000. "Senators Blast Agreement." *The Daily Californian.* (May 16, 2000). Rausser countered that the low amount of resources from the state puts the dept in that position.
[38] Elias, Thomas D. "Pies Fly Over University's Deals on Genetically Altered Foods." *The Washington Times* (December 4, 1998).
[39] Rausser, Gordon. 1999. "Public/Private Alliances." *AgBioForum* 2(1): 5-10. Page 6.
[40] Rudy, Alan P., Dawn Coppin, Jason Konefal, Bradley T. Shaw, Toby Ten Eyck, Craig Harris, and Lawrence Busch. 2007. *Universities in the Age of Corporate Science: The UC Berkeley-Novartis Controversy.* Philadelphia: Temple University Press.
[41] Cha, Arianna Enujung. "UC-Berkeley Deal with Biotech Firm Raises Ethical Issue." *San Jose Mercury News* (November 11, 1998).
[42] Rudy. Page 57.
[43] Ibid. Page 58.
[44] Vogel, Gretchen. 2002. "Retreat from Torrey Mesa: A Chill Wind in Ag Research." *Science* 298(5601): 2106.

Michigan conducted the review, publishing their final report in 2003 and a book based on this report in 2007.[45] The reviewers did not find any evidence of a loss of academic freedom or control of research results. They found the most significant substantive effect was an increase in funding support for graduate students. Nevertheless, the authors cautioned against similar deals because of the threat to the perceived academic objectivity and integrity of research universities.

In 2006, Berkeley signed on to a $500 million partnership with the global energy company BP. The agreement included construction of an Energy Biosciences Institute on the Berkeley campus. Berkeley, BP, and the University of Illinois at Urbana-Champaign would research carbon-neutral energy including biofuel production. According to the contract, finalized in November 2007, the institute would be divided into "proprietary" and "open" research components. The open component would receive $35 million per year and be overseen by a governing board composed of four representatives from BP and four total members from UC Berkeley, Lawrence Berkeley National Laboratory, and the University of Illinois. The proprietary component would be wholly managed by BP, which would rent space on the Berkeley campus. Those in opposition called the partnership a "greenwashing" of BP and "prostitution" of the university. A spokesperson for Berkeley noted, however, that "they're going to be conducting biofuels research, so I can't imagine that there's anything we would object to."[46] The state of California also promised $40 million to help fund the initiative.

[45] The report and book were key sources for the current case study. Busch, Lawrence, Richard Allison, Craig Harris, Alan Rudy, Bradley T. Shaw, Toby Ten Eyck, Dawn Coppin, Jason Konefal, Christopher Oliver, & James Fairweather. *External Review of the Collaborative Research Agreement between Novartis Agricultural Discovery Institute, Inc., and The Regents of the University of California.* July 13, 2004.
Rudy, Alan Pl, Dawn Coppin, Jason Konefal, Bradley T. Shaw, Toby Ten Eyck, Craig Harris, and Lawrence Busch. 2007. *Universities in the Age of Corporate Science: The UC Berkeley-Novartis Controversy.* Philadelphia: Temple University Press.

[46] Carroll, Bobby. "Critics Say Deal Gives BP Too Much Power." *The Daily Californian* (November 26, 2007).

Appendix A
Chronology of Events

1997	PMB faculty members Wilheim Gruissem and Bob Buchanan, CNR Dean Gordon Rausser, and Cooperative Extension Specialist Peggy Lemaux begin meeting to discuss ways to bring funding into PMB. Rausser suggests using a bidding process.
December 1997-January 1998	PMB mails introductory letters to sixteen companies indicating that PMB was seeking industry funding. Four companies express interest.
February – April 1998	PMB faculty meet with each of the possible candidates for partnership.
April 30, 1998	PMB receives three formal proposals.
May 1998	PMB chooses Novartis Agricultural Discovery Institute for the research partnership.
June 1, 1998	First draft of the agreement with Novartis is completed.
August 1998	Rausser contacts the UNC-Berkeley Academic Senate regarding the pending agreement.
October 2, 1998	Rausser holds an open "town hall" meeting to present details of the near-complete agreement.
November 18, 1998	The Academic Senate states that it does not fully endorse the agreement and desires an ongoing assessment of the impact of the agreement.
November 22, 1998	At the Academic Senate's request, PMB appoints the Center for Studies in Higher Education at the University of Michigan to direct an external assessment of the partnership.
November 23, 1998	The Berkeley-NADI agreement is formally signed.
January 1999	NADI pays the first installment of funds.
May 15, 2000	The California state legislature holds a hearing to review the Berkeley-NADI relationship.
November 2000	Novartis spins off its agribusiness division to create Syngenta.
January 2001	NADI is renamed the Torrey Mesa Research Institute.
November 23, 2003	The Berkeley-NADI agreement expires.

