

CROET

Putting science to work for working Oregonians



CROET
2001
ANNUAL
REPORT

Mission, Purpose, and Mandate

CROET, the Center for Research on Occupational and Environmental Toxicology at OHSU, is dedicated to the promotion of health and safety in the workforce. Through basic and applied research, education, and outreach, CROET seeks to prevent disease and disability among working Oregonians and their families, during their employment years and throughout retirement.

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Message from the Director

Dear Fellow Oregonians,

“CROET - Putting Science to Work for Working Oregonians!” Many will have heard this message broadcast over public radio in an effort to increase awareness among Oregonians of the treasure trove of talent and information available to Oregonians through CROET at OHSU. This simple message proved most effective as judged by the dramatic increase in use of our information-packed website, www.croetweb.com.

There are many other messages that CROET wishes to broadcast, but time and space are always limited. We have used this report to illustrate some of the basic mechanistic and applied workplace research initiatives that are underway at CROET. Brief study of our Financial Summary reveals the various research activities that are supported by workers' compensation funds and leveraged federal grant support. On average, a single Oregon dollar leverages four federal dollars for basic and applied research at CROET! This speaks to the quality of CROET's scientists and staff in competing successfully for highly competitive research dollars from federal agencies such as the National Institutes of Health (NIH).

An example of this success, and a highlight of 2001, is the award to CROET of a multimillion dollar NIH center grant on toxicogenomics. This is a leading-edge methodology to measure and assess the impact of occupational, environmental, and other factors on gene and protein expression, the fundamental machinery of life, health, and disease. The new center grant positions OHSU in a prestigious national consortium of six leading institutions to develop gold-standard practices that promise to provide powerful new methods to assess risk for those exposed to hazardous substances.

Basic and applied research at CROET is complemented by a vigorous program of education, outreach, and community service regionally, nationally, and internationally. Added in recent years, and expanded in 2001, is a fee-for-service Chemical Risk Information Service that helps Oregon businesses provide federally mandated information to their employees. We will continue to seek such opportunities to expand our positive impact on the Oregon workforce through the use of creative, cost-effective initiatives that pay handsome dividends in worker health and safety.

Respectively submitted,

A handwritten signature in black ink, appearing to read "Peter S. Spencer", is written over a dashed horizontal line.

Peter S. Spencer, PhD, FRCPath
CROET Director and Senior Scientist

CROET

A Resource for Oregon

CROET conducts research on the basic biology of workplace-related injury and disease as well as research related to workplace performance and occupational exposure. CROET also participates in doctoral and postdoctoral educational programs to train the next generation of scientists and provides updates for health and safety specialists to ensure that the latest scientific advances are translated into enhanced workplace safety. Finally, through its outreach efforts, CROET serves as an information conduit to Oregon workers, employers, labor, and the general public.

Applied research is focused on workplace hazards, often spurred by specific safety issues of immediate concern to Oregon's workers. Research is focused on surveillance of workplace and environmental problems and prevention-related research focused on agriculture, service industries, and construction. This research has short-term payoffs. Examples: (1) Based on a legislative request, CROET evaluated risks of exposure to viral hepatitis in public health workers; (2) Computer-based education is being developed for respirator safety, pesticide exposures, ergonomics, and food services; (3) Agricultural workers are monitored for exposure to pesticides and adverse nervous system health effects, and are given safety training.

Basic research is focused on nerve damage and repair, and DNA damage and cancer. This research requires a long-term commitment and synergy among investigators, and has a long-term payoff. It is applicable to many diseases and disorders, including those associated with the workplace and those that arise from other causes (e.g., genetic, environmental). While this is important for Oregonians, it obviously has wider impact. Thus, most of the funding for CROET's research in these areas is supported by grants from the National Institutes of Health and from other federal sources. Examples: CROET scientists are studying (1) How nerves grow, how they connect (form synapses) with other nerve cells and with muscles, and how to enhance their regenerative potential — all of which are critical to post-injury recovery; (2) How environmental exposures trigger DNA damage and cancer, and how mutations in specific genes disrupt cell function.

