

MARSHALLING FORCES

IN A COMPETITIVE RESEARCH ENVIRONMENT—

SOME SLIPPERY ISSUES

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Not being a research administrator myself, I often wonder what drives administrators. What do they think about and what do they worry about? What gives them a sense of satisfaction? The world I understand is that of the ordinary faculty member, because that is what I am. I am a plant pathologist and fungal geneticist and I spend most of my time studying how fungi cause diseases on plants. The force that drives me is a love of genetics and my main worry is finding the time to write the papers and grant proposals that I know I will need to advance my career. I get my satisfaction from successes in the laboratory, and occasionally, the classroom.

Despite the fact that my heart is in the laboratory, increasingly, my time is not. For better or worse, I continue to be asked to perform service for the greater good of the university. I am not complaining, but I am still trying to understand how to do it well and I wonder whether it is something from which I will eventually derive satisfaction.

This last year, I was asked to establish a cross-university linkage between Iowa State University and the University of Illinois. This is my first such attempt and it is still in its infancy, so my understanding of the process is probably naïve. However, since I am still a faculty member "in the trenches," I hope my comments will help the administrators in the audience understand the perspectives of researchers called upon to perform administrative tasks. The better administrators understand their faculty, the easier it will be for administrators to achieve their goals.

An Attempt to Create a Cross-University Linkage

The linkage I will be telling you about is for genomics research on soybeans. The effort began last fall when I was asked by the associate deans of the colleges of agriculture at Iowa State University and the University of Illinois to help create a cross-university linkage in soybean germplasm improvement.

A significant driving force behind the linkage has been the concerns of the soybean promotion boards in Iowa and Illinois. These boards are major sources of funds for soybean research in the Midwest. Iowa State University,

for example, gets approximately 2.5 million dollars annually from the Iowa Soybean Promotion Board. The boards are thus very interested in having their universities do the best possible research. Over the years, they have expressed a number of concerns about the way that universities do research. These concerns have driven their interest in encouraging cross-university linkages. For example:

"We need big picture, bottom-line results."

The promotion boards exist to serve the growers. In order for check-off funding to continue, the boards need to be able to show high impact results. This is often easier to get from multi-investigator projects than from individual investigator projects. The team approach can produce bigger impacts.

"We put a lot of money into our universities; we want to see our dollars leveraged as much as possible."

The boards know that well organized teams of researchers, especially teams representing more than one state, can compete better for federal funds than can individual investigators.

"University research seems uncoordinated and duplicative."

The boards know that university researchers are free to do essentially whatever kind of research they want. There is no overall university research plan. It is every researcher for himself or herself. They also know that researchers at different universities often don't talk to each other. This is obvious whenever the boards meet to compare their research activities. Why should the Iowa board pay for the same research to be done in Iowa as is currently being paid for by the Illinois board to be done in Illinois? They want the researchers at various universities to work together in an organized manner.

"We want new traits and new technologies in the public sector, where they are freely available and not controlled by the big seed companies."

The boards are concerned by the way that big industry is starting to dominate agricultural research. They are looking to universities to produce new, desirable soybean traits that will remain in the public sector, where they will benefit growers and the public, not just a company's profit margin. Conducting plant biotechnology research independently of companies is, as many of you know, not as easy as it once was. Companies such as Pioneer, Monsanto and Novartis have very large, well-funded plant biotechnology research programs. Pioneer and a number of other seed companies have

excellent plant breeding programs. The result is that it is difficult for academic researchers to compete with, or sometimes even to keep up with, industry. One way to increase our competitiveness with industry is to form alliances with other universities. Another solution is to find research niches companies do not occupy, presumably because they do not see them as profitable in the near-term.

Because of concerns such as these, the Iowa and Illinois boards are supporting efforts by Iowa State University (ISU) and the University of Illinois (UI) to establish cross-university linkages in research relevant to soybean production and utilization. The first step was the signing of a Memorandum of Understanding between ISU and UI in May 1998 that states that the two institutions agree to work together in research and development initiatives related to soybeans. Last fall, the associate deans of the colleges of agriculture of two institutions brought together research representatives from ISU and UI (five from each institution) who had interests in soybeans. I represented soybean biotechnology. At the meeting, we discussed research areas that might be appropriate for cross-university linkages. We looked for areas in which there was (1) research strength at both institutions, and (2) potential for future funding by various agencies.