Appendix B
Berkeley Department of Plant and Microbial Biology, Home Page
(July, 2009)

DEPARTMENT OF
Plant & Microbial Biology
COLLEGE OF NATURAL RESOURCES
UNIVERSITY OF CALIFORNIA, BERKELEY

News | Reach Us | Site Map | Search site | People Finder

ePMB

Research | Faculty | Department | Admissions | Undergraduate Programs | Graduate Programs | Seminars | Groups | Alumni and Friends

Department
- Services
- Faculty
- Staff phones & addresses
- Maps & Directions
- Facilities & Resources
- Faces of PMB
  - Faculty
  - Specialists
  - Postdocs
  - Graduate students
  - Staff
- Positions

Make a Gift to CNR

Department Overview

The University of California Berkeley College of Natural Resources contains four departments, including the Department of Plant and Microbial Biology. This Department contains two Divisions, with Brian Staskawicz as Department Chair heading the Plant Biology Division, and Tom Bruns as Associate Chair heading the Microbial Biology Division.

The Division of Plant Biology

The Plant Biology program focuses on contemporary basic plant research and design of biotechnologies. New discoveries have broadened our understanding of plant development and function, and provided tools for engineering plants that produce novel compounds and new crops with enhanced resistance to pathogens and insects.

With an increasing awareness of environmental problems, global changes, and emerging food needs, plants have emerged as a focal point for new research initiatives and educational training programs. The challenges of understanding the biology of plants, their development and responses to the environment, and human impacts on the biosphere will continue to fuel the expansion of plant research well into the future.

Faculty in the Division of Plant Biology responded to these challenges by developing an internationally recognized plant research and training program. As the key research and training program of the Agricultural Experiment Station in the California Division of Agriculture and Natural Resources, this Division operates at a strategic location near California's major agricultural production centers and within the San Francisco Bay Area, a hub for innovative biotechnology. Its close interaction with other biological sciences departments on campus and the Division of Microbial Biology, together with state-of-the-art facilities, have established a creative, stimulating, and productive environment conducive to important discoveries.

Plant Biology's partnership with the United States Department of Agriculture's Plant Gene Expression Center offers a model for successful collaborations between the University and the USDA.

Biotechnology Outreach Program

The Department, as part of the California Cooperative Extension Service, provides unique public education that has won praise from its many constituencies. P. G. Lemaux serves as the Department's Cooperative Extension Specialist in Biotechnology

Thus, the Division of Plant Biology at UC Berkeley offers many undergraduate, graduate, and post-doctoral training opportunities in areas ranging from basic to applied research and in novel multidisciplinary programs for increasingly diversified career opportunities.

Please see the listing of Plant Biology Faculty

The Division of Microbial Biology

The Department established the Division of Microbial Biology to provide a timely academic focus on microbial biology at UC Berkeley. A high quality of life for human and plant populations requires microbes and microbial activities. Moreover, we must understand the microbial world to comprehend the global ecosystem, evolutionary history, and diversity of life on earth. The twenty-first century brings a new understanding of the workings of the global ecosystem and a wealth of new technologies derived from the microbial world.

Faculty in the Division pursue a variety of fundamental and applied research in the areas of microbial physiology and biochemistry, microbial development and genetics, microbial ecology and evolution, and host-microbe interactions.

Please see the listing of Microbial Biology Faculty

The CAMPAIGN for BERKELEY

Donate to PMB funds

Webmaster

Appendix C
Berkeley College of Natural Resources, Home Page/Mission
(July, 2009)

COLLEGE OF
Natural Resources
UNIVERSITY OF CALIFORNIA, BERKELEY

Mission and History

Mission

The College of Natural Resources serves society by generating and disseminating knowledge in the biological, physical, and social sciences in order to provide the tools to both protect the Earth's natural resources and ensure economic and ecological sustainability for future generations.

History

The College of Natural Resources dates back to **1868**, when the California legislature established the university and made the creation of the College of Agriculture the first duty of the Board of Regents.

Also in **1868**, the federal Morrill Act established a national system of research stations to foster teaching and research related to agriculture. The University of California, Berkeley, became the first state-run Agricultural Experiment Station and the first land-grant college in California. To this day the Cooperative Extension functions of the Berkeley campus reside in the College and the dean holds a joint title as Associate Director of the Agricultural Experiment Station.

In **1914**, the College of Agriculture established a forestry program that included the study of forests and wildlands, along with their many resources, services, and recreational opportunities. In **1946**, this program became the School of Forestry.

As natural resource and environmental issues expanded beyond traditional farming and forestry, the College's mission also expanded. In **1974**, the former agricultural and forestry schools joined to form the College of Natural Resources.