Core research facilities In order to support the work of faculty scientists and ensure that CROET takes advantage of contemporary technologies, CROET maintains several shared-use facilities. Examples: (1) Toxicogenomics (application of the human genome project to environmental safety); (2) National Center for Nanobiotechnology (exploring the biomedical application of electronics industry techniques for mass fabrication of very small structures — for neural prostheses or tissue engineering).

Education Teaching the next generation of research scientists in neuroscience, integrated biomedical sciences, cell biology, and toxicology. Updating industry, labor, and government health and safety specialists on topics (e.g., workplace stress, developing effective training). Improving worker training through computer-based training.

Outreach CROET is an information conduit — using our expertise to help provide information to workers and employers that they might have difficulty obtaining or interpreting on their own. Teaching the difference between “junk” science and real science. The Toxicology Information Center provides a help line, and CROETweb.com provides a resource directory for Safety and Health focused on Oregon occupations and industry.

Community service Serving on Oregon government boards and working with minority groups. Examples: (1) Air Toxics and (2) Water Quality boards for Oregon's Department of Environmental Quality; (3) Oregon's Interagency Hazard Communication Council; (4) Pesticide Analytical and Research Committee; (5) Yakima Indian Nation.

Synergy Together, these resources can tackle any of the broad range of issues facing working Oregonians and the institutions supporting them. CROET has and continues to respond to requests from the Oregon legislature, government, industry, labor — and the working people of Oregon.

CROET Advisory Committee to OHSU's President

Bill Baird, PhD, *Oregon State University*
Hon. Alan Bates, DO, *Oregon State Representative*
Jim Craven, *American Electronics Association*
John Kirkpatrick, *Painters District Council*
Hon. Jerry Krummel, *Oregon State Representative*
Hon. David Nelson, *Oregon State Senator*
Meg Reinhold, *Department of Consumer & Business Services*
Marilyn Schuster, *Oregon OSHA*
Hon. Frank Shields, *Oregon State Senator*
Bob Shiprack, *Oregon Building Trades*
Sheldon Wagner, MD, *Oregon State University*

Superfund Basic Research Center (SBRC)

Peter Spencer, PhD, FRCPath (Principal Investigator), *Oregon Health & Science University*
Michael Gargas, PhD, *Sapphire Group, Dayton, OH*
Perry McCarty, PhD, *Stanford University*
Marlys Pierson, *Oregon Health & Science University*

[Neuro]toxicogenomics and Child Health Research Center

Peter Spencer, PhD, FRCPath (Principal Investigator), *Oregon Health & Science University*
Gary Banker, PhD, *Oregon Health & Science University*
Linda McCauley, RN, PhD, *Oregon Health & Science University*
John Pintar, PhD, *Robert Wood Johnson School of Medicine, Piscataway, NJ*
Brian Popko, PhD, *University of North Carolina (Chapel Hill) Neurosciences Center, Chapel Hill, NC*
Gary Rischitelli, MD, JD, MPH, FACOEM, *Oregon Health & Science University*
Susan Tolle, MD, *Oregon Health & Science University*
Mitchell Turker, PhD, *Oregon Health & Science University*

Community-Based Research Project: Reducing Pesticide Exposure in Minority Families

Oregon Health & Science University
Linda McCauley, RN, PhD (Principal Investigator)
Kent Anger, PhD
Bill Lambert, PhD
Michael Lasarev, MS
Juan Muñiz, MS
Marie Napolitano, RN, PhD, FNP
Diane Rohlman, PhD
Joan Rothlein, PhD
Oregon Childhood Development Coalition, Wilsonville, OR
Rachelle Mann-Gaytan
Jacki Phillips
Juanita Santana (Director)
Steve Aquafresca, *Hood River Growers and Shippers, Hood River, OR*
Jennifer Euwer, *Euwer Orchards, Hood River, OR*
Jeffrey Jenkins, PhD, *Oregon State University, Corvallis, OR*
Raul Maquez, *Farmworker, Hood River, OR*
Deborah Profant, PhD, *Environmental and Occupational Epidemiology, Oregon Department of Human Services, Portland, OR*
Lorena Sprager, *La Clinica del Carino, Hood River, OR*
Dan Sudakin, MD, *Oregon State University, Corvallis, OR*

