



Nucleus

OFFICE OF THE ASSOCIATE DEAN FOR RESEARCH

Texas Tech University HSC School of Pharmacy

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SPECIAL POINTS OF INTEREST:

- **Equipment Grant FY06 Recipients**
- **ABRI Program '06**
- **New SOP Volunteer Policy**
- **Student Recognition**
- **New Grant Opportunity**

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2005: Another Excellent Year for Research

The School of Pharmacy consistently excels in research, and this past year was no exception. In 2005, faculty investigators were awarded numerous grants to support their research projects. NIH awarded eight grants to SOP PIs, cumulatively totaling \$1,856,970. Six of those eight NIH grants were R01s, and one R15 grant and one R03 were also awarded.

Other granting agencies also supported SOP research in 2005. Grants from the Department of Commerce, Medex, the Denver Health & Hospital Authority, the Epilepsy Project, the American Heart Association, the Department of Defense, the Alzheimer's Association, the US Public Health Service, the Texas Department of State Health Services, and other agencies awarded grants to investigators at the School. These grants cumulatively totaled \$1,419,665 and were

awarded to ten researchers.

This *Nucleus* newsletter routinely highlights research publications authored by our faculty investigators. Over the 2005 calendar year, approximately 80 articles were reported as published in peer-reviewed journals.

Over the summer of 2005, the ABRI (Amarillo Biomedical Research Internships) program was launched, and nine interns were selected to work with graduate faculty in research laboratories. The work of the interns resulted in publications, and each intern presented their findings during Research Days. During exit interviews with the interns, each one of them expressed great enthusiasm for the program, and several have indicated they hope to reapply for the coming summer. Several of the interns have stayed in touch with Office

of Research staff and with the faculty members, graduate students, and post-doctoral research associates with whom they worked, and they have praised the internship for better preparing them for their biomedical courses and for their research-related jobs. One intern hopes to enroll in the SOP graduate program, beginning in the fall of 2006. She credits the ABRI program as an experience that presented her with possibilities for future careers that she had not previously considered. She now plans to pursue a career in research.

With so many success stories at our School, the Office of Research is proud of our high-caliber faculty, students, and staff, and we are also proud that we can boast of the research accomplishments of our dedicated investigators. Our thanks and congratulations go out to all SOP researchers.

An SOP Seed Grant Success Story

In fiscal year 2003, Dr. Mike Veronin (Assistant Professor, Pharmacy Practice) received a seed grant, sponsored by the Office of Research. The seed grant program is intended to support preliminary research that can be used when applying for larger extramural grants, and for Dr. Veronin, it worked exactly as intended. With seed grant funds, he was able to conduct a few preliminary studies that led to publications, which enabled him to successfully apply for and receive a two-year \$124,000 grant from the Texas Affili-

ate of the American Heart Association (AHA) in July of 2005.

The project, entitled "Quality Assessment of Statins Obtained from the Internet," is an interdepartmental collaborative effort involving the co-investigators Dr. Celestin Youan (Assistant Professor, Pharmaceutical Sciences) and Dr. Roland Patry (Professor and Chair, Clinical Practice & Management) and research technician Nga Nguyen. Dr. Veronin also plans to engage the expertise of United States Pharmacopeia (USP)

consultants to further validate their findings. (The USP is the official public standards-setting authority for all prescription medicines manufactured and sold in the United States.)

As Dr. Veronin describes it, the investigation is multifaceted; it involves technology, pharmaceutical science, and public health issues that have not been addressed in previous investigations or published reports.

The Internet is changing healthcare delivery in ways that could not have

An SOP Seed Grant Success Story (continued from page 1)



**Mike Veronin, R.Ph.,
Ph.D.**



Celestin Youan, Ph.D.



Roland Patry, D.Ph.

