

## Why Do People Smoke? BNL Research Looks Beyond Nicotine Using PET Scans of Brain

Nicotine may not be the only tobacco smoke ingredient that hooks smokers into addiction, suggests research at BNL's Center for Imaging and Neurosciences.

In the first report of a distinct biochemical effect triggered in the brain by cigarette smoke, Brookhaven scientists have found that smokers have a greatly reduced level of a crucial brain enzyme. Since previous studies elsewhere have acquitted nicotine as the cause, something else in cigarette smoke is at work in inhibiting this enzyme.

Published in the February 22 issue of *Nature*, the study found that smokers had an average of 40 percent less of the enzyme MAO B than nonsmokers and those who had kicked the habit.

MAO B is short for monoamine oxidase B. Previous studies have shown that it breaks down dopamine, a neurotransmitter associated with movement, motivation and reward. Less MAO B could result in enhanced dopamine activity, rewarding and reinforcing the behavior that caused the increase in dopamine—behavior such as smoking.

### Finding Goes Beyond Smoking

The study was performed by Chemistry Department and Medical Department researchers using the Lab's Positron Emission Tomography (PET) facility.

Its authors are: Chemistry's Joanna Fowler, head of the Lab's PET program; Medical's Nora Volkow, head of the Nuclear Medicine Program; Gene-Jack Wang and Naomi Pappas, Medical; Chemistry's Jean Logan, Robert MacGregor, David Alexoff, Colleen Shea, Alfred Wolf and Donald Warner;

and research collaborators Ivana Zezulkova and Raphael Cilento.

Their finding, drawn from PET scans of 20 subjects, may also help explain smokers' paradoxically lower risk of developing Parkinson's disease, and the higher incidence of smoking among drug addicts and those with psychiatric disorders.

And for those who smoke but want to quit, MAO B could one day be the target of specialized treatments.

Said Fowler, "Even though smoking is responsible for hundreds of thousands of deaths and illnesses each year, we know relatively little about how smoking affects the human brain. But if we want to find ways to help people fight their addiction to tobacco and quit smoking, we need to develop a better understanding of why people smoke."

### The Way It Might Work

The team's findings reflect a complex brain chemistry influenced by many factors.

"Nicotine is known to elevate brain dopamine," said Fowler. "But the markedly lower MAO B levels in the smokers' brains suggest that whatever is inhibiting MAO B could actually be acting in concert with nicotine to enhance dopamine's activity by preventing its breakdown."

"Increased dopamine, and the accompanying feeling of pleasure, would then reinforce smokers' smoking behavior and continue their addiction," said Volkow. "This effect could also reinforce other addictions and also act in a therapeutic fashion in individuals with psychiatric disorders like depression."

Lower MAO B levels in smokers'

**Nora Volkow (left), Medical Department, and Joanna Fowler, Chemistry Department, examine brain scans from Brookhaven's PET study of smoking's influence on brain chemistry.**

Photos in this issue by Roger Stoutenburgh



brains could also help explain why smokers have a lower incidence of Parkinson's disease than nonsmokers.

Explained Fowler, "When MAO B breaks down dopamine, it produces hydrogen peroxide as a by-product. Hydrogen peroxide is a source of free radicals, which could cause damage to nerve cells." Parkinson's is a chronic, progressive nerve disease aggravated by a shortage of dopamine.

### Tracing the Tracer's Path

In the study, the researchers made PET scans of the brains of eight smokers, eight nonsmokers and four former smokers. The subjects, all volunteers, were healthy men and women between the ages of 23 and 86.

Before scanning, each subject was given a trace amount of a substance that is known to bind to MAO B, but that had been specially "labeled" with carbon-11, a short-lived radioactive isotope. In PET scanning, such a substance is known as a radiotracer. For

the MAO B study, the radiotracer used was a version of the commonly used anti-Parkinson's drug L-deprenyl, specially prepared by BNL chemists Richard Ferrieri, MacGregor and Shea.

The radiotracer, which gives off subatomic particles known as positrons when it decays, allows scientists to use BNL's PET facility to track the movement of the tracer in the subjects' brains, and hence the location and concentration of MAO B in various brain regions.

The radioactively labeled L-deprenyl delivers only a small dose of radiation to the subject because of its very short half-life of 20 minutes. All PET studies at BNL are reviewed by the Laboratory's independent Human Subjects Research Committee, and all subjects give their informed consent.

The study was funded by the U.S. Department of Energy's Office of Health and Environmental Research and the National Institutes of Health.

