

Science Foundation (NSF Early CAREER and Arabidopsis 2010), as well as from the USDA Specialty Crop Research Initiative.

In parallel with my Arabidopsis-*Pseudomonas* focus, my research interests have grown to include investigations into the field of oomycete-plant interactions. This was, at first, an intimidating venture into the unknown. Through conversation with faculty here at MSU (Dr. Mary Hausbeck, Dr. Ray Hammerschmidt and Dr. Robin Buell), as well as support from Dr. Sophien Kamoun, the "Day Lab" became heavily invested in the genomics and genetics of cucumber downy mildew, elicited by the obligate oomycete pathogen *Pseudoperonospora cubensis*. At present, we have secured a USDA grant, as well as industry funding, to establish a foundation in this area. We have published 2 manuscripts (*Mol. Plant Pathol.* and *MPMI*), and have 3 more under review (2 at *PLoS One*, and 1 at *PLoS Path.*). All in all, this has been a sound investment, and more importantly, has broadened my group's interactions with some of the World's leaders in the field of oomycete biology, while growing my curiosity in plant-pathogen interactions. Over the next 5-10 years, I see my research program developing more avenues of research similar to the work we are pursuing with downy mildew of cucumber.

Beginning in January 2012, my laboratory will move to the new, state-of-the-art Plant Science Building, sharing a 15,000 square foot lab space with Dr. Gregg Howe and Dr. Sheng Yang He. Across the plant sciences at MSU (>150 faculty), 12 research groups were selected. This is a unique opportunity, not only in providing me with two excellent mentors and potential collaborators, but for the students and postdocs in my research group, this will provide them with numerous learning and mentoring opportunities.

Grantsmanship

My lab is not poor, but we aren't what I would consider "rich". We write, we submit, we revise, resubmit, and more often than not (so far!), we're funded. We pick and choose carefully, not submitting a proposal for funding until we are confident we have an exciting story to tell. That said, in the current climate, my general philosophy is to limit the number of (relevant) submission deadlines that pass without having one of my grants submitted. At the same time, however, I am very critical as to the quality of the proposal; I will not submit a proposal that I feel is not ready for funding. To this end, my first proposal was more than 6 months in the making. Before arriving at MSU, I began drafting the outline for my first submission. When I arrived at MSU, I began the experimentation necessary to generate the preliminary data, and when Miaoying arrived, the experimentation was validated, and the preliminary data assembled. In the end, the proposal was funded by the National Science Foundation as a Young Investigator CAREER Award. There's nothing like getting your first grant funded; I will admit, I still jump when every proposal is funded. At present, I have had 3 NSF grants, a USDA grant, substantial funding from industry, and a significant amount of funding through internal mechanisms at MSU.

As part of several of my funded proposal, collaborative efforts have enabled me to be a part of larger (\$\$\$) grants, thus enabling a broader scope in our investigation of various problems related to disease resistance in plants. For example, together with Chris Staiger (Purdue) and Jeff Chang (Oregon State), a NSF-funded Arabidopsis 2010 grant is allowing us to investigate the role of actin in defense signaling. Similarly, as co-PI on a grant with Dr. Yiqun Weng (USDA-ARS, Madison, WI), I am simultaneously investigating the genetic determinants of downy mildew resistance in cucumber. Both of these opportunities have impressed upon me the necessity of collaboration in science, and more importantly, the pace at which good science.....important science.....moves.

Mentoring

This area is an on-going challenge for me, not because I don't enjoy it, but because I want to do the best I can. Mentoring, as I have learned over the past 5+ years, is more than serving as a training mechanism for postdocs and students. Mentoring is an all-inclusive commitment to the personal and professional development of the individuals I ask to work in my lab. As I began building my research group, integrating personalities was one of the toughest tasks I encountered, and at present, still presents a minor hurdle now-and-again. Decisions related to work ethic (i.e., motivation), career stage and the ability to work well with others are factors that weigh heavily in my decision to hire someone. Looking back over the previous 5 years, I feel I have been successful in this arena.