“This investigation involves studying the quality of the major statin drugs, Zocor® and Lipitor®, sold on the Internet in generic form to U.S. consumers.”

been imagined just a few years ago. It has provided a new opportunity for U.S. consumers to purchase drugs online (often at greatly-reduced costs) from companies in other countries; however, no formal, published studies can be found in the literature that evaluate the comparative quality/equivalency of the drugs themselves. The U.S. Food & Drug Administration (FDA) has conducted internal studies, but consumers and outside scientists have had little information regarding the quality of drugs imported into the U.S. from other countries via the Internet.

This investigation involves evaluating the quality of the major statin drugs, Zocor® and Lipitor®, sold on the Internet in generic form to U.S. consumers. (Statins are one of the most sought-after prescription drugs sold via the Internet.) While quality control for some types of drugs may not be as crucial, with drugs such as the statins that help prevent or moderate heart disease and stroke, quality assurance becomes essential. The American Heart Association has great interest in verifying that the drugs available to patients from the Internet are equivalent in quality to those manufactured and sold from U.S. companies. What value is there for a patient to save money from drugs purchased on the Internet if the quality is so poor that there is no benefit—or even health risk? The AHA is looking to our School’s research team to find some answers.

In the initial stages of the study, Dr. Veronin has been looking at statin drugs imported from Canada via the Internet. In reaction to Texas Senate Bill 410 (passed by the legislature on June 18, 2005, which would require the Texas State Board of Pharmacy (TSBP) to inspect and authorize Canadian pharmacies to import prescription medications into the state of Texas), the FDA has requested additional information

from the Texas Attorney General. While the law originally called for the TSBP to designate eligible Canadian pharmacy exporters on the Board’s website on March 1, 2006, the FDA’s request for additional information has at least temporarily suspended importation of Canadian drugs to consumers in Texas. The primary concern iterated by the FDA is: “We cannot provide adequate assurance to the American public that the drug products delivered to consumers in the United States from foreign countries are the same as products approved by the FDA.” [Source: <http://www.fda.gov/oc/opacom/hottopics/importdrugs/perry061705.html>]

To date, Dr. Veronin has found 83 websites of pharmacies in Canada that sell the statin drugs Zocor® and Lipitor® to U.S. consumers and has received drug samples from several of those companies. Further plans include obtaining samples from international markets from countries around the world. And such additional study appears to be exactly what not only the AHA but also the FDA are hoping for. AHA is actively funding research endeavors like Dr. Veronin’s, and the FDA has noted some concerns regarding importing prescription drugs into the U.S.

Dr. Veronin and his research team plan to address this very concern by evaluating the potency, dissolution, disintegration, composition, and, simply put, the overall quality of the study drugs from Canadian and other international pharmacies. With the assistance of Dr. Ronda Akins, they will also conduct microbial contamination testing. [Dr. Veronin’s recently-awarded SOP equipment grant will support the acquisition of equipment necessary to run drug qualitative and quantitative analyses using HPLC (High Performance Liquid Chromatography).]

This issue of importing drugs is one that is obviously politically—and economically-charged. As often touted by politicians and consumer groups, medications from US pharmaceutical companies can be extremely expensive. For example, consumers can get a month’s supply of one of Dr. Veronin’s study drugs for about \$60 on the Internet, while the drug made and sold in the U.S. can cost as much as \$140. Dr. Veronin’s research team hopes to address the question of whether or not the savings is worth the risk to consumers; if the quality of Internet-purchased medications is equivalent to those made and sold in the U.S. Or, if the quality is assured as similar or equivalent, the migration of US consumers to foreign country Internet drug suppliers may be inevitable and will have a significant negative economic impact on the U.S. pharmaceutical industry.

Dr. Veronin cautioned that while this study is certainly a good start, with a relatively small sampling and focus on a limited number of countries, this project will not allow for absolute conclusions. However, it will offer initial information to pave the way for much-needed future studies.

The Office of Research would like to applaud Dr. Veronin for beginning this important line of questioning. We congratulate him not only for receiving the AHA grant but also for taking advantage of two internally-sponsored grant programs; (the seed and equipment grants) to help make this research possible. In addition, Dr. Veronin has recently been recognized as the recipient of the 2005 TTUHSC President’s Young Investigator Award for his work in health informatics and telemedicine/telepharmacy applications (awarded November 29, 2005) and for receiving the Frances Larson Memorial Award for excellence in medical writing by the American Writer’s Association.

