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NSF Award to Study Chestnut Blight

The National Science Foundation has recently awarded NMSU Assistant Professor and Biology Department faculty member Dr. Angus Dawe a grant to study the molecular biology of the fungus responsible for the blight of the American chestnut tree. Introduced into the US on resistant Asian chestnut species, *Cryphonectria parasitica* was responsible for the loss of an estimated four billion chestnut trees. Once dominant from north Georgia to New England, the American chestnut was a widely used resource the loss of which represented a major economic disruption during the first half of the twentieth century.

The chestnut blight fungus provides an excellent model system for studying how a fungus invades a plant. Other fungi cause significant agricultural losses worldwide and better understanding of these mechanisms will enable more effective control. One possibility is the use of mycoviruses (viruses that infect fungi) as a method of biological control. A group of viruses, called hypoviruses, specifically infects the chestnut blight fungus and renders it less effective as a pathogen.

The objectives of the recently funded project are to characterize molecular mechanisms by which the virus alters the ability of the fungus to respond to external

stimuli. Joanna Salamon-Kozubowska, NMSU Ph.D. graduate student and recipient of a Biosciences Cluster fellowship, collected preliminary data for the proposal including identification of a specific protein target for the studies as well as the method development.

The grant is entitled "Role of heterotrimeric G-proteins and related components in hypovirulence and virulence of the plant pathogen *Cryphonectria parasitica*." Worth \$398,334 over three years, it will support both graduate and undergraduate researchers in Dr. Dawe's laboratory. Students are also supported by mechanisms that include the NIH-RISE and NIH-Bridges programs and the Howard Hughes

Dr. Dawe is also currently a collaborator with eleven other researchers from institutions across the US, Canada, South Africa, Korea and China in an effort to develop a complete genome sequence for the chestnut blight fungus. Supported by the Joint Genome Institute of the US Department of Energy, this work will be completed in 2008.

Further information about Dr. Dawe's laboratory can be obtained from

<http://biology-web.nmsu.edu/dawe> and

<http://chestnut.nmsu.edu/index.html>

Calendar of Research Funding Opportunities

Calendar of research funding opportunities is now available online at:

<http://research.nmsu.edu/baa>

The purpose of the calendar is to provide NMSU faculty and staff with one-step access to information about research funding opportunities and is maintained and updated by the Office of Strategic Initiatives (OSI). OSI is a new office established by the VP for Research, Graduate Studies, and International Programs with the goal of more effectively supporting researchers at NMSU through a number of services.



Dr. Angus Dawe (right) and Biology graduate student Joanna Salamon-Kozubowska (left)

Medical Institute-NMSU Undergraduate Research Scholars program.

A team of faculty and students in the Agricultural Economics and Agricultural Business Department analyzes water issues facing New Mexico and other water-stressed regions and on their policy solutions. That team includes Leeann DeMouche, Serkan Gurluk, Macarena Dagnino, and Frank Ward.

Agriculture consumes 90 percent of New Mexico's water supplies. Much of our



team's recent work is taking a basin scale view on water conservation in agriculture. Our intent is to find out how changes in water supplies and policies implemented in one location affects water uses and users in other places. To date, we have focused on New Mexico's largest basin, the Rio Grande.

Economic incentives are proving to be a major factor influencing water use. For example, New Mexico's farmers are willing to risk investments in costly technologies like drip irrigation only when they avoid losing the right to use their saved water. New Mexico's river basins are being adjudicated to promote increased security of tenure in water rights. But the adjudication process is slow and will take years to complete. So we are taking a special look

at how laws, regulations, and organizations can be designed to encourage water conservation from a basin view.

Real and effective water savings means freeing up water from low-valued uses and making it available for higher economic-valued uses. In agriculture, for example, we are looking at ways to increase the agricultural income while making more water available for the industry, the environment, and cities. One good example of effective water conservation is to reduce flows to sinks for example, deep or saline aquifers from which the water cannot be economically recovered.

In some cases, improving irrigation efficiency is the most economical way to save water. But we've found it's important to guard against searching for water savings only from the farm or irrigation system level while ignoring the basin scale hydrology. For example, drainage water is often captured and reused by farmers before it gets back into the river system to be used downstream. This action promotes conservation from the farm view, but not for the basin. One farmer's sloppy water management can be somebody else's water supply.