— Kara Villamil

## DOE Begins Registration For Public Water Hookups

To help the residents of a designated area in northern Shirley fill out applications for public water, the U.S. Department of Energy (DOE) has scheduled registration workshops at the Longwood High School in February and March.

DOE is providing the public water hookups to these residents as a precaution, to eliminate any possibility that, in the future, they could consume well water contaminated by BNL (see Brookhaven Bulletin, February 9, 1996).

This decision followed on the Lab's finding chemical contamination under its site and just south of its southern boundary. The result of past practices no longer followed today, the highest concentration of contaminants is deep underground, below the depth at which domestic wells are typically drilled. To remedy the situation, BNL is working under the regulatory guidance of DOE, the Environmental Protection Agency and New York State (NYS).

Meanwhile, DOE is offering free public water hookups to North Shirley and East Yaphank residents in an area bounded by Colin and Carleton Drives on the north, Flower Hill Drive on the south, River Road on the west and Sleepy Hollow Drive on the east.

### Industrial Park Plume

Other potential sources of chemical contamination exist. One known source that has affected domestic wells, comes from a former electronics firm, Precision Concepts, that was in the industrial park located between the Lab and the homes in question. The Suffolk County Department of Health Services (SCDHS) has stated that, based on its chemical parameters, location and depth, the current contamination found in domestic wells in the affected area is most probably from this source.

This statement is borne out by the most recent well-test finding. In a cooperative program with BNL, (continued on page 2)

## New Manager for QMO

Victor Gutierrez, who has been a quality assurance (QA) engineer at BNL since 1980, has been named manager of the Lab's Quality Management Office (QMO). Gutierrez succeeds Marvin Shear, who retired January 5.

Noting that Gutierrez has had 25 years' QA experience, Mike Bebon, Assistant Director for Management & Physical Plant, said, "I am looking forward to working with Victor in his new role as we continue to implement quality principles at BNL."

Bebon also commented on Shear's many accomplishments in 15 years of service at BNL, ten of them as head of Brookhaven's QMO: "Under Marvin's guidance, BNL took a prominent role in developing an appropriate adaptation of the U.S. Department of Energy's [DOE] Quality Assurance Order for application to basic research. These concepts were subsequently incorporated into the DOE Energy Research

Standard for QA in Research."

Gutierrez stated that a strength of quality management is its focus on process improvement. One of his current goals for the QMO "is to help the Laboratory remain viable in these tough economic times." The QMO will work with the departments and divisions in applying established approaches and tools, useful for improving process efficiency and reducing costs.

Gutierrez received his bachelor's degree in electrical engineering from the City College of New York in 1971. He held various engineering positions in industry, including senior field engineer at Underwriters Laboratories, before coming to Brookhaven to become a quality assurance engineer with ISABELLE, an accelerator project that was canceled in 1983. In 1984, Gutierrez joined the Lab's new Quality Assurance Office, which became the QMO in 1994.

— Diane Greenberg



Victor Gutierrez

## At Community Meeting, BNLers Hear What's Being Said About Lab

What is the local community thinking, saying and believing about BNL? And what could that mean for the Lab?

With these questions and others in mind, several employees of BNL and the U.S. Department of Energy's (DOE) Brookhaven Group attended a community meeting on the morning of Saturday, February 10, at Longwood Junior High School.

They went on their own time as citizens, not as Lab ambassadors, to listen firsthand to BNL's neighbors.

### A Diversity of Voices

What they heard was the outrage of a community that is angry at the Lab and afraid that its well water is contaminated with BNL chemicals that have traveled through local groundwater.

They also heard community organizers and environmental activists charge BNL with deception and wrongdoing.

They heard an independent scientist accuse the Lab of causing breast cancer in neighboring women — a charge that he has leveled against several nuclear power reactors in the past, only to be rebutted strongly by several state departments of health.

And they heard from lawyers who have filed a class-action lawsuit against BNL and Associated Univer-

sities, Inc., asserting that the Lab's emissions have damaged the health and property values of local residents.

Organized by Fish Unlimited, a local fisheries conservation group that has confronted BNL on environmental issues since late last summer, the meeting drew about 150 local residents as well as the BNL and DOE employees. It also attracted the media, including News 12, Newsday and WPIX-TV.

Others speaking during the meeting's question-and-answer period included a local civic group president who has communicated with BNL for years on environmental issues, and a local librarian, who clutched a thick notebook of BNL public documents from her library's shelves.

For the most part, they said, the Lab has been cooperative in providing information to the community and taking responsibility for pollution that resulted from its past practices. But their comments were exceptions in a sea of misgivings about BNL.

