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Sitting ducks: Decoy cells may save lives

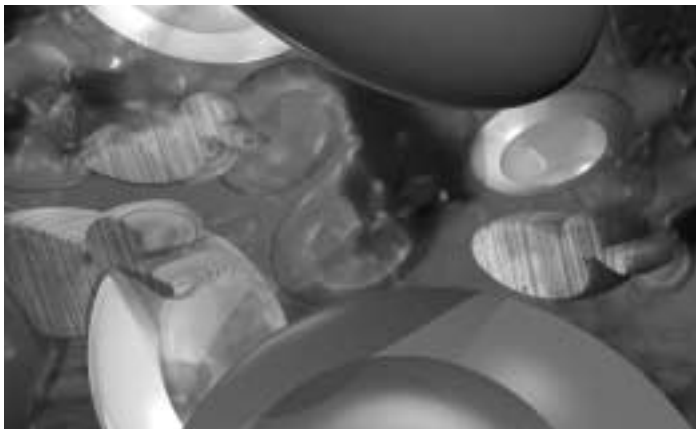
by Shelley Thompson

Scientists at the Laboratory are researching a new approach for neutralizing deadly toxins released by pathogenic bacteria, such as those that cause anthrax and plague.

The scientists' initial efforts focus on staphylococcus aureus, or staph, whose toxin is responsible for a variety of skin diseases, toxic shock syndrome and a quarter of all food poisoning cases in the United States each year.

The researchers have designed and laboratory-tested a decoy molecule, or receptor-mimicking molecule, that stops the spread of the bacteria's toxin by preferentially binding the toxin, keeping it from binding to the immune system's cells. This research may in time lead to methods for fighting virulence factors from harmful viruses, such as HIV that causes AIDS.

"The decoy molecules are better suited to protect the body's immune system from attack than currently used antibodies," said Goutam Gupta a structural biologist in



Bioscience (B-1) who led the research project. "Ideally, the decoys could offer a faster-acting, more effective alternative to stop the toxins. If all goes well with further research, the decoy could be given to patients suffering from food poisoning or toxic shock syndrome.

Staph bacteria attack the body and elicit effects by releasing a toxin designed to subvert the immune system. Typical treatment for a staph infection involves antibiotics, but staph is growing increasingly resistant to antibiotics. Lab researchers have taken a novel approach to blocking the staph toxin by building a decoy molecule that mimics the toxin's binding sites on antigen-presenting cells and

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Laboratory Director John Browne holds a mock up of the new Los Alamos National Laboratory Medal.
Photo by LeRoy N. Sanchez

New medal to represent highest Laboratory honor

by Chris Pearcy

Laboratory Director John Browne is seeking nominations for the new Los Alamos National Laboratory Medal award that will represent the highest honor the Lab can bestow on an individual or small group of three or fewer individuals.

Nominees for the award will be judged on the following criteria:

- a contribution that changed the course of science,
- a major enhancement of the Laboratory's ability to accomplish its mission,
- a significant impact on Laboratory sustainability and
- establishment of a major direction for the Laboratory and/or the nation.

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Thanks to all of you

At the end of April, the Department of Energy team verified that the Laboratory has made significant progress in Phase II implementation of Integrated Safety Management. Those working in the Dynamic Experimentation (DX) and Nuclear Materials Technology (NMT) divisions received the majority of the attention during the assessment. They represented the Laboratory in our best tradition and clearly demonstrated the progress we've made. In fact, all members of the Laboratory who interacted with the DOE team exemplified the principle of management commitment and worker involvement.

Now that we have completed the verification process, we move into the ISM continuous improvement phase. As in any process, there are always opportunities for improvement, and the DOE team identified three areas we need to target: feedback and improvement, trust between DOE and the Laboratory and the formality with which we conduct work. Each of these three is critical if we are to achieve the next ES&H goals I have set for us. Integral in the effort are management walkarounds — they demonstrate both management commitment and provide the feedback needed for employee involvement and process improvement. The Senior Management Team is committed to leading improvement efforts and the progress we have made in self assessments and quality assurance will be combined with those designed to simplify and enhance safe work practices and improvements in formality of operations to strengthen the ISM system.

Continuous improvement in both safety and security is our No. 1 institutional goal and the lessons learned from ISM also can be applied to our efforts in Integrated Safeguards and Security Management as we embark on the difficult task of achieving world-class performance in both ISM and ISSM. Thank you for your commitment and sustained performance.