Multidisciplinary Training in Neuroscience (Steering Committee)

Gary Banker, PhD (Principal Investigator), *CROET, Oregon Health & Science University*
Michael Andresen, PhD, *Physiology and Pharmacology, Oregon Health & Science University*
Chris Cunningham, PhD, *Behavioral Neuroscience, Oregon Health & Science University*
Fay Horak, PhD, *Neurological Sciences Institute, Oregon Health & Science University*
Edwin McCleskey, PhD, *Vollum Institute, Oregon Health & Science University*
Laurence Trussell, PhD, *Oregon Hearing Research Center, Oregon Health & Science University*

CROET's

Areas of Emphasis

Education and Outreach Programs

CROET's Education and Outreach Programs have four goals:

- Provide scientifically accurate information on Oregon's occupational issues, continuously on the Internet and daily with scientific interpretation for complex issues through its Toxicology Information Center (TIC).
- Offer educational programs on Oregon's occupational needs to medical providers and health and safety specialists.
- Train health professionals who will investigate Oregon's occupational health and safety issues in the future.
- Provide the scientific expertise to help Oregon industry and labor evaluate occupational health and safety questions.

Research

Factors that affect workplace performance

- Cellular mechanisms that control sleep:wake cycles
- Job performance in shift workers
- Computer-based training methods to enhance worker safety training (e.g., ergonomics, respirator use)
- Ion channel disorders that underlie diabetes and nerve cell dysfunction

Damage and repair (e.g., post injury) of the nervous system

- Assessing nerve cell protein dynamics using imaging
- Using nanotechnology to enhance nerve growth
- Factors that govern the accuracy of nerve synapse formation
- Pharmacological interventions to enhance nerve regeneration
- Genetic models of neural degeneration

Occupational/environmental exposures and their consequences

- Effects of pesticide exposures assessed using exposure biomarkers and neurobehavioral testing
- Effects of solvent exposures on aircraft maintenance workers
- Toxicant exposures in Gulf War veterans
- Environmental toxins that disrupt protein transport in neurons
- Airborne pollutants

DNA damage, genetic alterations and disease

- Role of DNA repair in protecting the nervous system from genotoxin effects
- Gene silencing and cancer
- Mutations induced by ionizing irradiation, oxidative stress, and other genotoxins

Selected 2001 Accomplishments

- CROET awarded one of five national [Neuro]toxicogenomic and Child Health Research Centers
- Web page redesigned to reduce loading time by two-thirds; hits increased 15 percent in 2001
- SuperFund Basic Research Center produces practical solutions (e.g., speeding solvent degradation in soil)
- Research reveals occupational contribution to hepatitis seroprevalence is low
- Demonstration database system speeds access to training record documentation and adds 24/7 availability
- Research delving into non-time-loss injury trends in Oregon
- CROET's computer-based training program awarded grants; collaboration expanded
- Research demonstrates protein plays key role in targeting regenerating neurons to proper locus
- Community-based research program gains broad support, including growers, farmworkers (advisory committee)
- CROET scientist leads neurosciences training program (advisory committee)
- Chemical Risk Information Service expands in accord with need

