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Western Center for Agricultural Health and Safety • University of California, Davis

WCAHS awards research funding for three top seed grant proposals

After careful review by an independent team of scientific researchers, agreement was reached to fund three seed grant proposals for the year 2012-2013. The seed grant projects and their recipients are:

PROJECT: Respirator training module for pesticide handlers and applicators

AWARDEES: Joyce Strand, PI, and Lisa Blecker, MS, Academic Coordinator, UC IPM - West Campus



Lisa Blecker

The University of California Statewide Integrated Pest Management (UC IPM) program proposes to develop a 120-minute, hands-on respirator training module designed for pesticide applicators and handlers. UC IPM will pilot the training in English and in Spanish, and will make modification to the module based on the results of the pilot trainings. After piloting the respirator training module, UC IPM will pursue extramural grant funding to develop the subsequent training modules.

PROJECT: Immune-mediated mechanisms of agricultural particle-induced lung inflammation and injury

AWARDEES: Kent Pinkerton, PI, and Alexa Pham, MS, Graduate Group in Immunology

The objective of this study is to characterize the immunological effects of the respiratory system with exposure to agricultural particles that may be



Alexa Pham

exacerbated by endotoxins or to tobacco smoke. Pathological changes in the lung, such as changes in the airway epithelium, mucous production and oxidative stress will be determined by immunohistochemical staining of sectioned lung tissues. In this study, investigators aim to determine the effects of exposure to these particles on the immune response of the respiratory system and the exacerbation of such conditions by endotoxin contamination or subsequent exposure to smoke.

PROJECT: Development and field evaluation of summer garments for California agricultural workers

AWARDEES: Co-PIs Gang Sun, UC Davis professor of textiles and clothing, and Uwe Reischel, professor of community & environmental health, Boise State, Idaho

Heat stress continues to be a significant health and safety problem for agricultural workers.

Exposure to solar heat radiation and metabolic heat buildup inside their protective clothing can result in heat exhaustion and heat stroke. To address this agricultural health and safety problem, investigators have conducted some preliminary



Uwe Reischel

studies on structures and properties that could reduce heat stress to wearers. Laboratory tests have shown that the garment reduces solar heat radiation effects by 60 percent while imposing no measurable metabolic heat gain. Based on results, prototype garments will be developed that are capable of limiting metabolic heat build-up inside protective clothing and mitigating heating effects of solar infrared radiation. A focus group study will be conducted to determine the suitability of the garments to farm workers.

You're invited to attend a special lecture and ceremony honoring Don Villarejo, founding director of California Institute for Rural Studies



John Howard, M.D., NIOSH director, will present "Passionate Partners Are What Makes Government Work (at all)."

Monday, December 10, 2012
5:00–6:30 p.m.

Genome and Biomedical Sciences Auditorium
451 Health Sciences Drive

RSVP by November 16
530-752-4050, or agcenter@ucdavis.edu

Castaneda studies of the effects of PM on asthma patients

By Carina Segoviano Perez,
undergraduate research
assistant, WCAHS

Do urban, rural particulate matter (PM) and/or agricultural dusts enhance the allergic effects on asthma patients? That's the question immunology graduate student Alejandro (Alex) Castaneda, under the direction of Professor Kent Pinkerton, is trying to answer to further understand the relationship between particulate matter (PM) and health effects.

His research is primarily focused on the effects of PM, alone, and within source mixtures on the allergic conditions in the lungs of mice. First, particulate matter was collected from agricultural, dairy, urban, and rural sites in the Sacramento and San Joaquin valleys. Among the study areas are Parlier, West Side, Fresno, Tulare, Sacramento, and Davis. Using the murine intranasal sensitization model and the amount of mucous present in the lungs, researchers are able to identify the degree of allergic airway inflammation after the mice have been exposed to the PM.

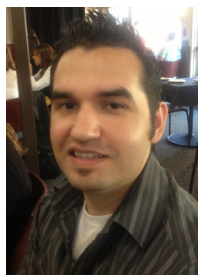
Alex explained that, "Mice were administered a common allergen, and a dose of allergen combined with PM. Results show there is a greater

inflammation in the lungs of mice when the allergen is combined with PM, versus the allergen alone." Interestingly enough, there is evidence of an approximate two-week lag period between the time the mice were exposed to the PM and when they began to see the effects. Current hypotheses suggest that there is something about the particulates that are priming the asthmatic-like condition. Additionally, the researchers' studies support recent literature revealing that PM seems to cause cell damage known as oxidative stress. Oxidative stress induces a series of factors that exacerbate the symptoms, in this case, inflammation of the lungs.

Additionally, Alex mentored Kelsey Green, a Granite Bay High School senior, through the UC Davis Young Scholars Program.

Their studies have concluded that agricultural activity has a greater effect on the lungs of mice, when compared to an urban setting, particularly due to the greater mucin secretions in the lungs, which indicates that agricultural dusts aggravate an asthmatic condition.

The results of this study will serve to raise awareness among the rural and urban communities regarding the types of PM that can affect health, how to minimize exposure to these PMs, and the precarious measures that would need to be taken for individuals who suffer asthmatic-like conditions.



Alex Castaneda



Alex mentored Kelsy Green (above), a Granite Bay High School senior

Alejandro hopes this project will serve as a baseline for future research, including the mechanism by which particulates are enhancing the asthma-like conditions, and to identify the source of the

particulate. The latter would be substantial information in order to efficiently implement air quality regulations and regulate emissions for the good of public health.