Sitting duck …

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helper T cells. The staph toxin attaches to the decoy instead of the immune cells, preventing it from setting off its harmful chain of events.

Typically bacterial toxins or antigens — molecules that cause an immune response — are quickly targeted by the body's immune system and cleared by its antibodies. Specialized immune cells called antigen-presenting cells, which label foreign invaders for other cells to attack, engulf a toxin molecule and process it. This process activates other immune cells called helper T cells and a host of other immune cells, some that produce antibodies to inactivate the toxin.

The staph toxin, classified as a superantigen, does not follow the same cellular process. The superantigen bypasses the normal route of antigen processing by binding as an intact protein to the receptors on both the APC and the helper T cell. This binding over-stimulates the immune system causing T cell proliferation and a massive production of cytokines — chemical mediators released by cells that affect the behavior of other cells — resulting in cellular toxicity. This overstimulated immune response is ineffective at fighting the infection, turns the body against itself and can lead to shock and even death.

The researchers genetically engineered a decoy protein molecule consisting of the two sites on the immune cell receptors to which the staph toxin binds. "The resulting protein can be attached to the surface of a liposome — a fatty hollow sphere or vesicle — and given by injection, or orally. Because it does not contain the binding sites for normal antigens, it does not interfere with the normal immune function," says Gupta. "The beauty of these mimics is that they can be given in advance, if someone were worried about possible future exposure, and they will be cleared within three days without leaving any side-effects." Since it binds to the staph toxin with an affinity similar to that of the immune cell receptors, the decoy molecule will only have to be administered in concentrations comparable to that of the immune cell receptors. "The decoy molecules, with or without bound toxins, are cleared by the liver in about three days."

The research was funded by the U.S. Department of Energy and the Defense Advanced Research Project Agency, part of the U.S. Department of Defense.

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NNSA

NNSA adopts ISSM complex-wide

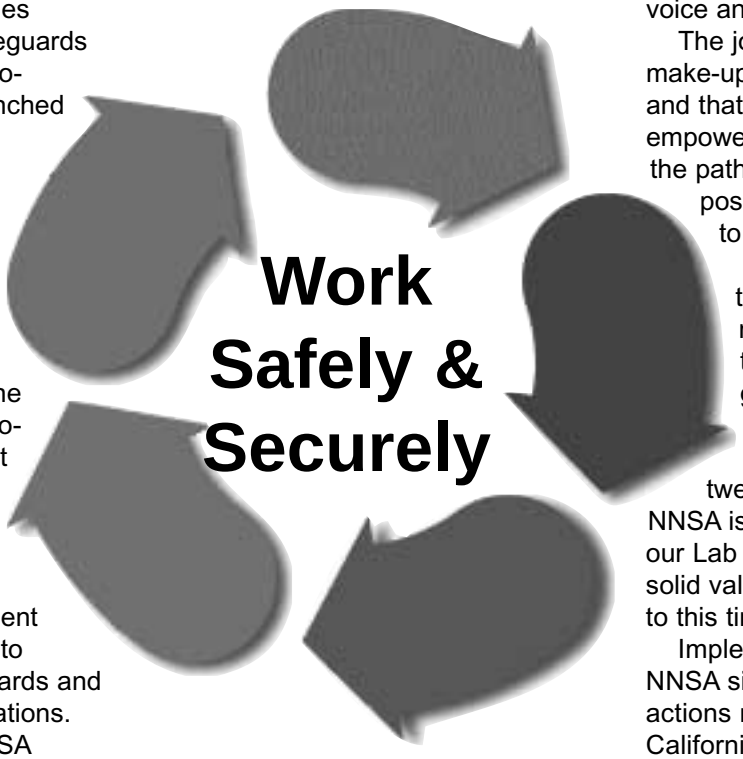
by Kevin Roark

The Department of Energy's National Nuclear Security Administration has directed that all NNSA facilities and laboratories implement an Integrated Safeguards and Security Management program, a program already launched at Los Alamos.

Gen. John Gordon, who leads NNSA, issued a pair of implementation memos to all NNSA federal and contractor employees in late March. The memos served to introduce the NNSA complex to ISSM and to outline the overall path forward, while promoting tailored approaches at each NNSA site.