Today, the College of Natural Resources is made up of the departments of

- Agricultural and Resource Economics (ag_res_eco.php)
- Environmental Science, Policy, and Management (env_sci_poly_man.php)
- Plant and Microbial Biology (plant_micro_bio.php)
- Nutritional Sciences and Toxicology (nutri_sci_tox.php) .

The intersection of these disciplines makes the College well-positioned to meet societal demands for environmental quality, sustainability of natural resources, food safety, nutrition, and economic development.

Professor Inez Fung is one of many prominent faculty members at CNR

Appendix D
Provisions of the UC-Berkeley/NADI agreement

Major provisions of the Berkeley-Novartis agreement:[1]

Funding

1. NADI would provide $25 million, two-thirds of which would go to PMB and one-third of which would be used to cover indirect costs.
2. NADI would expect to receive a federal, state, and local tax credit for the research conducted at UCB.
3. No funds or research materials from other for-profit organizations would be used under the agreement.

Research Committee

1. A Research Committee would be established with three members from PMB and two from NADI to review and approve research proposals from faculty on an annual basis.
2. The Research Committee would base awards on the quality and intellectual merit of research, the potential advancement of discovery, and the productivity of the PI. Proposals would be ranked in three categories: $100,000-200,000/yr, $50-100,000/yr, and $0-50,000/yr.
3. Research projects would be selected by PMB faculty members in their areas of interest. The Research Committee would not make recommendations to PMB faculty as to the scope and long-term goals of their proposed research projects.
4. Proposals would consist of one page on objectives, one-half page on key results, and one page on experimental outline, followed by citations and curriculum vitae. Awards would be made for three years, subject to annual review.
5. Research Committee members would be barred from taking part in discussions of their own proposals.
6. The Research Committee would encourage disclosure of inventions within the scope of the agreement. NADI, in turn, would have the right to review and make suggestions on drafting of patents. Responsibility for filing would remain with the University, but NADI would pay for filing. If foreign patents were desired by NADI, it would both file and pay for those.

The Advisory Committee

1. An Advisory Committee would be established with six members: the Vice Chancellor for Research, the Dean of CNR, one UCB faculty member without ties to PMB or CNR, the president of NADI, and two representatives from Novartis. The Advisory Committee would be responsible for managing the relationship. It would meet annually and would have no control over the selection of projects by the Research Committee.

Intellectual Property

1. The university would own all research results but would not to publish, copyright, disclose, or disseminate any results that included NADI proprietary materials or information without consent of NADI.
2. All proposed publications would be submitted to NADI 30 days prior to submission for publication to determine if they should be treated as a research invention.
3. If it was so designated, then it would be withheld from publication for 90 days or until a patent application is filed.

[1] Source: Busch, Lawrence, Richard Allison, Craig Harris, Alan Rudy, Bradley T. Shaw, Toby Ten Eyck, Dawn Coppin, Jason Konefal, Christopher Oliver, with James Fairweather. 2004. *External Review of the Collaborative Research Agreeement between Novartis Agricultural Discovery Institute, Inc. and The Regents of the University of California.* East Lansing, MI: Institute for Food and Agricultural Standards, Michigan State University.

4. Inventions emerging from use of NADI's data would be provided to NADI with an irrevocable, royalty free license.
5. NADI would have the first right to negotiate a non-exclusive royalty bearing license agreement. NADI would be able to sublicense to its affiliates.
6. NADI could terminate its licenses at its discretion.
7. NADI could exercise its rights to an "allowed percentage" of all subject inventions.

Additional Provisions

1. NADI would establish a facility near the university that would provide workspace for PMB faculty.
2. Wilhelm Gruissem would initially be the Principal Investigator. However, provision was made for his replacement by election of faculty in the event of his departure.
3. Supplies and equipment purchased would become the property of the university.
4. Termination would be permitted with one year's written notice.
5. Disputes would be settled by arbitration through the American Arbitration Association.
6. NADI employees who received university appointments would be subjected to university institutional property rights (IPR) policies.
7. Faculty who had relations with the Novartis corporation would be required to disclose any financial interest they had. If they did have a financial interest, then the Berkeley Conflict of Interest Oversight Committee would review the case and advise the Vice Chancellor for Research.
8. UC-Berkeley would provide NADI with an annual research report 60 days after the end of each year. A meeting of all supported investigators was to follow soon after, at which research results would be discussed. The cost of the meeting would be paid separately from the $25 million grant.

The Agreement was amended three times. The first amendment, in 2000, reduced the funds slightly to permit transfer of funds to the nearby USDA Plant Gene Expression Center in Albany. A separate Cooperative Research and Development Agreement was signed with USDA.