One of the areas chosen for further discussion was soybean genomics and germplasm improvement. I and my counterpart in Illinois were asked to take responsibility for exploring this area further. Our first step was to write small grant proposals to our respective boards to get funds to bring together all researchers at both universities involved in soybean genetics, biotechnology or germplasm improvement. The result is the Iowa-Illinois Joint Research Planning Session: *“Genomes to Germplasm: Optimizing the Application of Biotechnology to Soybean Germplasm Improvement.”*

The purpose of the meeting is to produce a list of common research goals and a plan for achieving them in an efficient, coordinated manner. Most importantly, it is to develop a series of proposals to be submitted to the Iowa and Illinois boards, multi-state soybean boards, and/or federal agencies. When these proposals are funded, the joint research will begin. Because, at the time of this writing, we haven't met yet, I do not know how well the meeting will work in establishing linkages. However, I will tell you how we hope it will work and some of the lessons I am already learning about establishing and maintaining cross-university linkages.

The Iowa-Illinois Joint Research Planning Session

Invited Participants

Since our goal is to establish linkages in the area of soybean germplasm improvement, we have invited all researchers at ISU and UI

involved in the genetics, molecular biology, transformation and breeding of soybeans. There are 16 faculty in this area at ISU and ten at UI. We have also invited a soybean utilization expert from each university to help us decide what traits should be incorporated into soybeans, and an administrative representative from each university, specifically the associate deans of the colleges of agriculture. We have also invited the Iowa Soybean Promotion Board and the Illinois Soybean Checkoff Board to send representatives as they see fit.

Tentative Meeting Schedule

To achieve the goals of the meeting, we have organized it into five sessions spread over one and a half days. They are as follows:

Session 1: *Priorities in Soybean Improvement*

Assuming that technology is not limiting, what traits should be engineered into soybeans? Who would benefit and why? Would any progress we make on these traits be negated by efforts already underway in industry? That is, what aspects of soybean germplasm improvement should be given a high-priority by the public sector? To help us with this session, each participant will be given a booklet beforehand on "Economic Implications of Modified Soybean Traits" published by the Iowa Agriculture and Home Economics Experiment Station. We will also have meetings beforehand on our respective campuses with crop utilization experts.

Session 2: *Joint ISU/UI Research Capacity*

What are the strengths and weaknesses of each institution in soybean genetics, molecular biology, transformation and breeding? In what areas do the research capacities of ISU and UI complement? To assure that this session goes smoothly, the researchers from each institution will discuss and catalog this information for their institution before the joint meeting.

Session 3: *Prioritization of Research Efforts-I*

What kinds of soybean germplasm improvement can we achieve in the priority areas given the current research capacities and funding resources of the institutions? How can we achieve those priorities most efficiently?

Session 4: *Prioritization of Research Efforts - II*

Which additional priorities outlined in Session I can be realistically achieved if additional resources or expertise were available? How long will it take to achieve these priorities and what additional resources or expertise would be needed? Which agencies would likely fund this work?

Session 5: Implementation

In this last session, we will make final decisions on our research priorities and assign responsibilities for writing grant proposals.

Thus, what we hope to get out of the meeting is one or more proposals for multiple-investigator, cross-university projects in which the research efforts are coordinated, synergistic, free from duplication, and in niches not already filled by industry. We are also hoping that this meeting will engender a shared sense of purpose among the participants, as well as a plan for continuing communication.

Slippery Issues in Establishing and Maintaining Cross-University Linkages

Since I have just started my efforts to create a cross-university linkage, I am drawing on my experience with other linkages to predict problems that might arise. I am also drawing on conversations with other faculty members who have established cross-university linkages in the past. As far as faculty members are concerned, the overall problem with cross-university linkages seems to be **"more hassle for less credit."**

Establishing and Maintaining Communications

Distance creates barriers to communication and slows the research effort. The group will need ways to break down the barriers. E-mail and phones are helpful for routine information transfer, but to initiate and maintain a relationship requires trust and that requires face-to-face contact. At a minimum, there should be an initial organizational meeting of the researchers. This should last at least a day, preferably longer, so that the researchers start to understand and feel comfortable with each other. Once the linkages are established, there should be yearly Project Meetings. Again, these should be face-to-face and last at least a day. Short meetings are helpful additions—over lunch or at a breakfast in association with a regular scientific conference.

Dealing with Egos

Although it is tempting to avoid "difficult" people by not inviting them to participate in a linkage, everyone conducting relevant research should be invited. There are probably a variety of ethical reasons for this strategy, but a pragmatic reason is that the commodity boards have no patience for internal academic squabbling. It is best to invite every researcher who is even remotely relevant to the proposed project. Those who can't get along with the group, or find they can't contribute, will eventually drop out of their own accord.

Another problem is that not everyone who participates in the effort to create the linkage may get funding, or, if they *do* get funding, they may not get the authority or credit they feel they deserve. In a large, multi-investigator project, there can be only one leader, only one first author, only one first principal investigator, and only one spokesperson. Participants must be reminded of these facts at the outset to reduce the possibility of hard feelings.

Finding Money and Time

Establishing and maintaining a cross-university linkage takes time and money. It will be necessary to include in budget proposals sufficient funds for yearly meetings. In addition, someone has to handle all the arrangements for the yearly meetings and, if the research funds are coming to a single "coordinator," he or she will need to administer any needed subcontracts.

