

Center for Research on Occupational and Environmental Toxicology

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CROET's Applied Research Focuses on Oregon

The Dalles, Eugene, Corvallis, Dayton, Hood River, Lincoln City, Parkdale, Portland—these are the Oregon cities where CROET scientists have conducted applied research in the last two years. That research was conducted in the industry sectors of agriculture, nursery and manufacturing. The research was aimed at studying pesticide exposures and methods for preventing those exposures, health effects of pesticides, physiological and neurobehavioral changes during exposure to hot working conditions, validation of new training methods for respiratory protection and safety in nursery work.

Dr. Linda McCauley and CROET colleagues have been studying migrant workers and the farms where they work for the last five years. The research team has focused on the development of culturally appropriate and effective test methods to identify the effects of exposures to chemicals such as pesticides. The tests are translated into Spanish to better study Oregon's large migrant worker population from Mexico. Concern over home exposure of children, for example, led to the development of a Spanish-language videotape to inform workers of practices that can minimize tracking pesticides home from work. The effectiveness of this videotape is now being evaluated in migrant clinics in Oregon. This project has been renewed by the National Institutes of Health for five more years (see the new grant section), and a new grant evaluating educational methods for migrant workers has also been awarded to Dr. McCauley.

CROET joined with the Painters' District Council to develop a computerized training program that can be used to train employees on virtually any subject, including safety and health. The initial program on Respiratory Protection was supported by an Oregon OSHA training grant, which was pilot-tested with painters and drywall finishers. CROET's base funding was used to create a development environment, named cTRAIN, through which programmers can create new training programs. cTRAIN automatically structures training using effective

Applied Research (continued from page 1)

behavioral education principles such as feedback, reinforcement and repetition of missed information on the frequent quizzes. The program, which was developed in Dr. Kent Anger's laboratory, is now being used at a wholesale nursery in Dayton to evaluate its effectiveness with Latino workers from South America. Federal funding to extend this work has been received at CROET (see new grant section).

CROET's applied research is not confined to Oregon. Research funded by the federal government has been conducted by CROET research staff in Seattle, Sacramento, San Francisco, Fayetteville (NC), and Hinesville (GA) to study military veterans who may have been exposed to organophosphate nerve agents in the Gulf War. Possible effects of fuel exposures were studied using CROET neurobehavioral testing methods at six Air Force bases in the southeastern United States. In Iowa, CROET administered neurobehavioral and psychological tests to community residents exposed to hydrogen sulfide.

In a recent grant to CROET's Dr. McCauley, we are collaborating with the Oregon Health Division to create a database of accepted Workers' Compensation (WC) claims that includes medical-only claims that are often not filed and thus not found in Oregon's WC database (SAIF, Liberty Northwest and Paula are providing the data.) The goal is to identify trends and patterns that are not now apparent in the state system and then communicate back to insurers to feed into their loss control programs (NIOSH funding).

With the arrival of new CROET faculty member Dr. Bill Lambert, an epidemiologist who specializes in exposure assessment, CROET's applied research is poised to continue its growth and influence.

NEW ON CROETWEB.COM

- Cell Phone Safety
- MSDS Information (updated)
- Eye Injuries & Prevention (updated)
- Hearing Injuries & Prevention
- Check out the new OHSU-OSU-PNNG SuperFund site!

CROET HEALTH AND SAFETY SEMINARS

Building Effective Training Programs

September 27-28, 2001

Stress in the Workplace

Challenges for the 21st Century

Co-sponsored by Portland State University
October 26, 2001

Internet Sleuthing

Hands-on Internet information workshop
Limited to five students per class
Second Friday of each month, 1-3 p.m.

For information on how to apply, contact CROET at:

Phone: (503) 494-4273

FAX: (503) 494-4278

E-mail: croetweb@ohsu.edu

GRANTS

Below are grants received by CROET faculty and staff since our last newsletter. Amounts listed are received over the duration of the grants, which range from one to five years. Most grants also provide "indirect" costs to OHSU that support the research.