Thanks to generous funding by the Rio Grande Basin Initiative, we've been able to develop an integrated basin-wide analysis of the hydrology, economics, and institutions for the Rio Grande Basin. The scale of our analysis ranges from the headwaters in southern Colorado, to the end of the upper basin just downstream of El Paso, Texas. We've published early results of the model in several peer re-

viewed journals. More recently we've used the model to conduct some simple policy analysis. But much work lies ahead and funding is competitive and scarce. For example, we hope to soon finish posting a simple version of the model on our NMSU web page. Our goal is for policy makers and others to use it for various water policy experiments. We also hope to apply the model to other basins in New Mexico, for example the Pecos Basin, which has been the subject of much controversy since the early 1980s. ***Continued on page 5.***



Dr. Vimal Chaitanya

Message from the VP for Research, Graduate Studies, and International Programs

Welcome to the first newsletter from the Research Office. We plan to bring these newsletters to you every two months. The circulation is primarily intended to be internal to NMSU, and the purpose is quite simple. Through the research success stories and stories in the making, we want you to be informed about what is happening across the NMSU campuses statewide, while recognizing and appreciating the newsmakers. We will also use this forum to share with you general interest items but above all, this newsletter is about celebration--celebration of your success. Your success is NMSU's success and your story is NMSU's story, so please write to us and join in the kudos!

Research Program on HIV/AIDS in Brazil

Professor Carl Kendall, recently recruited to NMSU, has an ongoing research program in Brazil with colleagues at the Federal University of Ceara in Northeastern Brazil. This summer two new proposals prepared with colleagues there were funded by Brazilian authorities. The first - funded by Brazil's equivalent of NIH: CNPq - measures the quality of life of persons living with HIV/AIDS and their children. The first such study to be conducted in Brazil ad-

resses the health and social concerns of the growing population of Brazilian HIV seropositives and their families on antiretroviral treatment. The second study, funded by the Brazil HIV/AIDS program measures risk behaviors in 10 cities of men who have sex with men. This study utilizes a new sampling methodology to survey hard to reach populations called Respondent Driven Sampling that Profes-

ing to Brazil. The method permits a probability based sample in the absence of a population list or map and will improve the evaluation of HIV/AIDS prevention programs.



Professor Carl Kendall

BIG READ COMES TO LAS CRUCES

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The New Mexico State University Library has been awarded a \$10,000 grant by the National Endowment for the Arts (NEA) to present a Big Read festival to be held in Doña Ana County this fall.

The Big Read is a national initiative of the NEA, in partnership with the Institute of Museum and Library Services and Arts Midwest, that encourages reading by asking communities to come together to read and discuss books. Big Read grants were awarded to 117 communities nationwide this spring.

The month-long Doña Ana County festival will feature a variety of programming and activities for all ages, promoting the community-wide reading of the novel "Bless Me, Última" by New Mexican author Rudolfo Anaya.

The success of this project is dependent upon securing matching funds from businesses and private donors in our community. NMSU and the Community Foundation of Southern New Mexico are partnering in the fundraising effort.

The Thomas Branigan Memorial Library, the libraries of the Las Cruces Public Schools, the Doña Ana Arts Council, the Community Foundation of Southern New Mexico and many more community partners will sponsor book discussion groups, programs, contests, and other events related to "Bless Me, Última."

Project director Mardi Mahaffy, the Humanities Librarian at the NMSU Library said, "We are excited to join together in encouraging

everyone to celebrate Anaya's classic novel. The festival will bring local families together toward a common goal of reading. And it will be a lot of fun."

Organizations interested in participating in the Big Read are invited to contact Mahaffy at (505) 646-6925 or mmahaffy@lib.nmsu.edu.

Contributors wishing to support the Big Read festival are asked to please send a check payable to the Community Foundation of Southern New Mexico.

For more information on contributions, please contact Connie Loyd at (505) 646-3642 or clouloyd@nmsu.edu.

NMSU Graduate Student Selected for Scholarship to National Biomedical Computation Resource



Sidath C. Kumarapperuma

Sidath C. Kumarapperuma, a Ph.D. candidate in the Department of Chemistry and Biochemistry, was selected as a 2007 National Biomedical Computation Resource (NBCR) Summer Institute Scholarship Recipient. He was selected for this award from a strong international pool, and each of the seven recipients will present their research during the symposium held July 30 - August 3, 2007.

Sidath's dissertation research focuses on the design and synthesis of new antiviral drugs targeted against (-)RNA viruses, including hantaviruses and influenza. He is in the fourth

year of his graduate studies at NMSU in the laboratory of Professor Jeffrey B. Arterburn, and has recently published a manuscript titled "Structural effects on the phosphorylation of 3-substituted 1-beta-D-ribofuranosyl-1,2,4-triazoles by human adenosine kinase" in *Bio-org. Med. Chem. Lett.* 2007, 17, 3203-3207.