"I recognize NNSA field offices and operating contractors possess intimate site knowledge on how to implement Department of Energy policy to achieve integration of safeguards and security into day-to-day operations. To fully implement ISSM, NNSA offices and contractors will develop site-specific approaches to ISSM," wrote Gordon in the second memo.

Gordon also wrote, "Once you learn more about ISSM, I'm sure that you will see it represents a sound approach to enhance security. We can make a difference if we take on this challenge and take control of our own issues and ideas."



The framework adopted by NNSA mirrors the ISSM program already under way at the Lab. "Gordon was briefed on ISSM early on and quickly supported it," said Carl Ostenak, ISSM program manager at Los Alamos. "He chartered a joint federal/contractor Safeguards and Security Management Integration Team to launch the initiative for all of NNSA, and we have had a strong voice and influence."

The joint federal/contractor SSMIT make-up was a positive step forward and that, combined with Gordon's empowerment of the team to develop the path forward, virtually ensured a positive outcome, according to Ostenak.

"The NNSA-wide guidance that emerged from the implementation team preserved the 5-step process and the guiding principles that are at the center of the Lab's ISSM program. With very few tweaks, the program adopted for NNSA is very similar to the direction our Lab already was heading. It's solid validation for all we've done up to this time," said Ostenak.

Implementation of ISSM for all NNSA sites closely resembles the actions required of University of California sites, required by Appendix O of the DOE's contract extension with UC. "Enhancing safeguards and security through ISSM is vital to our mission and Appendix O success," said Ostenak. "The first Appendix O ISSM milestone called for developing a communications plan by April 18. The Lab's plan is heavily focused on engaging the work force by promoting safeguards and security awareness and soliciting employee feedback, aimed at continually involving the security of day-to-day operations."

A "gap analysis" now is being conducted to determine shortcomings in current safeguards and security systems and to develop an action plan for closing the "gaps." Ostenak added, "Although our Lab's making great progress, there's much yet to accomplish to truly achieve 'worker-based security serving science and society.'"

Lab director announces …

continued from Page 1

Deadline for submitting a nomination is June 22. Nomination packets also must include three supported letters. Send nomination letters to John Browne in care of the Science and Technology Base Program Office, Mail Stop M714.

The medal may be awarded for a specific major accomplishment or a sustained, distinguished career. Recipients are not required to be Laboratory employees. The medal may be awarded to anyone who meets the selection criteria, except those currently serving in public office, to ensure that the award represents scientific achievement and not political favoritism. Award recipients must have, or have had, a strong affiliation with the Laboratory as an employee, retiree, affiliate or benefactor. The medal won't be awarded posthumously except under extraordinary circumstances, said Bill Press, deputy Laboratory director for science, technology and programs.

More information about the award and how to nominate a candidate is available in a May 8 all-employee memo from Browne.

Ombuds Office offers innovative service

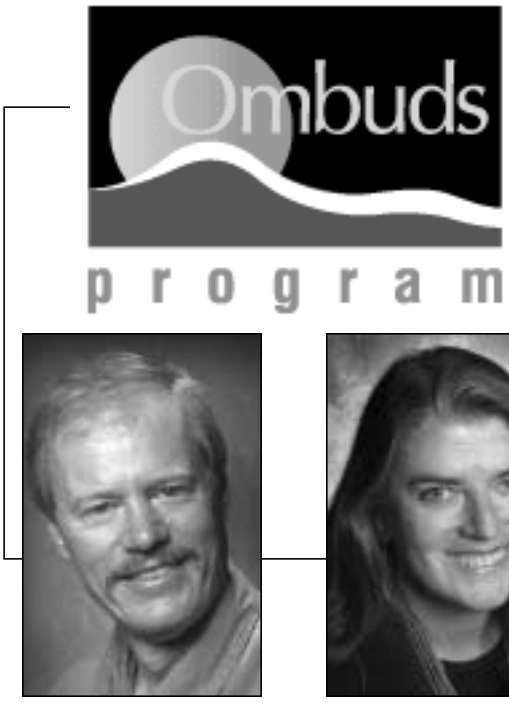
by Judy Goldie

The Lab is often thought of as being on the cutting edge of technology. It also is leading the nation in its ombuds programs.