Faculty	Funding Agency	Title	Total Award
Allen, C.N.	NIH	Presynaptic mechanisms in the suprachiasmatic nucleus	1,203,767
Anger, W.K.	NIOSH	Effectiveness of computer-based training: cTRAIN	1,058,036
Banker, G.A.	NIH	Gene expression profiling of neural cells in culture	453,000
Gold, B.G.	Kosan	Testing Kosan compounds for nerve regeneration	15,447
McCauley, L.	NIOSH	Pesticide training of adolescent migrant farmworkers	453,000
McCauley, L.	NIH/NIEHS	Reducing pesticide exposure in minority families	1,938,447
Patton, B.	OHSU SOM Res Com	CROET confocal microscope	15,000
Shyng, S.L.	NIH	ATP-sensitive potassium channels and insulin secretion	1,004,152
Yates, P.	American Cancer Society	Can altered methyl-binding protein levels cause aberrant gene silencing?	81,000

Molds in Our Indoor Environment

Summer is almost over, and just when you thought your pollen allergy woes would soon be over, the itchy eyes, runny nose and sneezing return. If this sounds familiar, you could be one of the unlucky people who are sensitive to airborne molds. Indoor exposure to molds is gaining recognition as an important risk factor for a variety of illnesses with public health implications. Fungal mycelia, spores, mycotoxins and volatile organic products of fungal metabolism are all suspect in a range of maladies — from respiratory irritation, skin rashes, respiratory allergies and asthma, to headaches, neurological problems and cancer.

Factors controlling mold growth

Molds are very common in buildings and homes, and will readily grow if provided the proper surface, food source and moisture conditions. *Penicillium*, *Aspergillus*, *Cladosporium* and *Alternaria* species are among the most common encountered, but a long list of fungal genera may colonize the indoor environment if given an appropriate substrate. Wood, linoleum, gypsum, mineral fiber, wallpaper, plaster and other common building materials are potential foods. Molds can also grow on dust and dirt in the ductwork, humidifiers, air washers and porous insulation components of poorly maintained heating, ventilation and air conditioning systems.

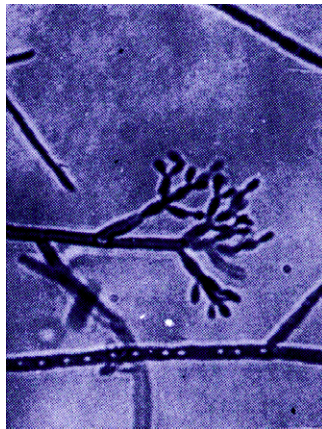
Although molds are capable of remaining metabolically active over a broad temperature range, they generally will not grow unless the substrate moisture content is greater than 15 percent and relative humidity levels are between 70 and 90 percent. These conditions are most prevalent during fall, winter and spring in the Pacific Northwest, and may be enhanced as a consequence of energy conservation measures. A common scenario is for indoor mold problems to arise after repeated flooding or to be associated with pools of stagnant water in mechanical systems.

Health effects of mold exposure

The Toxicology Information Center (TIC) at CROET receives several inquiries each year regarding adverse health effects related to breathing indoor mold products. The most commonly reported ailments are those with a clear link to the inhalation of mold mycelia and spores. These are respiratory irritation, allergic rhinitis and asthma. Other deleterious effects, however, have also been reported to the TIC. These include flu-like symptoms and neurological problems such as headaches, vertigo and loss of short-term memory. These latter health effects, at present, share a tenuous link with the presence of molds, but might result from nonallergenic fungal metabolites, including mycotoxins and volatile organic compounds.

Recent studies have focused on the danger to agricultural workers in indoor environments that contain mycotoxins on airborne dust particles. These studies primarily address aflatoxins, because of their potential to cause cancer. Aflatoxins have been measured at significant

levels on corn dust in grain elevators and processing plants, and in peanut and linseed oil-processing plant dust. Moreover, epidemiologists have found a positive association between exposure to airborne aflatoxins and cancer of the lung and colon in agricultural workers.