Beyond my direct interactions with postdocs and students, I have also developed a personal philosophy as to how these two groups of individuals should interact (in a perfect world!). My current philosophy is to have a 1:1 ratio of postdocs to students; however, as I write this, I look into the lab and see more students than postdocs. I have great students! Regardless, a balance of personnel facilitates several important social and professional networks within the lab. First, it provides postdocs with an opportunity to develop the mentoring skills they will need/use as they move into their own independent research positions. Over the course of my training and education, I have had the opportunity to work directly, one-on-one, with postdoctoral researchers. I found these interactions to be invaluable not only in my professional development, but also as bridges in building long-lasting friendships. Secondly, and most importantly, ratios of postdocs and students can significantly transform the lab environment. Too many postdocs can create a competitive atmosphere within the lab whereby students feel intimidated, less creative and may retreat to secondary roles within the lab's infrastructure. At the same time, students bring youth, inquisitiveness and a bit of chaos and spontaneity to a stressful environment. As I have watched my lab grow over the last 5 years, it has been transformed with laughter, (yes even) tears, shouting, high 5's and the occasional "look at this result....this is cool!". I am hopefully the next 20 years will echo with the same sounds!

Teaching

Mentoring and teaching go hand-in hand. Beyond my roles as an educator in the lab, I also assume duties as an instructor for a graduate-level course in plant-microbe interactions (Plant Pathology 881). To date, Dr. Hammerschmidt and I have co-taught this course 3 times (2007, 2009, 2011), and I found this experience to be both rewarding and challenging. On the one hand, this is an area that I feel very comfortable teaching---it *is* my area of expertise. On the other hand, making the information accessible to a broad audience sometimes proves challenging. Fortunately, I teach a course that I feel very comfortable teaching, both in terms of understanding the content, as well as communicating it to a broad audience. Overtime, I would like to further develop this into a course that is, for all intensive purposes, my own.

My general philosophy is, and always has been, that teaching is an engaging profession. The responsibility of the instructor is to interact with, excite and challenge the students. Over the next 5 years (2 course offerings), I would like to begin the transition towards developing this course into a class that is widely recognizable across multiple departments and programs, and moreover, has a consistent enrollment of 20 students per semester. This past spring, Dr. Hammerschmidt and I made a significant step in achieving the goal, with approximately 20 students from 6 different departments enrolled. As the administrative mechanisms at MSU are changing to accommodate increasing budget constraints, we too must recognize that in an ever-increasing competitive environment, instruction also competes for the attention and focus of the next generation.

Service: University, Discipline and Community

Community service is one area of my professional development that I find the most rewarding. At the University level, "service" has many definitions, yet none as important as recognizing the vision and role of the institution in the years to come. Just as I have 5, 10 and 20 year plans, so does MSU. In recognizing that I will likely be here for some time to come, it behooves me to help the administration find the vision and direction for the University, both locally, nationally, as well as internationally (see below). To this end, I have volunteered my time to serve on several University committees during my tenure here at MSU. In 2006, I had the privilege of working with Dr. Eunice Foster as part of the CANR's office of Diversity and Pluralism. This was hands-down the single-most rewarding experience of my time here at MSU. I had the opportunity to serve as an Ambassador and recruiter for MSU, visiting several Historically Black Colleges and Universities (HBCU) in Mississippi, speaking with students about their plans for the future, and telling them about MSU. In all of this, I was reminded of my role as (assistant) professor at a top-tier University---education, outreach and research.

The second instance of my service to MSU was part of the Plant Sciences Excellence Committee, which was charged with the task of designing the future of the plant sciences at MSU. Our plan was grand. In 2010, I was fortunate to witness the first of many significant steps that MSU will take in advancing the prowess of Plant Science research at MSU---the beginning of construction of the new Plant Science building, designed to accommodate state-of-the-art interdisciplinary research in the plant sciences. As an aside, I am fortunate to be moving into this building in January 2012, where I will share a 15,000 square foot lab space with Sheng Yang He and Gregg Howe.

