

2016 was a good year for the Basic Sciences team. Attila Karsi, Jan Chambers, and Henry Wan published 10 or more peer-reviewed papers. Matt Ross and Bindu Nanduri were close behind, and our average publication rate was 4.5 papers per faculty member. This represents a significant increase from 4 years ago when the rate was 3.1.

More grant applications were submitted in 2016 than any year that I can remember. More of our faculty have significant extramural funding that at any time since I have been here (2007). Those with significant extramural funding include: Russell Carr, \$450,000 (R15, effect of low level exposure to pesticides during fetal development to later behavior); Allen Crow, \$450,000 (R15, the role of carboxylesterase enzymes in control of cholesterol metabolism and risk of cardiovascular disease); Trey Howell, \$450,000 (R15, involvement of persistent organic pollutants in the development of type 2 diabetes); Matt Ross, \$450,000 (R15, the mechanism by which carboxylesterase enzymes enhance cholesterol exit from macrophages and decrease development of cardiovascular disease); Andrea Varela-Stokes, \$450,000 (R15, interactions between different *Rickettsia* in ticks and potential influence on transmission of infection to mammals) (in unfunded extension year); Jan Chambers, \$2,200,000 (U01, developing new antidotes to nerve agents); Jan Chambers, \$116,000 (DTRA grant, methods to enhance paraoxonase activity to increase resistance to poisoning by organophosphate compounds); Jan Chambers, \$500,000 (EPA STAR grant); Attila Karsi, \$499,000 (USDA Major grant, catfish vaccine); Attila Karsi, \$387,000 (USDA Major grant, catfish vaccine to *Edwardsiella*); Mark Lawrence and Attila Karsi, \$499,000 (USDA Major grant); Lora Petrie-Hanson and Lesya Pinchuk \$499,000 (Co-PIs, USDA Major Grant, mechanisms and improvement of catfish vaccine responses); Stephen Pruet, Mark Lawrence, Keun Seok Seo, Barbara Kaplan, Bindu Nanduri, and Henry Wan, \$10,500,000 (NIH Center of Biomedical Research Excellence on Pathogen-Host Interactions); Chinling Wang (Elanco contracts, effectiveness of poultry vaccines), \$600,000; Chinling Wang, \$50,000 (Food Safety Initiative, mechanism of *Listeria* adherence to foods); Todd Pharr, \$48,000 (USDA Cooperative Agreement, effect of lighting on poultry vaccine responses); Todd Pharr (NSF-Seed Grant, \$147,000/2 years), development of B lymphocytes in the Chicken Bursa; Keun Seok Seo, \$220,000 (QIA, South Korea, development of a vaccine to *Staphylococcus aureus*-MRSA); Henry Wan, \$1,870,000 (R01, mathematical modeling to select ideal influenza vaccine strain); Henry Wan, \$125,000 (USDA-Feral Swine, investigating the prevalence and formation of new strains of influenza virus in feral swine); Henry Wan \$425,000 (R15, understanding the cellular receptors for influenza virus and evaluating their potential to serve as a target for new therapeutic agents). Stephen Pruet, Bill Epperson, and Keun Seo prepared an application for preferred vendor status in the CDC SHEPHERD program on antibiotic resistance and MSU CVM was granted this status. Total active grants are about \$21,000,000 from a department with about 13 research FTEs. This represents much hard work and determination. Congratulations to our faculty!

Our faculty have also been honored by some very prestigious awards given to them or their mentees. Lucas Ferguson, an undergraduate who has been mentored by Henry Wan is the first MSU student to receive a Gates/Cambridge scholarship. Fewer than 40 of these awards are given nationwide, so this is a remarkable achievement. Dr. Jan Chambers was selected from among all MSU faculty members (a total of about 1100) to receive the Southeastern

Conference Faculty Achievement Award. Stephen Pruett received the Outstanding Senior Immunotoxicologist Award at the Annual Meeting of the Society of Toxicology in Baltimore. There is one more big award that I can't announce yet, but check this space in the near future!

Five of our faculty members are pursuing commercialization of intellectual property. One startup in which one of our faculty members is involved has received \$200,000 from an investor who has pledged a total of \$1,000,000. This company has also received two NIH STTR grants. Three faculty members have received U.S. patents and are working to develop their inventions. Another faculty member is exploring establishing a start-up company to develop and market a diagnostic assay that will be unique and groundbreaking.

All of this has been done in face of repeated budget cuts. Extramural funding remains our only buffer against these cuts, which seem likely to continue before any improvement occurs. The faculty members of the Department of Basic Sciences deserve much credit for their determination and skill. I try to explain to people who do not "make their living" from grant funding that it is difficult to imagine the challenges. The funding rates at the major granting agencies range from less than 10% to about 20% at best. So, our faculty spend enormous time, effort, and energy to write excellent applications, knowing that the odds are against them. When they are not funded, they handle the disappointment and quickly move on to revise the application or to prepare a different one. People who think academic researchers have an easy life just really don't understand. How many other professions require you to be consistently rated among the top 5-20% in your field to be successful? The resilience and determination of our faculty is admirable.