Organizational assessment and conflict resolution — a means of "alternate dispute resolution" — is a way to identify systemic conflict. The Lab's program, designed by Lab Ombudsman Bruce MacAllister based on national standards and implemented by Lorrie Bonds Lopez, began as a pilot program. It filled a need at the Lab to get to the root cause, or causes, that impede efficient functioning of organizations — large or small. This pilot program has evolved, through client feedback and an increasing number of requests, to an established part of the Ombuds Program Office's services.

Organizational assessment and conflict resolution, figuring out how various aspects of any group work — or don't — is a relatively new area of ombuds practice, but one that is here to stay. Through organizational assessment and conflict resolution, a "broader net can be cast" to get to the very roots of conflict, said Lopez. Lopez was one of seven speakers on this subject at the national conference of the Ombuds Association earlier this month.

Not every issue an ombudsman encounters can be addressed in a one-on-one conversation, shuttle diplomacy or even small group discussions, said Lopez. Some conflicts involve a wide variety of people and issues, in a tangle that is difficult to unravel, she added.



Bruce MacAllister

Lorrie Bonds Lopez

The organizational assessment and conflict resolution approach focuses on the process within working divisions, groups and teams. No two assessments have the same process, interventions or outcomes, stressed Lopez. The organization involved maintains control of the process, just as individuals do in one-on-one ombuds counseling. The organization generates the information needed to identify conflict and impediments. The Ombuds Office facilitates group sessions, exercises designed to reveal what works and what does not and the processes needed to promote deeper understanding of group dynamics. Through this process, the organization reaches its own solutions.

The organizational assessment and conflict resolution method has been successful not only in resolving organizational conflict but in reducing the need for individual Ombuds Office services, Lopez noted.

A victim of its own success, the Ombuds Office basically created an unfunded mandate. With the growth in requests for the organizational assessment and conflict resolution service, the Ombuds Office has had to initiate cost sharing — that is this service will now be charged at a rate to cover costs, which amounts to $46 an hour.

For more information about these services, or any aspect of the Ombuds Program Office, contact the staff at 7-3119. There also is a Web page at *http://www.lanl.gov/ ombuds/ org_assess_.html*, Conflict Resolution for Lab Organizations, that has a checklist of symptoms that could indicate the need for the service as well as intervention objectives.

New waste management refresher training required

Laboratory workers whose job responsibilities include waste management coordinator and waste generators are required to complete a new refresher training course, "Waste Generation Overview Refresher" (#21464). This is in addition to the initial "Waste Generation Overview" course (#8477).

Completion of the refresher training is mandatory under a November 2000 revision to the General Waste Management LIR (404-00-02). Waste generators must complete the refresher training course by Nov. 30. Thereafter, refresher training is required every three years.

To access the course by computer, go to the Virtual Training Center home page at *http://www.lanl.gov/ labview/training/training.html* online, then click on ES&H Training, Waste Management, and then Waste Generation Overview. Alternatively, the course can be accessed by going to the ESH-13 home page at *http://eshtraining.lanl.gov/* online and clicking on Waste Generation Overview Refresher.

More information is available in the May 14 Daily Newsbulletin on the World Wide Web (*http://www.lanl.gov/newsbulletin*).

Guns still taboo at Laboratory

by James E. Rickman

Although the New Mexico Legislature passed a bill signed into law by Gov. Gary Johnson that will allow citizens to carry concealed weapons if properly licensed, the new law won't apply to Los Alamos National Laboratory property.

"Since the Citizen's Safety Act was passed in the New Mexico State Legislature last session, we are concerned that some employees or visitors to the Lab might interpret the new law, which will go into effect on July 1, as a change in the prohibition against weapons on Lab property,"

said Bill Sprouse of the Lab's Office of Security Inquiries.

Jim Mitchell, senior counsel for the Lab, said the Citizen's Safety Act doesn't change federal regulations governing weapons on Lab property.

"We want people to understand that it is a violation of federal law to carry a gun or other dangerous weapons on Lab property," he said. "New Mexico's Citizen's Safety Act is subordinate to federal statute. Section 8 of New Mexico's Citizen's Safety Act very clearly underscores its subordination to the federal Atomic Energy Act."

Regulations under the Atomic Energy Act prohibit the unauthorized carry, transport or introduction of dangerous weapons, explosives or materials onto property owned or controlled by the Department of Energy. Violations of the act can result in severe fines, imprisonment or both.

"It's really never a good idea to bring a gun to the workplace," Sprouse said. "Please don't bring weapons on Lab property now or in the future."