The second amendment, also in 2000, changed the rules governing the use of Affymetrix-Produced Expression Probe Arrays, a type of proprietary equipment used in PMB labs. This amendment permitted PMB faculty to take advantage of an initial agreement with Affymetrix rather than being bound by an existing agreement between Affymetrix and Novartis.

The third amendment, in 2002, changed the name of NADI to Torrey Mesa Research Institute and clarified some technical points with respect to materials transfer.

Appendix E
Students for Responsible Research Statement on Berkeley-Novartis Partnership and Petition Request
(May 1999)

Please sign and mail to:

Students for Responsible Research
c/o Jesse Reynolds
University of California
Division of Ecosystem Sciences
151 Hilgard Hall #3110
Berkeley, CA 94720-3110

We must receive signatures by May 4!

We are a group of students, primarily graduate students in the College of Natural Resources (CNR) at the University of California, Berkeley, who are concerned about the impact of large-scale funding by for-profit corporations on university research. Specifically, we are worried about the influence of a recent alliance between CNR and the Swiss biotech giant Novartis, who have forged a **$25 million alliance that puts the College's academic integrity at stake**. This agreement was signed despite the fact that it has weak oversight, that the alliance was hurried through while student and faculty concerns were ignored, that this contract amounts to tax dollars being used for the research & development of a foreign corporation, and that the alliance moves the College's research agenda towards developing profitable genetically engineered crops at the expense of its mission: to meet societal demands for environmental quality, sustainability of natural resources, food safety, nutrition, and economic development through public good research and the extension of the results to the people of the state.

The details of the contract became available only after its signing. It revealed that Novartis gets access to the results and first rights to exclusively license - and profit - from not only the research they fund, but nearly all the research in the entire Plant and Microbial Biology Department - including government funded research. Yet many details of the alliance remain unclear. For example, the contract does not clarify if the alliance includes the appointment of adjunct faculty from Novartis, whether the University will be held liable for the products developed from the research, or if the alliance is with a select group of faculty, the Department, or the entire College.

If you are in the College of Natural Resources, **you should be concerned** about the damage to the reputation of the College. If you are in the University of California, you should be concerned that this deal indicates the future of funding in the entire UC system. If you are involved in academic research, you should be concerned that this sets a dangerous precedent for the future of public universities. And if you pay taxes, you should be concerned that your money is being used, not for the public good, but to give exclusive, profitable product licenses to a Swiss biotechnology giant.

More information is available at http://www.cnr.berkeley.edu/~reynolds/srr .

Petition to Amend the Novartis - UC Berkeley Contract

Drafted by Students for Responsible Research, UC Berkeley

Whereas, the contract initiating the Novartis – UC Berkeley alliance has become public;

and whereas the majority of students, faculty, and concerned citizens were unable to participate in the formation of this contract before its signing;

and whereas the alliance will have significant impacts on the Department of Plant & Microbial Biology, the College of Natural Resources, UC Berkeley, the public interest, and future agreements between public universities and private corporations;

and whereas a recent formal survey of faculty members of the College of Natural Resources demonstrated serious division within the College over this agreement and doubts about the wisdom of entering into such a contract with the provisions as written;

We, students, faculty, staff, and concerned community members, call upon the Chancellor of the University of California – Berkeley to amend the contract between NADI (Novartis Agricultural Discovery Institute, Inc.) and the Regents of the University of California in the following manner:

- Specify that the contract exists between NADI and a group of faculty in Plant & Microbial Biology, removing any involvement of the College of Natural Resources' faculty or dean. Furthermore, either the Dean of CNR or the Chancellor of UC Berkeley should clarify this relationship to the UC Berkeley community, the media and the public.

- Specify that the contract does not reserve any number of adjunct faculty positions for Novartis employees. UCB faculty members may propose adjunct status for a Novartis employee, but he/she must be judged solely on academic and professional merits. The mention of available adjunct faculty positions in a contract, or in associated materials and discussions, creates an expectation that could bias objective evaluation of proposed appointments.

- Specify that Novartis/NADI shall have reserved first rights of negotiation only on patents developed through research that NADI has directly funded, not as the contract currently delineates (NADI has the option to first negotiation on a percentage of all patents developed by participating faculty of PMB. This provision enables NADI to "cherry pick" the most valuable patents. Current exclusions include only for-profit agencies). If this step is not taken, contract administrators should notify all sources of public and private funding to the Plant and Microbial Biology Department of the terms of the Novartis contract in order that they may designate their research off-limits to NADI's first right of negotiation, as provided for in the current contract.

- Specify that patents licensed to NADI/Novartis through the contract will transfer 100% of product liability – protecting UC Berkeley from litigation resulting from technologies produced and/or marketed by NADI/Novartis.

- Specify that parties involved in the negotiation of or participation in the contract disclose any conflicts of interest to the University community and to the public, as suggested by the California Fair Political Practices Commission.