In this study, computational descriptors of the synthetic triazole-beta-D-ribonucleosides were analyzed in conjunction with manual docking into the hADK substrate binding site to correlate structural effects on phosphorylation of these potential antiviral compounds with experimental hADK activities. His proposal for the NBCR Summer Institute Workshop involves the extension of this investigation using Autodock for the computational optimization of isosteric nucleoside analogs. This research is directed towards the development of new antiviral drugs that are more potent and have fewer side effects. <https://www.nbcr.net:443/forum/viewtopic.php?t=175>

Congratulations to the following recipients:

Bruno Contreras Moreira, Universidad Autonoma Nacional de Mexico (UNAM)

Dario Ghersi, Mount Sinai School of Medicine, New York, NY

Tracey Freitas, University of Hawaii, HI

Pamela Hall, Case Western Reserve University, Cleveland, OH

Sidath Kumarapperuma, New Mexico State University, NM

Milan Mijajlovic, University of Edinburgh, UK

Shantanu Sharma, University of North Carolina, Chapel Hill, NC

Jui-Chih Wang, National Taiwan University, Taiwan

12 New Undergraduate Research Initiative Grant Recipients

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Now in its second year, the Undergraduate Research Initiative Grants program has funded a total of twenty-nine student researchers. URIGs are intended to increase the involvement of undergraduate students in mentored research and encourage them to pursue graduate-level research and study.

The Office of the Vice President for Research congratulates the following 12 new awardees and their faculty mentors:

- Daniel Acosta, "Longevity and Mitochondrial Control Region Duplications in Parrots," with Dr. Timothy Wright, Biology
- Erin Bastian, "Tests for Positive Selection Among Free-living and Symbiosis Genes," Dr. Michelle Nishiguchi, Biology
- Valerie Greif, "Relating Fish Abundance and Condition to Environmental Factors in the Desert," with Dr. Wiebke Boeing, Fishery and Wildlife Sciences
- Neil Jesko, "Efficient Irrigation for Water RGM AES,," with Dr. David C. Thompson, Entomology, Plant Pathology and Weed Science
- Carol Lange, "Locoweed Management: Integrated Management, Ecology, and Toxicology," with Dr. Tracy Sterling, Entomology, Plant Pathology and Weed Science
- Trung Le, "Frameworks for the Development of Scalable and Efficient Knowledge-based Systems," with Drs. Son Tran and Enrico Pontelli, Computer Science
- Jesse McAvoy, "Development of a UAV Course project," with Dr. Ou Ma, Mechanical Engineering
- Shawna McLain and Kiane Pound, "Examining the Market Potential for Premium Quality Chile Rellenos," with Dr. Jay Lillywhite, Agricultural Economics
- Angel Romero, "The Economic Feasibility of Growing, Processing, and Marketing Natural Dyes on Rural Cooperatives in Jordan," with Dr. William Gorman, Agricultural Economics
- Arley Torres, "Adsorption of Gases in MOFs for Fuel Cell Applications, Solar Desalination with Membrane Distillation," with Dr. Shuguang Deng, Chemical Engineering

These students will present the results of their research in the annual Undergraduate Research and Creative Arts Symposium. Awards for the best poster and presentation by a URIG recipient will be made at the symposium.

URIG funds are still available on a first-come, first-served basis for 2007-2008. Application forms and guidelines may be found at: <http://research.nmsu.edu/ovpr.html>



For additional information, contact Dr. Laurie Churchill at ljchurch@nmsu.edu or 646-4015.

Dr. Laurie Churchill



Wayne Placek Research Award

Dr. Eve Adams recently received a Wayne F. Placek Small Grant for \$4600. The grant is

awarded by the American Psychological Foundation to encourage scientific research to increase the general public's understanding of homosexuality and to alleviate the stress that gay men and lesbians experience in this and future civilizations. Dr. Adams' project is titled, "Experiences of Religious People Who Are LGBT Affirmative" and she is conducting this research with Dr. Todd Savage, Dr. Betsy Cahill, and CEP doctoral student, Virginia Longoria.

Dr. Eve Adams

William Eamon Presents Research at International Conferences in Spain

William Eamon (Regents Professor of History) was recently invited to present his research at two international conferences in Spain. Eamon presented a paper on "The Scientific Revolution and the Rhythms of Everyday Life" at a conference on the Scientific Revolution in Madrid on May 24. He also presented a paper, "Appearance, Artifice, Reality: Collecting Secrets in a Courtly Culture," at an international conference on "Art and Science in Baroque Spain" in Huesca on May 30. In Huesca, Eamon was interviewed by the



Dr. William Eamon (left)

regional newspapers 'El Periodico de Aragón' and 'Diario de AltoAragón'.