'Get fit on Route 66'

The Laboratory's 17th annual Walking Month incentive, "Get Fit on Route 66," officially begins June 4 and ends Aug. 31. Lab workers can sign up at *drambuie.lanl.gov/~wellness/svc/motive/rt66/index.htm* online and print out materials needed to record their miles walked. Personnel who don't have access to a computer also can sign up through their office Walking Incentive coordinators, or at the Wellness Center

As part of the three-month program, there are a number of scheduled events planned, including more evening events and some in White Rock.

For more information, go to the Wellness Center Web site at *http://drambuie.lanl.gov/~wellness/svc/motive/rt66/index.htm* or see the May 14 Daily Newsbulletin at *www.lanl.gov/newsbulletin*.

HR/STB team up to improve student services

by Michael Carlson

More than 1,000 new and returning students will arrive at the Laboratory this spring and summer. Human Resources (HR) Division and the Science and Technology Base (STB) Programs Office are working to align oversight and support of the Lab's student programs, said Karen Burkett of Staffing (HR-5).

"A number of changes already have been made in time for summer students," said Burkett. "The services still are there, and in many cases enhanced.'

As part of the new student services, STB will match students with mentors, handle grievances that can't be resolved at the group level, coordinate new student orientations and develop information resources for students. HR will handle employment applications, salary determinations, [offer] letters, W-2 forms and health insurance issues.

"We are building a strong foundation together in order to create a positive learning experience for students," said Student Mentor Liaison Carole Rutten of the Education Programs Office (STB-EPO). "This is more of a partnership with HR," she said.

STB has hired new personnel, including Rutten, the former University of New Mexico, Los Alamos Manager of Student Services, to support STB's expanded role in student programs oversight.

Tony Gallegos

The Laboratory received a Quality New Mexico Diamond Recognition Award for loaning **Tony Gallegos** of the Quality Improvement Office (QIO) to QNM. QNM is a nonprofit organization that seeks to educate New Mexicans about quality; encourages and rewards quality in business, education, government and health care; and promotes an economic climate to foster and enhance the prosperity of New Mexico citizens. The Diamond Recognition Award is presented to organizations that support QNM's Loaned Executive Program. The program contributes significantly to New Mexico's economic development by teaching skills that allow organizations to improve the quality of their institution. Gallegos has been working at QNM as a loaned executive since 1999. He has served as QNM's operations manager and leader of the Business Operations Team and Alliance Team. Gallegos came to the Lab in 1998 as a consultant in the Community Relations Office.

Dinh Nguyen

Dinh Nguyen of High Power Microwaves, Advanced Accelerators and Electrodynamics Applications (LANSCE-9) has been appointed as the senior project leader for Directed Energy Programs Development. Nguyen will work closely with Department of Defense Program Manager Dan Prono; J. Darrell Morgeson, Decision Applications (D) Division director; and Don Cobb, director of threat reduction. Nguyen is responsible for coordinating and leading the Laboratory's internal program development activities for the DoD directed-energy activities and the Laboratory's external interactions with DoD directed energy customers, their agents and contractors. He will engage program development activities for the breadth of the Laboratory's Directed Energy technologies. A Laboratory employee since 1984, Nguyen has worked in the Chemical Science Technology (CST) and Los Alamos Neutron Science Center (LANSCE) divisions on such projects as single molecule detection, upconversion solid-state lasers, radio-frequency photoinjector, free-electron lasers, Linac coherent light sources and photocathodes for advanced lithography.

Rick Ulibarri of the Laboratory's Government Relations Office (GRO) is the new vice chairperson of the New Mexico Information Technology Commission. The primary mission of the New Mexico Information Technology Commission is to adopt and promulgate rules specifying the state information architecture and update the state strategic information technology plan.

Rick Ulibarri

Ulibarri, a 17-year veteran of the Laboratory, is the Laboratory's political liaison to the Governor's Office and the State Legislature. He has been on the commission since 1999 as the Lab's designated representative appointed by Laboratory Director John Browne. Ulibarri has a bachelor's degree in business from New Mexico Highlands University in Las Vegas, N.M., and a bachelor's degree in information technology from the University of California, Berkeley.