2001 CROET Highlights

Toxicology Information Center: Responding to Oregonians' Questions

CROET'S Toxicology Information Center (TIC) is a special purpose library with holdings relevant to the mission of CROET, its scientists and staff, and with access to the world's electronic resources on the Internet. The TIC's printed collection is centered on current publications in industrial, occupational, environmental, and epidemiological research, as well as a core group of basic science journals selected by CROET faculty and staff. Among the TIC resources are special collections of information about occupational and environmental issues assembled from a wide variety of scientific literature, governmental reports, and Internet resources (reviewed). Under the directorship of Fred Berman, DVM, PhD, the TIC is a valuable public information resource, as demonstrated by an ever-increasing number of inquiries from people concerned about the risks of exposure to chemicals encountered in the workplace or home environment. Most inquiries come via telephone, but an increasing number of interested parties are contacting the TIC by email through the CROET website. The TIC is now offering a monthly Internet Sleuthing Workshop. This hands-on Internet information course is available in the TIC the second Friday of each month from 1-3 p.m. The resources of the TIC, including the use of several computers, are available to the public Monday through Friday from 8 a.m. until 5 p.m. (<http://www.croetweb.com>)

CROETweb: Visitors and Hits Continue to Grow

CROETweb, the Center's website, serves as a major source of occupational safety and health information for all working Oregonians. Designed as a resource directory, the website contains links to hundreds of resources for health and safety professionals. The website has pages dedicated to all major Oregon industries and occupations as well as a variety of safety and health topics. Oregon safety and health specialists visit CROETweb frequently. The most popular occupational safety and health pages in 2001 were semiconductors, restaurant and kitchen safety, artists, back injuries and prevention, and cell phones/EMF safety. New topics/web pages were added in 2001: bioterrorism, ergonomics, evaluating health-related websites, and shiftwork. In September, 2001, Holly Sherburne, MS, joined CROET as the new full-time Web Manager. Ms. Sherburne has a background in toxicology outreach and education, as well as extensive website design and coding experience. In 2001, the home page was revised, reducing loading time by two-thirds, and the update schedule was accelerated. Increasingly, websites from Oregon and around the world link to CROETweb. The number of "visitors" to the website increased to more than 12,000, and hits exceeded 100,000 (up over 15 percent from 2000). (<http://www.ohsu.edu/croet> or <http://www.croetweb.com>)

Chemical Risk Information Service: Helping Oregon Business

CROET's Chemical Risk Information Service is a 24/7 toxicological and risk information program designed to help business and industrial clients comply with the OSHA Hazard Communication standard. Directed by Greg Higgins, PhD, with Sundii Moser Gillespie, RN, BA, CSPI, as Program Manager, this program provides client employees and consumers a centralized source for round-the-clock access to Material Safety Data Sheets (MSDSs). Our Worker Right-to-Know Program helps employers give their employees access to MSDSs for the hazardous chemicals present in their workplace. We provide toll-free phone access to the program, and MSDSs are available via fax and through our website. Clients also have immediate access to advice from licensed health care professionals via the Oregon Poison Center. Our Product Stewardship program provides a toll-free number for clients to place on their product labels or packing information as a resource for customers who have safety questions concerning the product. This program offers a convenient way for companies to provide their customers with global access to product safety information and product MSDSs. Our client list of Oregon businesses served by the Chemical Risk Information Service continues to grow, and during 2001 we added eight new clients from the construction and high-tech industries. (<http://www.ohsu.edu/croet-cris/>)

Superfund Grant: Supports Worker Safety and Health

CROET's federally funded Superfund Basic Research Center continued its studies of toxic environmental chemicals important to working Oregonians. Scientists at CROET are investigating the neurotoxic effects of aromatic solvents, studying how chlorinated solvents can interact with DNA to cause mutations, and examining how exposure to trace levels of toxic chemicals can affect the early development and maturation of the brain. Collaborating scientists at Battelle are performing cutting-edge computational chemistry studies to characterize the interaction of aromatic solvents with nerve cells and studying how toxic chemicals are absorbed by the body and to what extent they reach particularly vulnerable organs such as the brain. Consortium partners at Oregon State University are pursuing a parallel line of research that investigates how chlorinated solvents behave once they enter the environment and contaminate groundwater. The work conducted by our Superfund Center will lead to a greater understanding of how toxic environmental chemicals can impact nearby residents and workers and will also develop improved cleanup methods. The CROET-led Superfund Center is directed by Peter Spencer, PhD, FRCPATH and Greg Higgins, PhD. (http://www.ohsu.edu/croet/sbrc/home_page.html)

