

**MEMORANDUM****DATE:** August 23, 2017**TO:** All Colleagues, College of Agriculture and Life Sciences**FROM:** Parker Antin   
Associate Dean for Research**RE:** Progress Towards Increasing CALS Research Productivity and Impact

Increasing research productivity is an important CALS strategic goal that is also aligned with the University's Never Settle plan. Most often, research productivity is measured by grant and contract dollars awarded and spent. Many have argued that this is problematic because dollars are not a measure of research impact. In fact a recent publication<sup>1</sup> likened the touting of research awards and expenditures to an airline proclaiming that "we use more gasoline than any other airline", or that "we spend more per year transporting our passengers!"

Beyond the obvious limitations of measuring the "fuel" rather than the products of research, directly comparing research dollars across diverse units, colleges and institutions is also problematic because research costs vary dramatically between fields in ways that have nothing to do with quality. For example, biomedical research grants are typically larger than grants supporting environmental sciences or production agriculture. It would be challenging to suggest that cardiovascular research is intrinsically more important than ecosystems modeling or increasing our food supply. For this reason disciplines are treated equitably and not equally as part of my job to report our research progress to the dean, the unit heads and central administration.

Nevertheless, as a seminal part of the UA research enterprise, CALS and its individual units are evaluated by their ability to grow programs. Additional resources do flow to those who meet assigned growth targets. Dollars are one measure of success partly because universities and federal agencies have evolved systems to precisely track them. Measuring impact on the other hand is hard, with true impact sometimes becoming apparent only years after a research project has ended. Publications and citations generally reflect the importance of research within a scientific community, though these metrics also vary considerably between fields. Patents, patent licenses to companies and startups can be highly impactful, but tend to evolve years after a research discovery is made. Measures of impact are therefore diverse and more challenging to comprehensively track than research funding.

Fortunately, growth generally correlates with increased impact because more funds support larger research programs with more research output. Because grants from different agencies and fields return differing percentages of Indirect Cost Return (ICR) in ways that have nothing to do with impact or mission delivery, CALS and the UA use the Modified Total Direct Costs (MTDC) of an award rather than ICR as one measure of research productivity. As the land grant college in a "Research I" University, CALS expects that all faculty with research appointments will conduct research programs that are supported by external grants, contracts and/or gifts. Dollars awarded and spent will therefore continue to be one important measure of progress towards fulfilling the CALS research mission of "*advancing knowledge across the continuum of basic to applied research in the mission areas of the College, and conveying the products of our efforts to the citizens of Arizona, the US and the world.*"

**New Programs and Initiatives:** To support the research efforts of CALS faculty and staff and to help enable our growth goals, over the past several years the CALS Research Office has reorganized its staff and

significantly expanded the services and programs it provides. The following activities and new initiatives have been undertaken to support and stimulate research:

1. Research grants and contracts pre award support services have been reorganized and upgraded. Through the outstanding performance of our staff, CALS pre award services have become a model for other colleges on campus.
2. A comprehensive program of training workshops and seminars has been established to serve faculty, staff and students. These include “onboarding” training for new faculty and staff, as well as refresher training for experienced employees. Understanding the “system” reduces the time and effort required to submit grants and conduct research, and also reduces frustration among faculty and staff.
3. The CALS Research Development Program has been established to stimulate new research directions and to support existing programs. College resources support the Innovation Venture Investment Grant Program (iViP), Early Career Faculty Seed Grants, Bridge Funding, and the new CALS-wide Frontiers in Life Sciences Seminar Series.
4. New initiatives and events have been developed to strengthen the CALS research culture. These include the CALS Poster Forum and the Frontiers in Life Sciences seminar series, as well as targeted communications about grant programs, training opportunities and faculty research.
5. The CALS Research Office has worked closely with the UA Vice President for Research, unit heads and faculty to support the recruitment of high caliber research scientists into CALS.
6. Support for technology transfer activities (patents, licenses, startup companies) has been enhanced through better integration with Tech Launch Arizona, leading to increased invention disclosures, patent applications, and licensing of technology to companies.

Although it’s difficult to directly attribute the above activities to increased research productivity, activities to “reduce the friction” combined with new programs are having a positive impact on CALS research. Three year rolling averages for new research awards and expenditures are trending upward. With many new faculty hires over the past three years, we are poised for continued growth of our research programs, and with it our impact on the grand challenges facing the world today.

1. Vrana, K., and Shapiro, D. Proc Natl Acad Sci USA 2015 112:9496-7