May service anniversaries

30 Year
Severino Aragon, ESA-WE
Janice Barnes, ESH-6
Fred Begay, CER-30
Dennis Brandt, NMT-DO
Michael Pacheco, MST-NHMFL

25 Year
Ruben Aguilar, NMT-3
G. D. Archuleta, IM-4
Bard Bennett Jr., NW-SS
Larry Berkbigler, ESA-MT
Art Bridge, LANSCE-3
William Cata, ESA-WMM
Thomas Cayton, NIS-2
Elaine Chavez, DX-7
Dona Espinoza, LC-LEL
Richard Lovato, LANSCE-9
David Martinez, DX-7
Lawrence Montoya, CCN-18
John Valencia, NIS-2
Mary Anne Yates, ALDTR

20 Year
Barbara Canavan, NIS-8
Gary Childers, BUS-2
Sara Cochrane, X-DO
Mary Ann Cotter, NIS-9
Peggy Gonzales, HR-7
Barbara Hernandez, BUS-2
Gabriel Herrera, NIS-6
Gail Hodyke, LC-GL
Gary Hogan, P-25
Marvin Maestas, NMT-DO
Robert Martinez, CCN-5
Patrick McDonnell, BUS-7
P. Dianne Nylander, C-DO
Henn Oona, DX-3
Mark Peters, P-21
Judy Pippin, CCN-2
Joanne Roybal, BUS-8
Ascension Salazar, NMT-2
David Scudder, P-22
William Spurgeon, NIS-9
Joel Williams, NMT-16

15 Year
Patti Buntain, ESA-WE
Linda Gallegos, ESA-DO
Charles Harrington, EES-9
Carol Hughes, ESH-2
William Inkret, C-INC
Richard Kovach, EES-7
Geoffrey Miller, C-INC
Alex Montano, CCN-5
Andrew Montoya, NMT-7
Donald Naranjo, FWO-SEM
Marisol Pulliam, BUS-2
Robert Reinovsky, NW-EP
Behzad Salimi, X-3
Tony Tomei, AAA-TPO
Carolyn Trujillo, DLDBAO
Vincent Trujillo, ESA-WE
Robert Vondreele, LANSCE-12

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May ...

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10 Year
James Covey, PM-DS
Deborah Enenbach, HR-5
R.C. Galvez-Martinez, BUS-1
Yolanda Garcia, BUS-8
Johnell Gonzales-Lujan, D-7
Kelly Hakonson, C-ACT
Shawn Harshbarger, NMT-8
Carol Hengstenberg, OEO
Albert Jiron, CER-31
Rober Kelsey, X-8
Margery Miller, IM-DO
Phillip Sena, PM-DS
Francisco Uribe, MST-11
Oliver Wilton, ESH-5

5 Year
Timothy Bass, CER-20
Langdon Bennett, X-4
Keith Bisset, D-5
Deirdre Boak, DX-1
Steven Buck, NIS-5
John Dunbar, B-1
Joetta Goda, NIS-6
Marc Haga, E-ET
Allen Huff, NMT-8
Steven Koch, ESH-20
Robert Lowrie, CCS-2
Angelique Neuman, NMT-9
Nancy Nicholas, NIS-6
Shawn Pautz, CCS-4
William Phillips, EES-11
Carlos Rael, NIS-5
Jonathan Teague, NMT-9
John Telford, P-22
Joel Vargas, NMT-4

Syndicated material

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Ergo checklist

by Fran Talley

Ergonomics is about the "fit" between people and design of objects, systems and the environment. The Lab's ergonomic Web site has a broad scope of information ranging from guidelines and equipment to the Lab's ergonomic standard and the institutional ergonomic committee (*http://www.esh.lanl.gov/~ergonomics/Welcome.html*).

Below are some tips from Ergonomics Program Manager Graciela Perez of Industrial Hygiene and Safety.

• Use a throw pillow in the lower curved portion of the back when sitting in chairs, couches or car seats that do not support the lower back.

• Place most frequently used and heaviest items in drawers or on shelves that are located above the knees and below the shoulders. This will avoid frequent lifting with unsafe postures.

• Ask for help when you are lifting heavy items such as delivered water jugs, furniture and electronic devices.

• Take the time to go to your local bike shop to ask a knowledgeable person if your bike "fits" you. Some bike shops have fit kits to measure your best fit on the bike. The following Web site provides guidelines for fitting your bicycle to you: *http://www.coloradocyclist.com/BikeFit/*

• Keep your body, especially your back and hands, warm when working on projects. This will increase circulation to the working muscles.