Graduate Student Grants in Geological Sciences

Graduate student Eric Gottlieb received a \$3500 specialized grant from the Geological Society of America. He was awarded one of three Harold T. Stearns Fellowship Awards and was one of 15 who received a specialized grant out of the 474 applicants. Tyler Hannah and Breanna Hennessy both received AAPG grants-in-aid this year, and Thomas Hearon received a Gordon I. At water Memorial Grant from AAPG.



Eric Gottlieb

Submit NMSU research-related news online at research.nmsu.edu/news

Foul Language in Renaissance Italy: Assistant Professor of History to Publish Research with Cambridge University Press

Assistant Professor of History Liz Horodowich will publish her book "Language and Statecraft in Early Modern Venice" with Cambridge University Press in 2008. Professor Horodowich received her Ph.D. in European History from the University of Michigan in 2000, and has published numerous articles on Italian Renaissance history since then. Her forthcoming book focuses on trials of heresy, blasphemy, and insults from the state archives of sixteenth-century Venice. By looking at the foul language that everyday people flung at one another, including sailors, merchants, breadbakers, gondoliers, and courtesans, Horodowich demonstrates how control over language was fundamental to the state's control over the lagoon city. Her study is particularly path breaking because she considers the colorful language of everyday people inter-

acting on the streets of the Renaissance city rather than language from printed texts. In this way, her book offers much insight into daily life in Renaissance Italy, including verbal exchange, the way the state prosecuted swearing, cursing, blasphemy, and other forms of foul language, and the ways that savvy individuals resisted or subverted such controls.



Dr. Liz Horodowich

"NMSU Water Policy Research" continued from page 2

Similar methods can be used to support the use of science to rationally address policy solutions in other water-stressed basins of the world, such as the Tigris-Euphrates and Nile. Our future research plans include conducting a range of analyses of water policies that will:

- Search for cost effective methods to promote and apply water conservation.
- Improve existing water supply-increasing technologies.
- Assess levels of vulnerability of New Mexico aquifers.
- Improve the affordability of improved water quality.
- Promote better decisions by measuring the economic value of water in its various uses.
- Reduce tensions in the management of transboundary waters.

Supporting Collaboration across Languages for Coalition Forces



Dr. Bill Ogden

With funding from the Army Research Lab, Dr. Bill Ogden (PSL) and a group of Psychology Graduate Students have developed new protocols

for evaluating machine translation capabilities for supporting military and civilian cooperation using instant messaging in multiple languages. Embedded in the instant messaging is software technology to automatically translate the chat entered by one user into the language of all the other users. These innovative evaluation protocols are designed to get at the heart of the issues associated with trying to communicate with others who do not share one's language. Additionally, these protocols have been designed to transition easily to Army testing environments for acquisition testing of machine translation software in systems intended for coalition forces.

The NMSU group is working to answer

critical and fundamental issues regarding translation capability in what appears to be an important new application for MT.

Machine Translation software typically suffers from a set of known problems. For example, syntactic and lexical ambiguity in the source and target languages can lead to poor translations due to word selection errors. So far, one of the most pervasive of findings in the group's investigations is the observation that these poorly translated messages slow participants down, but do not prevent them from communicating and sharing task relevant information. Participants engage in repair dialogs and other strategies that largely depend on knowledge of the task domain.

"In one protocol, as with our previous research, each speaker has a map with different information and they are asked to work on a logistics problem" Dr. Ogden says. Unlike the team's earlier studies, tasks are given in discrete trials to better assess performance across language pairs and translation technologies. The team is currently concluding collecting participant performance with this protocol and are in the process of summarizing the data. "We have tested pairs of English-Korean and English-Chinese participants using two different translation systems" Dr. Ogden added.

In the other protocol, each test participant uses a shared interactive whiteboard map. They take turns communicating a battle plan to a partner using text messaging and the shared whiteboard. This protocol addresses a need to understand how these collaborative tools (like a Common Operating Picture) change the translation requirements for cross language communication. "We have completed the development of the whiteboard application, and have completed data collection with Korean-English pairs of participants with military planning experience" Dr. Ogden stated.

The groups has briefed these new methodologies, along with the results of their research from previous years, to several principals in the government who are responsible for the acquisition of language technology for the military. For more information about this project contact Dr. Bill Ogden at ogden@nmsu.edu

The NMSU RESEARCH NEWS is published by the Office of Vice President for Research, Graduate Studies, and International Programs. Comments are always appreciated. You can submit NMSU research news items online at:

<http://research.nmsu.edu/news>

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