Name in the News

Celestin Youan, Ph.D. (Assistant Professor, Pharmaceutical Sciences) was awarded a two-year National Institutes of Health (NIH) grant for \$205,867 to study a noninvasive pulmonary delivery system using novel microparticulates. The grant, entitled "Heparin Containing Microparticles for Pulmonary Delivery," is the second that Dr. Youan received in 2005. [His previously-awarded grant, awarded also to co-investigator Dr. Karin Borges, was given by The Epilepsy Project in July.]



New Policy in SOP Research

The Office of Research, with the ad hoc Research Advisory Committee, developed a policy for SOP research laboratory volunteers (including minors) that has received Executive Committee approval — please refer to OP 73.P.05 at: <http://www.ttuhsu.edu/sop/administration/policies/>.

Equipment Grant Recipients for FY06

The ad hoc Research Advisory Committee, through the Office of Research, awarded five equipment grants for fiscal year 2006.

Congratulations to the following faculty PIs who received grants:

Ulrich Bickel, M.D. — upgrade of Leica TCS SL confocal microscope with live cell incubation system. Collaborators: Drs. Ab-

bruscato, Lockman, Rao, and Srivenugopal

Jochen Klein, Ph.D. — CMA-600 Microanalyzer. Collaborators: Drs. Abbruscato and Van der Schyf

Mark Lyte, Ph.D., M.S., MT (ASCP) — Kodak Image-Station FX *in vitro* System. Collaborator: Dr. Akins and SOM researchers. This will be a Lubbock School of Medi-

cine instrument.

Michael Veronin, R.Ph., Ph.D. — Beckman HPLC Autosampler Model 508. Collaborator: Dr. Akins

Margaret Weis, Ph.D. — Beckman TL-100 Benchtop Ultracentrifuge Rotors. Collaborators: Drs. Ahsan, Mehvar, Rao, and Stoll

ABRI Program Summer 2006: Seeking Faculty Mentors

While summer still seems like a long way off, the Office of Research has begun making plans for this year's ABRI (Amarillo Biomedical Research Internships) program. Brochures have been shared with prospective interns, and applications will be coming in through March. Selections of interns will be made the first couple of weeks in April, and we will move as quickly as possible to get the interns ready to start their work in a research laboratory by late May.

The mission of this program is to foster an interest in promising area college-level or professional-degree-level students in pursuing a career in biomedical research. As a short-time goal, it is hoped that interns will become interested in the School of Pharmacy's graduate program in biomedical sciences. And last year's internship may have resulted in just such a success, with one intern planning to

apply for graduate school in the fall of 2006.

Because of these program goals, graduate faculty mentors in research laboratory settings are sought for the program. Interns will be placed in laboratories that are already fully operational, with investigator-initiated research projects, and with research team members in addition to the faculty member (i.e. graduate students, post-doctoral research associates, technicians).

Faculty mentors are asked to contribute 1/2 of the stipend offered to his/her selected intern. Stipends for the coming summer will amount to \$3,300 total. The Office of Research will provide \$1,650 of each intern's stipend.

The program is a ten-week internship beginning in late May and concluding with Research Days, when interns are expected to present their research findings alongside other

School investigators.

Every effort will be made to place interns in laboratories of interested faculty researchers in Dallas and/or Lubbock. The intern applicants themselves will likely determine whether or not they will work on those campuses, but if you are a faculty member interested in this program, please encourage your local students to apply to the program.

If you are interested in sponsoring an ABRI intern for the coming summer, please notify Melissa Lockman (Melissa.Lockman@ttuhsu.edu, 806-356-4000, ext. 326) as soon as possible so that plans can be made for your laboratory. We look forward to a second great year of internships. For additional information, please see: <http://www.ttuhsu.edu/sop/research/abri.aspx>

Faculty Publications (October-December 2005)

Akaho E, **Brouse SD**, Kambara H, Kawasaki K. Enhancing the pharmacist's professional status through collaborative prescribing: US and Japanese perspectives. *Jpn J Pharm Health Care Sci* 2005; 31(11):869-882.