Allocating Credit

If the research is truly multi-investigator, so are the publications. The problem is that multi-author papers are actually harder to write than single author papers, yet less credit is given per individual for the multi-author papers. This is especially true when the number of authors is large. How do you give adequate credit to everyone in publications and at promotion, tenure and raise time?

A case in point is a publication of a friend of mine. He is the 18th author out of nineteen on a publication derived from a multi-university research project. This is despite the fact that the project was his idea and he wrote the grant to do the research, disbursed the funds to the other researchers, arranged the project meetings, and organized the effort to write the paper. He informed me that it took the group two hours just to decide the order of the authors on the paper and some were *still* unhappy. Would a review committee or administrator seeing this paper be able to recognize the extent of his contributions?

This brings up the related problem of how to give credit to the leader for all the time he or she spends organizing the group. How is this type of activity adequately described in a promotion document or yearly activity report so that it is appropriately "counted" by those deciding promotion, tenure and pay raises?

Finding Incentives for Participation

There is little doubt that cross-university linkages are good for science. This fact will be incentive enough for some faculty members to stay involved, despite the hassles. And, if things work well, most of the participating faculty

should end up with extra dollars in their programs. Yet many faculty members may not believe the extra dollars are worth the extra annoyance. After all, why endure the frustrations of a group project when you can get more money and more credit for less hassle by writing a grant by yourself?

Faculty members have learned that the academic system rewards selfishness. Verbal expressions of appreciation from administrators do not carry nearly as much weight with faculty as promotions, pay raises, or other tangible perks. Why should faculty members get involved in a project that gives them more headaches for less reward?

How Administrators Can Promote Cross-University Linkages

The most important thing that administrators can do to promote cross-university linkages is to get their faculty to "buy in." Cross-university linkages cannot be established (at least, not successfully) by a dictum from above. To get faculty members to "buy in," administrators must recognize and acknowledge that large multi-investigator, multi-institutional projects are more work and often do not benefit individual researchers as much as single investigator projects. To encourage cross-university linkages, the reward system for faculty researchers needs to be adjusted to tangibly reward participants and not penalize them.

To reduce the penalty, administrators could provide clerical assistance to arrange meetings and/or handle budgets, as appropriate, so that the researchers and their technical staff are not saddled with these tasks. One possibility might be a pool of part-time secretarial help paid at the college level. Such assistance could be made available to multi-institutional projects on an "as needed" basis. Another suggestion is to make sure that all faculty members know how to properly indicate their contributions to research papers in their promotion and tenure documents. It is probably a good idea to do this also in annual faculty activity reports, since these can have big impacts on annual raises.

The most important thing that needs to be done, however, is for administrators to find a way to give tangible rewards to the individuals who take on leadership responsibilities for cross-university linkages. At present, many faculty members view any expression of thanks for their organizational work as lip service that has no impact on their salary or promotions. They see publications as the only avenue for advancing their careers or improving their personal financial situations. Some of the individuals with whom I talked were quite bitter about this. It is little wonder that so many faculty members view selfishness as the key to success in academia.

Fortunately, there is hope. I have seen several rewards for special service that faculty members seem to appreciate. The first is to give the

individual half a research assistantship for each year of their activity in the special leadership role. This has been done at Iowa State University for faculty members who accept the chairmanships of certain large interdepartmental graduate programs. It has been extraordinarily successful in encouraging faculty to volunteer to serve. An alternative is an "administrative increment," that is, a temporary increase in salary.

Neither of these rewards is particularly appropriate for the situation I have described, where the service, though above the ordinary, is not as extensive. In this instance, a less substantial reward might be in order, for example, a small increase in the person's base salary. The amount could vary depending on the extent of their activities. However, it need not be large. An extra raise of as little as \$500 can make a big difference in how the person feels; it is tangible evidence that one does not have to be selfish to advance one's career. The raise should come with a note or a verbal explanation that it is in appreciation of their special service on the behalf of the institution.

In summary, for research administrators to succeed in establishing productive cross-university linkages, they need to go back a few years and remember life as an ordinary faculty member. They need to think about what motivated *them* to take time away from their research programs to help others. While it may never be necessary for researchers like myself to fully understand what motivates research administrators, it is essential that research administrators understand what motivates researchers.

My Favorite "Slippery Issue"

I have told you about my efforts to create a cross-university linkage and some of the "slippery issues" with which I have dealt or anticipate dealing. I have also given you my perspective on how administrators can help. However, cross-university linkages are not the only slippery issues with which I have dealt recently. My research focuses on slippery fungal slimes. This is a topic I love to discuss. However, I will restrain myself and save my "slime" seminar for another, more appropriate conference.