

# EDITORIAL *Teamwork creates opportunities for high-impact research*



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Two journal articles published in 2007 caught my attention. Both were in the August 2007 issue of *Science*, which brings to the forefront changing trends in research and a historical perspective on how “high-impact” science is conducted.

The first, “The Cha Cha Cha Theory of Scientific Discovery” by Daniel Koshland, previously of the Department of Biochemistry, Molecular and Cell Biology at the University of California, Berkeley and past editor of *Science*, focuses on the three categories of scientific pursuits: charge, chance and challenge.

All three of these pursuits should be nurtured in the research environment, whether the research falls in the category of being directed to uncover how something works (charge), stems from a serendipitous finding that leads to something bigger (chance), or is focused on trying to explain something that remains a scientific mystery (challenge). Chance is probably the hardest to foster, as it usually happens by accident, but as Louis Pasteur said, “Chance favors the prepared mind.”

Creating a research environment that allows all of these pursuits to take place is the hallmark of a research institution and something the Division of Agriculture, Forestry and Veterinary Medicine at Mississippi State, I believe, cultivates among its faculty.

Currently I wear two hats: associate professor in the Department of Animal and Dairy Sciences and interim head of the Department of Biochemistry and Molecular Biology. From this unique perspective, I see team-centered, mentor-like momentum within DAFVM that creates opportunities to empower faculty in “Cha, Cha, Cha” scientific pursuits.

I see it in the internal granting programs that help generate the data needed for larger extramural submissions or to test often high-risk hypotheses, perhaps with no guarantee of a pay-off, that might not be funded through traditional mechanisms. I also see mentor programs for young faculty that help “demystify” aspects of the university environment that many don’t really understand. I see broad attempts to maximize resources through the consolidation of research resources and a trend toward team-oriented research initiatives. This is addressed by the second article, “The

Increasing Dominance of Teams in Production of Knowledge” by Wuchty, Jones and Uzzi.

This article, recently circulated by Life Sciences and Biotechnology Institute Director Shane Burgess to some MSU research faculty, highlights the trend toward more frequent citations and impact from research conducted by teams rather than individuals. Collaborative, team-oriented research maximizes resources, broadens the scope of research that can be conducted, and takes advantage of the interdisciplinary nature of teams.

We support and encourage faculty involvement in multi-state regional research projects whose primary mission is to facilitate projects of larger scope and broader application than single-institution or single-investigator research.

I was asked recently why publications in some areas of the agricultural life sciences often have many authors instead of one or two investigators. I cited the above-referenced manuscript and indicated that in today’s research environment, it is increasingly difficult to have the high level of expertise with all the tools needed to achieve one’s research agenda, and it is often too costly to shoulder alone.

I have often known about and occasionally instigated discussions that pit “old” approaches against “new” technologies—applied vs. basic research, traditional weights and measures vs. genomics-proteomics-metabolomics technologies, and so on. It is apparent to me that programs that can blend the traditional with the state of the art and use the right tools for the right reasons have the most impact.

At a recent Southern Association of Agricultural Scientists (SAAS) meeting, several researchers were debating the merits of various state-of-the-art technologies in solving a particular problem associated with livestock growth. They were trying to clarify the appropriate endpoint for their seemingly complex study when a more seasoned investigator said, “Why don’t you weigh them?” The simplicity of his approach left the group in stunned silence. His solution was correct in defining the end result, and everyone knew it. While the “simple” tool (in this case, a scale) may tell you what happens, it may not tell you why or be able to take you to that next level of understanding and discovery. Often more complex tools are needed to “Cha, Cha, Cha.” We, however, must not forget that agricultural research, in the end, is about translation—something the seasoned investigator understood well.

All research can have some degree of impact, sometimes immediate and sometimes not until years later as a piece of a larger puzzle. However, a program that uses the right tools for the job and then translates findings to the layperson is a commodity in and of itself.

In agriculture, much like the achievements in the biomedical sciences, the broader impacts of commodity-oriented research by nature have the potential for great impact. Research that improves productivity or production efficiency or leads to new commodity development can change the world we live in.

Now, that is high-impact science and takes teamwork to accomplish.