Another issue of importance in the workplace involves indoor air quality problems of buildings, known collectively as “Sick Building Syndrome”. The symptoms in people include headaches, itchy eyes, rashes and a variety of respiratory ailments. Although these effects are known to be produced by molds, they have long been blamed on a variety of other causes, including volatile chemical emissions from particleboard partitions, paints, carpets and cleaning supplies. Molds are also known to release volatile organic compounds (VOC) as a byproduct of their metabolism. Many of these VOCs are responsible for the “musty or mildewy” odors commonly associated with fungal growth. At least 22 volatile components have been measured, including 2-octen-3-ol, hexane, methylene chloride, benzene and acetone. Some of these are the same compounds found in many solvent-based building materials and cleaning supplies. This finding has raised the suggestion by some that manufacturers may be taking unnecessary blame for VOC emissions that are actually coming from molds rather than the building products they produce. Clearly, more research into the health effects of the metabolic products of indoor molds is needed.

Managing indoor mold problems

In most cases, molds can be removed by thoroughly cleaning contaminated surfaces with a solution of bleach and water (ten parts water to one part bleach). However, extensively contaminated areas — or molds growing in poorly ventilated areas — should be handled by a professional with experience in removing molds from buildings and homes. Attempting to clean heavy fungal infestations without proper equipment may actually increase the airborne levels of spores and mycotoxins, causing further contamination and increasing the health risk.

The best defense against the problem of indoor mold growth is prevention. Homes and buildings should be regularly inspected for evidence of water damage and mold growth as a part of routine maintenance procedures. High humidity environments such as poorly ventilated bathrooms and kitchens, as well as improperly drained basements, crawlspaces and exterior foundations, are likely locations for mold growth to occur. Any water leaks, condensation, infiltration or flooding should be corrected.

For more information on molds and air quality in the indoor environment, contact CROET’s Toxicology Information Center at 1-800-457-8627.

2001 CALENDAR: UPCOMING CONFERENCES

Send calendar notices to alishul@ohsu.edu or FAX to (503) 494-4278

Inter-noise 2001
The Hague, The Netherlands
August 27-30, 2001

E-mail: secretary@internoise2001.tudelft.nl

222nd American Chemical Society (ACS) National Exposition
Chicago, Illinois, USA
August 27-29, 2001

E-mail: expo@acs.org

EBEA 2001: Fifth International Congress of
the European BioElectromagnetics Association (EBEA)
Helsinki, Finland
September 6-8, 2001

Phone: +358-9-5840 9364

Fax: +358-9-5840 9555

E-mail: kati.kosonen@congreszon.fi

Children's Environmental Health II:
A Global Forum for Action
Washington, DC, USA
September 8-11, 2001

Phone: (613) 798-8029

Fax: (613) 798-2422

E-mail: scall@magma.ca

Web: <http://www.cich.ca>

Third International Symposium on
Silica, Silicosis, Cancer and Other Diseases
Genoa, Italy
September 8-13, 2001

Phone: +39 1 5737534 or 573513

Fax: +39 10 5737514 or 5737534

E-mail: ssosb@ist.unige.it

Web: <http://www.gwumc.edu/sphhs/occenv/bullet/symp1.htm>

Essentials of Risk Assessment
Arlington, Virginia, USA
September 10-11, 2001

Phone: (301) 657-0825

Fax: (301) 657-8299

E-mail: eeicorporation@cs.com

Web: <http://www.eeicorp.com>

Innovative Strategies in Managing Shiftwork:
15th International Symposium on Night and Shiftwork
Hayama, Japan
September 10-13, 2001

Phone: +81 44 977 2121

Fax: +81 44 976 8659

E-mail: jim@isl.or.jp

Web: <http://www.isl.or.jp/symp2001.htm>

Full Spectrum of Ergonomics: From Theory to Practice
New York, USA
September 13-15, 2001

Phone: (212) 255-6690

E-mail: dg28@nyu.edu

Hazard Studies: Techniques and How to Lead Them
Humberside, United Kingdom
September 17-21, 2001

Phone: +44 (0) 1642 372060

Fax: +44 (0) 1642 372188

E-mail: pauline.marwood@eutech.com

The Fourth International Scientific Conference on Prevention of
Work-Related Musculoskeletal Disorders (PREMUS 2001)
Amsterdam, The Netherlands
September 30 - October 4, 2001

<http://www.eur.nl/fgg/mgz/premus/>

2001 Meeting of the Society for
Chemical Hazard Communication (SCHC)
Arlington, Virginia, USA
October 2-3, 2001

Phone: (703) 658-9246

Fax: (703) 658-9247

B.C. Industrial Expo 2001/Safety at Work Trade Shows
Vancouver, British Columbia, Canada
October 3-4, 2001