• Wear the correct size of jewelry. Look at your wrist after wearing your watch. If there are compression marks on the skin, then your watch band is too tight and may decrease circulation to your hands.

• Get up slowly and deliberately from chairs and sofas after long periods of sitting, such as after dinner, driving or sitting in a movie theatre. This will reduce sudden strain to the body.

• Avoid cradling the phone between your ear and shoulder for extended periods. Phones with headsets are readily available and free the hands and neck while talking on the phone.

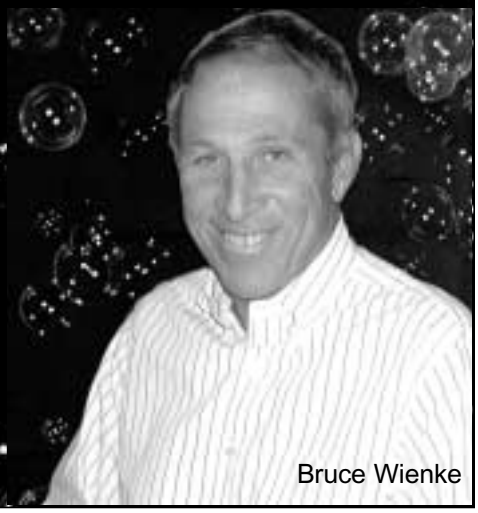
Physics and the deep blue sea

by Kevin Roark

When Bruce Wienke of Materials Science (X-7) goes deep-sea diving he's thinking about more than the adventure or the beauty of the oceans. He's also thinking about bubbles — the physics of bubbles.

"I became interested in diving procedures, training and safety during my time in Special Warfare in the 1960s," said Wienke. "And later, as a physicist, I became convinced that a realistic bio-physical model that would increase the safety of deep diving could be created based on the physics of bubble formation."

That biophysical model, called the Reduced Gradient Bubble Model, is well on its way to replacing the standard decompression dive tables used by underwater researchers for nearly 100 years.



Bruce Wienke

Based on the physics of bubble formation, RGBM sets limits for diving depth and duration to eliminate the formation of nitrogen and helium bubbles in the body, a condition known as decompression sickness, or the bends. What sets RGBM apart are its standards that allow divers to go deeper, stay longer and spend less time decompressing with increased safety.

"It's a revolution," he said. "The algorithm is being built into dive computers and tables for the general consumer and has been adopted as the official model for the National Association of Underwater Instructors, one of the leading dive training organizations."

With applications in commercial, technical, research and military diving, a big part of the reason for RGBM's acceptance is Wienke's diving experience — having logged more than 3,000 hours underwater as deep as 400 feet, and in locations all over the world, from Asia to the Caribbean, from under the polar ice of the Arctic and Antarctic to the tropic waters of the South Pacific. Wienke credits a large part of RGBM's success to his ability to speak a common diving language with the technical diving community.

"To these divers, I'm not just a physicist, I'm a diver, too," he said. "Myself and about 100 others have been diving using the RGBM table under a wide variety of conditions, so I have this connection with the technical divers. It's not only the research but the diving experience as well that confirms the value of RGBM."

Wienke has been with the Lab for 30 years and currently works in the nuclear weapons program, but in his spare time also is a NAUI instructor trainer and technical instructor and is a master instructor with the Professional Association of Diving Instructors. In the winter he coaches ski racers and recently took an overall second place at the Nastar, or National Standard Race, nationals for ski racing. He received his doctoral degree in particle physics from Northwestern University and is a veteran of the Vietnam War. Always an accomplished athlete, he quarterbacked the 1963 Northern Michigan Wildcats to a National Collegiate Athletic Association Division II national championship.

He is the author of five technical books on diving including "Physics, Physiology and Decompression Theory for the Technical and Commercial Diver." He is a fellow of the American Academy of Underwater Sciences and a Technical Committee member of the American Nuclear Society.

"The impact of RGBM work on divers all across the diving spectrum has been huge," he said. "The advent of dive computers a few years ago really changed the face of diving, now the RGBM algorithm is being incorporated in many commercial dive computers, causing yet another revolution in the business and sport of underwater diving."

What does the future hold for Wienke? "Sometimes I ponder what I'll do after I retire, if I retire. Then I realize I'll probably just end up continuing to come to work, because there's still so much I want to do."

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