Responding to State Requests: Hepatitis C and Public Safety Workers

Last year, CROET researchers prepared a literature review for the Oregon Legislature regarding the risks associated with Hepatitis B and C in police, fire, Emergency Medical Services, and correctional personnel. Because we found important gaps in the scientific literature regarding the prevalence of hepatitis among police, fire, and correctional officers, the Legislature asked CROET researchers to conduct a study to estimate the prevalence of, and risk factors for, Hepatitis C among public safety workers in Oregon. Testing was conducted in Spring, 2001, in Salem, Portland, Corvallis, Keizer, Independence, Monmouth, Dallas, Albany, McMinnville, and Newberg. Of the 719 public safety workers who volunteered to have their blood tested, 710 (98.8 percent) were negative and seven (1.0 percent) were positive. Thus, seroprevalence rates in Oregon are below that reported in the general population and lower than, or similar to, those published for other public safety officer populations. These data suggest that the occupational contribution to risk for hepatitis is small and that, in the absence of data demonstrating a significant association with occupational risk factors, non-occupational risk factors probably predominate. Nonetheless, employers and employees should continue to seek to reduce opportunities for exposure to blood and body fluids through the implementation of exposure control methods. (<http://www.ohsu.edu/croet/faculty/rischitelli/index.html>)

Collaborative Training Information Repository: A Practical Demonstration

CROET's Dr. Mitchell Altschuler worked closely with Portland's Painters District Council and their associated contractors to design a secure web-based database containing records of member training, medical evaluations, and respirator fit testing. The database, named the Collaborative Training Information Repository (cTIR), can be updated by the District Council and accessed by signatory contractors to confirm and document employee training. Updates trigger automatic recalculation of items such as current-year training hours, important for proper calculation of pay rates. Prior to the cTIR, contractors telephoned the District Council data specialist who reviewed records for the worker and mailed documentation to the contractor, adding personnel costs to the District Council and delays for the contractor. The cTIR Internet system allows the contractor to verify training records 24/7, and it eliminates the need for redundant training that was often repeated when records could not be obtained and time was of the essence. Both the District Council and construction contractors have praised the system. The design elements of this demonstration program are available and can be modified for any occupational specific issue. A generic demonstration is available on CROETweb for review, in 2002. (<http://www.ohsu.edu/croet/faculty/anger/index.html>)

Partnerships in Surveillance and Prevention: New Workers' Compensation Data

CROET scientists are engaged in a collaborative project with the Oregon Department of Health and Human Services and workers' compensation insurers in the state, which will demonstrate the value of working with insurers to

recognize injury trends and opportunities for prevention strategies. Currently, Oregon data on work-related injuries and illnesses are only reported for those injuries/illnesses that are serious enough to cause more than three days of work loss (defined as “time-loss” injuries). Private and public workers’ compensation (WC) insurers, however, maintain databases of all injuries, both time-loss and those in which employees return to work within three days (defined as “medical-only” cases). This project is testing the feasibility of merging WC claims data from multiple insurers into a common database that will provide information on differences in the disabling “time-loss” and “medical-only” claims among different insurers according to type of injury/illness, age and gender of claimants, type of industry and occupation. Comparisons will be made in the profile of occupational injury and illness available in state WC databases and the profile available in data from insurers. This project will demonstrate the utility of complete insurer databases in monitoring clusters of illness and injury, trends and patterns of claims, and identifying new intervention opportunities as they emerge. (<http://www.ohsu.edu/croet/faculty/mccauley/index.html>)