Phone: (416) 398-2786 or 1-888-253-1718

Fax: (416) 398-7105

E-mail: contact@exposition.com

Web: <http://www.exposition.com>

Center for Research on Occupational and Environmental Toxicology

CROET, the Center for Research on Occupational and Environmental Toxicology at Oregon Health & Science University, conducts research, provides consultations and offers information on hazardous chemicals and their health effects. CROET includes more than 80 scientists and research staff exploring a range of questions relating to health and the prevention of injury and disease in the workforce of Oregon and beyond. CROET's Toxicology Information Center is open to the public and is staffed to answer Oregonians' questions about chemical and other occupational exposures. CROET's website also provides answers to questions about industry found in Oregon through links on a series of pages devoted to industry-specific topics.

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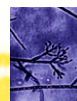
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Mechanized replanting
of nursery stock



Photomicrograph of
a conidiophore



KUDOS

CROET Adopts a Family for Christmas

When CROET director Peter Spencer made the pitch to help a family in need for the holiday season, special projects coordinator Rob Oppedisano stepped up to the plate in major-league style. After applying to the Society of St. Vincent de Paul, Rob was given the name of a disadvantaged single mother and her two young daughters. It was up to Rob to determine — then attempt to fulfill — their needs.

Having suddenly found themselves without a place to live for the holidays, the family's big wish was to have their own home for Christmas. Rob worked with prospective landlords to find suitable housing. This developed into an enormous task, which involved locating funds for a deposit (achieved with help from Rob's sister

and mother), pushing to get paperwork and inspections completed before Christmas, transporting mother and children to required appointments and numerous other tasks.

While efforts to secure housing were in progress, Rob also solicited donations of clothing, food and money from CROET staff, and with the help of Rodger Metheny, purchased additional food and clothing that the family would need. Rob's hard work paid off. The family was able to move into their own apartment with all the things they would need to start the New Year. Thank you to Rob Oppedisano and to all those who contributed to this worthy project.

FROM THE CDC

New CDC Chemical Exposure Report

The Centers for Disease Control and Prevention (CDC) has released its first National Report on Human Exposure to Environmental Chemicals. The new report is from a 1999 survey of 27 environmental chemicals that were measured in blood and urine from participants in CDC's National Health and Nutrition Examination Survey (NHANES), an ongoing national health survey of the U.S. population. Four categories of chemicals were measured: metals, pesticide metabolites, phthalate metabolites and cotinine, which is a metabolite of nicotine in tobacco smoke. This is the first time that national exposure levels are known for 24 of the 27 chemicals. Previously, the CDC assessed exposure of the U.S. population to only three substances — lead, cadmium, and cotinine. Future studies will include other substances in addition to the original 27, based on data obtained from samples collected in subsequent NHANES surveys. Eventually, the CDC plans to monitor as many as 100 chemicals. The latest study found that serum cotinine levels have decreased more than 75 percent in nonsmokers, signalling a dramatic reduction in the exposure of the

U.S. population to environmental tobacco smoke since 1991. Environmental tobacco smoke still remains a major public health concern, however, because more than half of American youth continue to be exposed to this known human carcinogen. Another positive finding is that blood lead levels continue to decline among children. CDC has been measuring the population's exposure to lead since 1976 through the NHANES surveys. Although this news is good, other data show that children living in environments that place children at high risk for lead exposure remains a major public health concern. CDC will monitor trends over time that may help scientists better understand the impact of the environmental chemicals on our health. Information on environmental chemical exposures will assist clinicians and public health officials in better understanding the relationship between hazardous exposures and health consequences, and guide public health prevention efforts. In addition, CDC will expand the report to include exposure data from studies of people exposed from localized or point-source exposures. For more information on the report data, log onto www.cdc.gov/nceh/dls/report.

Oregon Health & Science
University includes the
Schools of Dentistry,
Medicine and Nursing;
OHSU Hospital; Doernbecher
Children's Hospital; dozens
of primary care and specialty
clinics; multiple research
institutes; and several
outreach and public service
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