Brouse SD. Assessing the use of heparin for the prevention of venous thromboembolism. *Am J Health Syst Pharm*. 2005 Nov 15;62(22):2338, 2342.

Brouse SD, Leff RD, Vu KL. Clinical outcomes following fluid restriction in heart failure exacerbation. *Critical Care Med* 2005;33(12):213-S.

Brouse SD, Umezawa C, Kawasaki K. Evolution of a Clinical Pharmacy Degree Program: A US Perspective. *Jpn J Pharm Health Care Sci* 2005; 31(12):969-977.

Busti AJ. Appropriate use of statins with antiretrovirals. Are we making improvements? [Invited Commentary]. *Contagion*. November 2005; 2(11):1-4.

Busti AJ, Hooper JS, Amaya CJ, Kazi S. The influence of anti-inflammatory agents on wound healing in the post-surgical pa-

tient. *Pharmacotherapy* 2005;25(11):1566-1591.

Hussain A, Majumder QH, Ahsan F. Inhaled Insulin is Better Absorbed When Administered as a Dry Powder Compared to Solution in the Presence or Absence of Alkylglycosides. *Pharm Res*. 2005 Dec 7; [Epub ahead of print]

Mathys M. Pharmacologic agents for the treatment of obesity. *Clinics in Geriatric Medicine*. Nov 2005; 21(4): 735-746.

Mazzolini T, Irons B, Schell E, Seifert C. Lipid levels and use of lipid-lowering drugs for patients in pharmacist-managed lipid clinics versus usual care in 2 VA medical centers. *Journal Managed Care Pharmacy (JMCP)*. 2005;11(9):763-71.

Niture SK, Doneanu CE, Velu CS, Bailey NI, Srivenugopal KS. Proteomic analysis of human O6-methylguanine-DNA methyltransferase by affinity chromatography and tandem mass spectrometry. *Biochem Biophys Res Commun*. 337, 1176-1184, 2005.

Niture SK, Velu CS, Bailey NI, Srivenugopal KS. S-Thiolation mimicry: Quantitative and kinetic analysis of redox status of protein cysteines by glutathione-affinity chromatography. *Arch Biochem Biophys*. 444, 174-184, 2005.

Rudd KM, Raehl CL, Bond CA, Abbruscato TJ, Stenhouse AC. Methods for assessing drug-related anticholinergic activity. *Pharmacotherapy*. 2005 Nov;25(11):1592-601.

Stanford BL, Armstrong JE. Drug Utilization Evaluation of Pegfilgrastim Use in a Large Academic Medical Center. *TSHP Journal* 2005;6:14-16.

Stanford BL, Shah SR, Ballard EE, Jumper CA, Rabinowitz I, Dowell JE, Hunt WC, Krieger JA. A Randomized Trial Assessing the Utility of a Test Dose Program with Taxanes. *Current Medical Research & Opinion* 2005;21:1611-1616.

Veronin M. One step forward, two steps back: The World Wide Web as an information resource. *Pharmacy Education*. 2005; 5(3): 1-6.

Research Seminars

Every Monday during the school year, faculty and graduate students present research seminars. The Office of Research sponsors one of these monthly presentations, which is health-netted, and the other seminars are provided by the Pharmaceutical Sciences Department.

Below is a summary of the seminars that took place in the last few months.

10/3/05-Celee Spidel, Graduate Student, Department of Pharmaceutical Sciences. "Is RON 55 an Oncogenic Agent That Could Play a Role in Colorectal Cancer?"

10/3/05-Cornelia Kiewert, Graduate Student, Department of Pharmaceutical Sciences. "Mechanism of Action and Neuroprotective

Effects of Bilobalide, a Constituent of Ginkgo Biloba."