cTRAIN: Computerized Training Program Expands

CROET’s interactive training program to develop effective individual training methods for occupational safety and health continued to grow in 2001 with initiation of two new federal grants to CROET and an OR OSHA grant to the Painters and Drywall Finishers. cTRAIN was developed by CROET Associate Director Dr. Kent Anger in collaboration with Mr. John Kirkpatrick of the Painters District Council. In 2001, the basic principles underlying cTRAIN were examined to determine how frequently quizzes and feedback are needed for maximum recall and learner acceptance. A collaboration with Monrovia, a wholesale plant nursery in Dayton, Oregon, led to the development of new system training instructions (“how to use” cTRAIN) presented in Spanish that were effective for Latino migrant workers with limited education. Collaborations to create new content in cTRAIN were also developed with the Oregon Association of Nurserymen, a labor and industry consortium involving drywall finishers, and OHSU offices responsible for food handling and lab safety. (<http://www.ohsu.edu/croet/faculty/anger/index.html>)

What Muscles Tell Their Nerves: New Signal for Proper Synapse Function Found

Recovery from traumatic injury requires accurate, functional reconnection of nerves with their targets. Nerves do form synapses on appropriate targets during embryonic development, and these synapses contain microdomains called active zones, where the chemical neurotransmitter is secreted. At the neuromuscular junction, the large synapse between motor neuron and muscle fiber, multiple active zones are positioned very precisely across the synapse from the folds in the postsynaptic surface of the muscle cell. This arrangement has been preserved over several hundred million years of vertebrate evolution, showing the importance of carefully controlling the site of neurosecretion. Mice were genetically engineered to lack a muscle protein, causing their motor nerves to locate active zones randomly in the nerve terminal. The discovery that this protein is a key factor in guiding nerves to reconnect with the proper muscle area will guide efforts to improve recovery from neuromuscular injury. (<http://www.ohsu.edu/croet/faculty/patton/index.html>)

Risk Assessment for Multnomah County Divers: Addressing Local Concerns

On December 1, 2000, the Portland Harbor was listed as an EPA Superfund site because Willamette River sediments are contaminated with metals, pesticides, polychlorinated biphenyls, and petroleum products. Several months later, CROET researcher Joan Rothlein, PhD, was asked by the Multnomah County Sheriff’s Office to assist with an evaluation of potential occupational exposures to contaminants in the Portland Harbor among members of the department who dive and patrol in the Portland Harbor as part of their search and rescue activities. With the cooperation of Oregon Department of Environmental Quality (DEQ), EPA, and ATSDR, Dr. Rothlein and other CROET scientists are addressing the health and safety concerns of members of the Sheriff’s Office by: (1) Identifying microbial and chemical hazards in the water and sediment in the Portland Harbor and other dive locations from federal reports; (2) Evaluating personal protective equipment options; (3) Calculating possible human health risk using reported contaminant levels and information on the location and duration of each dive extracted from individual dive logs. (<http://www.ohsu.edu/croet/faculty/rothlein/index.html>)

Financial Summary

CROET Expenditures Fiscal Year 2000/2001

Workers' Compensation Expenditures		Federal and Other Grant Expenditures	
Salaries		Salaries	
Salaries - research (19% of all salaries)	\$797,106	Salaries - research (52% of all salaries)	\$2,182,243
Salaries - outreach (9% of all salaries)	394,405	Salaries - outreach	0
Salaries - education (5% of all salaries)	208,795	Salaries - education	0
Salaries - administration (10% of all salaries)	436,073	Salaries - administration (0.4% of all salaries)	17,983
Salaries - core services ¹ (3.3% of all salaries)	149,281	Salaries - core services (1.3% of all salaries)	54,350
Supporting Services (includes cores)		Supplies and Equipment	1,651,331
Supplies and equipment	581,990	(Laboratory supplies, animal costs, human subjects, equipment and other expenses)	
Miscellaneous support ²	150,056	Other Expenses	
Education and Outreach		Building operations & maintenance	513,192
Services, supplies and equipment	250,067		
Other Expenses			
Bond principal & interest	353,481		
OHSU administrative charges	122,508		
Total	\$3,443,762	Total	\$4,419,099