Highlights from WCAHS' retreat

On Friday, September 14, the WCAHS held its annual strategic planning retreat at the Sacramento offices of the California Endowment. The morning program included guest speakers, Ellen Widess, chief of CalOSHA, and

Sandra Schubert, under-secretary for the California Department of Food and Agriculture.

UC Davis Animal Science Professor and WCAHS Director of Research Frank

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From left, Chris Zanobini, Frank Mitloehner, Veronica Vargas, and Jay Schreider.

Mitloehner to chair U.N. committee on livestock emissions

WCAHS Director of Research Frank Mitloehner, a professor and air quality specialist at the University of California, Davis, was selected to chair a United Nations Food and Agricultural Organization committee to measure and assess the environmental impacts of the livestock industry.

During the first of his three-year appointment, Mitloehner will lead representatives of national governments, livestock industries, nonprofit and private sectors in establishing science-based methods to quantify livestock's carbon footprint, create a database of greenhouse gas emission

factors for animal feed, and develop a methodology to measure other environmental pressures, such as water consumption and nutrient loss.

Currently, many different methods are being used to measure and assess the environmental impacts of raising animals, making it difficult to compare results and set priorities for improvements. "By the end of three years, we'll have a methodology that's globally accepted, that anyone in the world can use to quantify the environmental impact of their livestock," Mitloehner said.

The Food and Agriculture Organization estimates that meat consumption is projected to increase nearly 73 percent by 2050, and dairy consumption will grow 58 percent over current levels.

These numbers highlight a need to create sustainable forms of food production.

Mitloehner's research has found that, in the United States, raising livestock accounts for 3.4 percent of greenhouse gas emissions nationwide, while the nation's transportation sector contributes roughly 26 percent.

"Transportation choices continue to be the main contribution to climate change and not, as is often depicted, food choices," Mitloehner said. "This new program is an effort to harmonize methodologies to benchmark the environmental impact of livestock."

For more information, contact Frank Mitloehner at fmmmitloehner@ucdavis.edu.



Air quality specialist Frank Mitloehner

WCAHS Retreat *continued from page 2*

Mitloehner facilitated a discussion panel titled "Private-Public Collaborations," which included Chris Zanobini, president and CEO of Agriculture Association Management Services in Sacramento; Veronica Vargas, project coordinator for Reiter Affiliated Companies (RAC), Oxnard; and Jay Schreider, Ph.D., CalEPA, and WCAHS Steering Committee member.

After lunch, UC Berkeley Professor Xochitl Castaneda, director of the Health Initiatives of the Americas (HIA) and WCAHS Steering Committee member,

provided an overview and update of her work in developing a Farmer/Farmworker Health and Safety Resource Guide and website. She was followed by Maria Guadalupe Figueroa, HIA graduate intern, San Jose State University, who presented her outreach research paper.

The afternoon session included breakout groups and a discussion panel facilitated by Prof. Castaneda. Panel members included Martha Guzman-Aceves, deputy legislative secretary for environment, energy, water and agriculture; Mario Gutierrez, executive director of the Center for Con-

nected Health Policy; Suzanne Teran, UC Berkeley Labor and Occupational Health Program (LOHP) and CalOSHA Heat

Illness Prevention Campaign coordinator; and WCAHS Outreach & Education Specialist Teresa Andrews.



Retreat attendees Meredith Leigh Younghein, J.D., special assistant, CalEPA; and Paul Leigh, professor and WCAHS project investigator.



Director Kassim Al-Khatib, center, was introduced by Professor Fadi Fathallah (left) co-chair of the WCAHS Seminar Series, and speaks with Bill Krycia, WCAHS External Advisory Board chair.

October 1, 2012, began the WCAHS 2012-2013 monthly seminar series. Guest speaker, Professor Kassim Al-Khatib, director of the UC Integrated Pest Management (UC-IPM) Program, presented a talk, titled, "Putting California First: UC-IPM Delivering on the Promise."

Highlights of his informative talk included UC-IPM development within the UC system, its legislative history and PowerPoint slides beginning with "Pest Impacts," health-wise, economic, ecological, the risk of pest management strategies and benefits. His PowerPoint presentation can be viewed at the WCAHS homepage: <http://agcenter.ucdavis.edu/>. Link on right is titled Seminar Series Web/Podcast/Powerpoint.



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Join the AgHealth e-mail listserver

The Western Center for Agricultural Health and Safety's AgHealth e-mail discussion group is open to anyone interested in agricultural health and safety. We welcome and encourage participation by posting comments or questions about agricultural health and safety. Subscribe at the WCAHS homepage: <http://agcenter.ucdavis.edu>, click on "AgHealth email List."

Calendar

December 10

John Howard, M.D., NIOSH director, will present "Passionate Partners Are What Makes Government Work (at all)." Lecture and ceremony **honoring Don Villarejo**, founding director of CIRS, 5–6:30 p.m. at the GBSF Auditorium, 451 Health Sciences Drive; RSVP 530-752-4050 or e-mail agcenter@ucdavis.edu by November 16

January 14

Annual WCAHS Graduate Students

Presentations, 4–5 p.m., CHE - Old Davis Road (3rd gate on the left after crossing the RR tracks)

February 4

Martha Stiles, program director for the California AgraAbility Project, will discuss her work, 4–5 p.m., CHE - Old Davis Road (3rd gate on the left after crossing the RR tracks)

For upcoming 2012–2013 WCAHS Seminars, please visit <http://agcenter.ucdavis.edu>