"Be careful what you ask for!". As I donned the role of eager young assistant professor, taking every opportunity to assist and serve within my MSU community, I was presented with an opportunity to serve as my Department's representative on the MSU Plant Science Graduate Recruiting Committee, a unit borne out of the vision of the late Dr. Hans Kende, charged with bringing the best and brightest to Michigan State University. For 3 years, I observed, learned and participated in the tough task of identifying from more than 200 applicants the top 30 to invite to campus. From this, 5 were selected for fellowships. In 2010, after more than 10 years of service, Dr. Rebecca Grumet stepped down as chair, and recommended to the Dean of the Graduate School that I take her place. I am now in my second term as chair of the committee, and am enjoying it immensely. We have continued the success of this program, increasing our new plant science student population to more than 20 each year; this is in addition to the academic unit recruits, which themselves currently surpass 30.

Finally, service to the community and my discipline is equally important. I rarely pass on an opportunity to review manuscripts that I am qualified to review, nor do I miss an opportunity to participate in a review panel at the NSF; the latter is equally important as a learning opportunity for me! To this end, I have participated in close to 10 NSF panels (Integrative Organismal Systems, Major Research Instrumentation, East Asia Pacific Graduate Fellowship) in the 5 years since beginning my tenure at Assistant Professor. These have been regarding opportunities, not only in seeing how the process of peer review and funding works, but as noted above, I get to read some of the best proposals in the US! I learn communication skills, what it takes to assemble a grant, and more importantly, train myself as a visionary (of sorts!), gaining a "high altitude" perspective of science and research. For my discipline, I have successfully written a USDA proposal to support student and postdoc travel to the next MPMI meeting, to be held in 2012 in Kyoto, Japan. Pay it back, or pay it forward. I have been fortunate in receiving support from my colleagues and the mechanisms (i.e., grants) that support us. I wholeheartedly recognize that as part of the process, my duties often require me to participate in the peer review process, for it is the same process that determines my own success.

International Presence

I sometimes ask myself “what would I do if I could choose another profession?”---this question often rings through my mind sometime between 24 and 72 hours before a grant deadline! My answer is always swift: “*I want to work for the NSF in the Office of East Asia and Pacific Programs.*”. I want to travel. I want to talk about science with professors from Tokyo University, with farmers in Brazil and students in Africa. I had a plan, but no real desire to leave MSU. Then I remembered something my Ph.D. advisor, Dr. Gary Stacey, said to me in 2009. Now at the University of Missouri, Gary is involved in International Programs and Research at MU. I remember him regaling tales of his travels, from Cambodia and Vietnam, to Korea and China. He talked of dinners with the Provost and President, with senators and the like. After 10 minutes of this, he looked at me and said, “but Brad, you know, no matter where we go, what we (MU) promise and propose to each of these International research institutions, the first thing they say is, Michigan State was here 2 weeks ago!”. With that, I realized that MSU is a global institution.

As a Faculty member at MSU, I am responsible for maintaining an international presence through science, outreach and education. To this end, I have begun to actively pursue international opportunities as a means to not only broaden the scope of my research interactions, but to “test the waters” if I might contribute to the research of others. Thus far, I have visited China, Thailand and Kenya as part of education and outreach opportunities. In the case of the latter, I have maintained contact with many new colleagues in Africa, and together with Dr. Jeff Chang (Oregon State), will be preparing a short proposal for initiating research activities with BecA (Biosciences eastern and central Africa). Similarly, my connections in China have sustained the test of time and distance, and I continue to build and renew initial conversations, developing collaborative interactions with some of the world’s leaders in the field of genomics, genetics and vegetable research.

Summary

In short, my time here at MSU as an Assistant Professor has been rewarding. I’ve come to realize that I will never be able to give back as much as MSU gives to me. I doubt anyone can and ever will. That is what makes MSU great. I can say that I have met most, if not all, of my goals I put forth on Day 1. I am funded by the National Science Foundation (CAREER and Arabidopsis 2010), the USDA through a Specialty Crop Research Initiative grant, the Pickle Packers International Agriculture Research Fund, and MSU Project GREEN. My lab works hard, and we are having fun. I can honestly say at the end of all of this, “I am pleased with our successes, and looking forward to building upon these in the future!”.