10/10/05-Jayarama Gunaje, Ph.D., Associate Professor, Department of Pharmaceutical Sciences. "Alpha-Thrombin-Induced Tyrosine Phosphorylation of GRP-75 in Lung Fibroblasts: An Unexpected Finding."

10/24/05-Haritha Mandula, Graduate Student, Department of Pharmaceutical Sciences. "Kinetic Analysis of the Role of Plasma Protein Binding on Brain Drug Uptake: Effect of Site Specific Binding and Flow."

10/24/05-Jagan Parepally, Graduate Student, Department of Pharmaceutical Sciences.

"Factors Limiting Nonsteroidal Anti-Inflammatory Drug Uptake and Distribution in Central Nervous System."

11/16/05-Dr. Walter G. Thomas, Head, Molecular Endocrinology, Baker Heart Research Institute, Melbourne Victoria Australia. "Hijinks and Hijacking by the Angiotensin Type 1 Receptor."

11/21/05-Nusrat Motlekar, Graduate Student, Department of Pharmaceutical Sciences. "Effect of Permeation Enhancers on the *in vitro* and *in vivo* Permeability of Ardeparin."

11/21/05-Nikhil Vad, Graduate Student, Department of Pharmaceutical Sciences.

Research Seminars (continued from page 4)

“Tyrosinase as a Molecular Target for Development of Anti-Melanoma Drugs.”

11/28/05-Glen S. Kwon, Ph.D., Associate Professor, Pharmaceutical Sciences Division, University of Wisconsin-Madison. “ABC Micelles for Nanoscale Drug Delivery.”

12/5/05-Chandan Thomas, Graduate Student, Department of Pharmaceutical Sciences.

“Delivery of Hepatitis B Vaccine via the Respiratory Mucosa.”

12/5/05-Sharanya Vemula, Graduate Student, Department of Pharmaceutical Sciences.

“Role of Glucose Transporters GLUT1 and SGLT1 at the BBB During Stroke.”

12/15/05-Jason Crumley, Graduate Student, Department of Pharmaceutical Sciences.

“Inhibiting Long-Chain Fatty Acyl CoA Synthetase Does Not Increase Agonist-Induced Release of Arachidonate Metabolites from Human Endothelial Cells.”

12/15/05-Nathan Bailey, Graduate Student, Department of Pharmaceutical Sciences.

“Interaction of the DNA Sliding Clamp PCNA with MGMT Repair Protein in Human Cells.”

Graduate/Post-Graduate Student Research Corner

Routinely, graduate students in the Pharmaceutical Sciences Department who are enrolled in the Graduate School of Biomedical Sciences receive commendations in the greater scientific community. Our pharmacy residents represent our school in the local health community and conduct clinical research projects as part of their work while here. They are also frequently recognized at local, state, and national levels. Post-doctoral research associates energize the research program at the School by bringing new techniques learned in other programs. They are

often instrumental in obtaining grants and are frequently singled out for their research endeavors and excellence.

With so many names regularly in the news, we're starting this new column to specifically highlight the research achievements of our pharmacy students, residents, and graduate students. In this first column, we have undoubtedly missed many. We apologize but encourage all of you students to communicate with Melissa Lockman, Research Administrator, via email (melissa.lockman@ttuhsc.edu)

or by phone (806-356-4000, 326).

Fancy Thomas accepted one of four awards available to graduate students in Pharmaceutical Sciences. She was awarded the 2005 American Association of Indian Pharmaceutical Scientists (AAiPS) at the AAiPS annual meeting on November 9. She presented her research at the annual meeting, which was held in Nashville, Tennessee.



Open Forum

The Office of Research and ad hoc Research Advisory Committee would like to seek opinions from all faculty on the issues that affect the overall research program at the School and/or individual faculty researchers. This new “Open Forum” column will be regularly featured in this quarterly newsletter. Please share your opinions with Melissa Lockman, Research Administrator, via email (melissa.lockman@ttuhsc.edu) or by phone (806-356-4000, 326).