Programs Fiscal Year 2000/2001

	Amount paid by WC	Amount paid by Grants	Total Cost
Education and Outreach			
Information dissemination (e.g., TIC ³ , website, newsletters, brochures)	\$545,198	\$0	\$545,198
Education and training programs (professional and para-professional)	253,631	150,326	403,957
Chemical risk information service	54,438	0	54,438
Basic and Applied Research			
Factors that affect workplace performance	130,194	672,748	802,942
Damage and repair of the nervous system	232,431	858,022	1,090,453
Occupational/environmental exposures and their consequences	340,881	1,335,259	1,676,140
DNA damage, genetic alterations and cancer	177,091	802,054	979,145
Other ongoing projects ⁴	172,583	63,602	236,185
Core services support ¹	232,097	23,896	255,993
Non-program-specific expenses ⁵	1,305,218	513,192	1,818,410
Total Expenses	\$3,443,762	\$4,419,099	\$7,862,861

¹ Core services: centralized graphics, imaging, tissue culture and morphology (pathology)

² e.g., office supplies, equipment maintenance and repair, phone rental and line charges

³ Toxicology Information Center

⁴ Primarily legislative mandates (e.g., hepatitis research)

⁵ Includes supporting services, administrative salaries, bond principal and interest, and OHSU administrative charges

CROET

The Center for Research on Occupational and Environmental Toxicology (CROET) conducts research, trains health professionals, provides consultation, and offers the public information on hazardous chemicals and their health effects. CROET includes more than 85 scientists and research staff exploring a range of questions relating to the prevention of injury and disease — and the promotion of health — in the workforce of Oregon and beyond. CROET's Toxicology Information Center (TIC) is staffed to answer Oregonians' questions about chemical and other occupational exposures, and the Center's website makes health and safety information continuously available.

How to Contact Us

Mail Address

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3181 S.W. Sam Jackson Park Road, L606
Portland, Oregon 97239-3098

World Wide Web Address

www.ohsu.edu/croet or www.croetweb.com

Telephone

Main CROET number: 503-494-4273
Fax: 503-494-4278
Toxicology Information Center: 503-494-7366

E-Mail

General information
croetweb@ohsu.edu
Toxicology Information Center
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For additional copies of this report, call CROET at the numbers listed above, or visit www.ohsu.edu/croet and click on "contact CROET".

Directors and Scientific Staff, 2001

Director and Senior Scientist

Peter S. Spencer, PhD, FRCPATH

Associate Director and Senior Scientist

W. Kent Anger, PhD

Associate Director for Finance and Planning

J. Robert Williams, MBA

Assistant Director for Operations

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Mike Lasarev, MS
Elaine Mahoney, MS
Sarah Michaels, MS

Front Cover

Top Photo

Picture of a synapse between a neuron and a muscle (see highlight on guiding reattachment of damaged nerve to proper location on a muscle), featured on the cover of the highly regarded journal, Nature Neuroscience.

Middle Photo

CROET website home page.

Bottom Photo

Picture of CROET research assistant sampling a residence for pesticides in study of work and home practices that reduce pesticide levels returned to homes from work. See advisory committee for Community-Based Research Project: Reducing Pesticide Exposure in Minority Families.

Back Cover

CROET engages in research to identify and prevent illnesses and injuries in the workforce. Although we blaze a new trail, we are not the first to walk in these woods. For centuries, workers and physicians have sought to clarify the relationships between various exposures and disease. Listed on the back cover are descriptions of occupational disorders named by those afflicted or by their caregivers.

Scientific Staff continued...

Mykhaylo Moldavan, PhD
Juan Muñiz, MS
Cole Nelson, PhD
Anthony Oliva, PhD
Diane Rohlman, PhD
Joan Rothlein, PhD
Bernard Sampo, PhD
Jennifer Scherer, MPH
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