- **Reorganization of the SOP research support Infrastructure.** In order to ensure that SOP resources are fairly distributed and that all faculty have equal access to School resources, a reorganization of the support structure is planned for the future.
- **Mentoring Program.** Many of you have already offered opinions on how to structure a research mentoring program

in the School. We appreciate all recommendations; however, the ad hoc Research Advisory Committee is still evaluating how best to implement a research mentoring program and would welcome additional suggestions/comments. Particularly if you have participated in programs at other institutions, please share your recommendations with Ms. Lockman.

Upcoming Events/Deadlines

2006 Wendy & Stanley Marsh 3 Endowed Lectureship in Pharmacology and Neurochemistry of Substance Abuse/Addiction

The 2006 Marsh lecture will be scheduled for two days in March. Specific announcements will be made as soon as the speaker is confirmed. As always, the speaker will be a rec-

ognized research expert in the pharmacologic area of substance abuse and the neurochemistry that precipitates this behavior.

ABRI Program

The deadline for **students** to apply for the internship is **5 p.m. Friday, April 7, 2006.**

Faculty members interested in serving as mentors must notify Melissa Lockman (Melissa.Lockman@ttuhsc.edu, 806-356-4000, ext. 326) by **5:00 p.m. on Friday, March 3, 2006.** The internship is a 10-week program, beginning in late May and concluding at Research Days (late July).

Upcoming NIH Deadlines

T series grants-Cycle I-January 10; Cycle II-May 10; Cycle III-September 10.

R15 grants-Cycle I-January 25; Cycle II-May 25; Cycle III-September 25.

P series grants-Cycle I-February 1; Cycle II-June 1; Cycle III-October 1.

New Research grants (R01, R03, R21)-Cycle I-February 1; Cycle II-June 1; Cycle III-October 1.

Renewing Research grants (R01, R03, R21)-Cycle I-March 1; Cycle II-July 1; Cycle

III-November 1.

New K series grants-Cycle I-February 1; Cycle II-June 1; Cycle III-October 1.

Renewing K series grants-Cycle I-March 1; Cycle II-July 1; Cycle III-November 1.

New Education grants (R25)-Cycle I-February 1; Cycle II-June 1; Cycle III-October 1.

Renewing Education grants (R25)-Cycle I-March 1; Cycle II-July 1; Cycle III-November 1.

SBIR & STTR grants (R41, R42, R43, R44)-Cycle I-April 1; Cycle II-August 1; Cycle III-December 1.

Individual Kirschstein Awards (F30, F31, F32, F33)-Cycle I-April 5; Cycle II-August 5; Cycle III-December 5.

Conference Grants/Agreements (R13, U13)-Cycle I-April 15; Cycle II-August 15; Cycle III-December 15.

AIDS grants-Cycle I-May 1; Cycle II-September 1; Cycle III-January 2.

Announcement

President Wilson has approved a request from the Office of Research for a new grant program for FY06: the Research Enhancement Grant. These grants will provide funding to investigators (at any level, from assistant to

full professor) to pursue promising and novel ideas that will likely be fundable. Similar to a seed grant, these Research Enhancement grants will allow investigators to gather adequate data to pursue larger extramural grants.

Additional information will be coming soon via an email from the Office of Research. Please be looking for it!

Correction

In the last issue of this newsletter, we erroneously reported that **Drs. Bickel and Klein** had each received a \$125,000 grant as part of the Cardiovascular Seed Grant Program.

In fact, Dr. Bickel received \$19,082 and Dr. Klein received \$13,961.

The Lubbock-based Center for Cardiovascu-

lar Disease and Stroke provides these grants for basic and applied research related to cardiovascular disease. The funds will be awarded July 1.

OFFICE OF RESEARCH

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To include information in the April edition of this newsletter, please submit materials to:

Melissa Lockman, melissa.lockman@ttuhsc.edu OR fax 806-356-4643 by 5 p.m. on Friday, March 10, 2006.