### Reaching Out

Another of those who spoke during the meeting's question-and-answer period was Kathleen McIntyre, a health physicist in BNL's Safety & Environmental Protection Division who lives across the William Floyd Parkway from the Lab.



**Kathleen McIntyre**

McIntyre told of her confidence in BNL's responsiveness to the community, and of the Lab's openness on environmental issues.

One of the last to speak, she corrected some activists' assertions about the public water hookups that DOE will soon begin providing to some North Shirley residents as a precaution against future well contamination (see story on page 1).

McIntyre also reminded those present of the Suffolk County Department of Health Services' statement that chemicals found recently in six private North Shirley wells came not from BNL, but from another source located between BNL and the neighborhood.

After the meeting, McIntyre observed that those who participate in their civic associations and have had contact with BNL's community relations coordinators seemed more informed about the Lab and even skeptical about the activists' and lawyers' motives.

"A number of the people who asked me questions after I spoke and raised

some very serious concerns do not attend PTA or civic meetings, or read their newsletters," McIntyre said. "It's these people we need to reach, one by one if necessary. We need to be truthful and supportive, and we need to address their concerns with every resource available to us."

Among the avenues of communication being paved between BNL and local residents is a community forum, now being formed, which will include activists and community leaders from the area who will work with BNL on many issues.

Said Sue Davis, BNL Associate Director for Reactor, Safety & Security, "The BNLers who attended that meeting saw firsthand that the local community is worried about the Lab, and worried that we're not doing anything to clean up pollution from past approved activities, or to reduce and eliminate our releases to the environment, or protect their health and property values.

"Their outrage shows us how much we all need to do to help our friends and neighbors learn as much as possible about Brookhaven, its activities, and the way it treats the environment," Davis continued. "After all, BNL's employees are BNL, so what the community believes about the Lab, it believes about each of us."

— Kara Villamil

## Suffolk County Honors Arlean Vanslyke During Black History Month

Arlean Vanslyke, an administrative secretary in BNL's Department of Applied Science (DAS), was one of 16 people honored at Suffolk County's annual Black History Month celebration last Thursday, February 15.

At the evening ceremony held in Riverhead's First Baptist Church, County Executive Robert Gaffney and Mack Smith, Executive Chairman of Gaffney's African American Advisory Board, awarded Vanslyke a medallion and a certificate of appreciation for her "contribution to the betterment of Eastern Suffolk County."

Vanslyke also received a letter dated February 15 from Robert D'Angio, Manager of BNL's Human Resources Division. "On behalf of Brookhaven National Laboratory and its director, Dr. Samios, we congratulate you on being selected as an honoree at the Annual Black History Month celebration," wrote D'Angio.

Noting that Vanslyke, who joined the Lab on April 2, 1979, has been "a valued employee," D'Angio continued. "As a supervisor of our High School [Youth on Campus] and Science and Engineering students for more than 10 years, you have imparted a sense of pride and accomplishment in each of them. Your contributions have been outstanding, and we value your service."

Vanslyke's contributions have been largely in the secretarial area, she said, adding that she offers the students "anything that's needed to help get the task done, including a shoulder to cry on."

In addition, Vanslyke is a member of BNL's Afro-American Culture Club and has frequently served as a DAS Blood Drive captain, DAS United Way representative and BNL Food Drive building coordinator.

Outside of work, Vanslyke is equally as committed. A member of the National Association for the Advancement of Colored People, or NAACP, she has been Executive Secretary of the Eastern Long Island Branch for about six years. She has participated in marches in Washington, D.C., and attended state, regional and national



**Arlean Vanslyke**

training sessions and conferences.

A member of the First Baptist Church of Bridgehampton since 1954, Vanslyke has served as a monitor for the Sunshine Band and Youth Choir, a Sunday School primary teacher, president of the Women's Guild, and director of Christian education. Also through her church, she taught remedial reading in a program initiated by the Bridgehampton Child Care and Recreation Center.

Vanslyke is also a member of the Order of the Eastern Star, the female arm of the Masons, and she is treasurer of both Aurora Chapter No. 66,

### Speakers Needed

BNL needs employees to present the Laboratory's side of issues and to spread the word about the world-class research being done here.

One way to do this is as a speaker — perhaps at a meeting of your Parent-Teacher Organization or another local group.

If you'd like to volunteer as a guest speaker, please do so through the Speakers Bureau coordinated by Janet Sillas, Public Affairs Office, Ext. 2345.

in Southampton, and the Aurora Starlight Club.

Vanslyke's volunteer work began when her son Albert took up scouting and she became a Cub Scout den mother in Southampton. She has also chaperoned school-sponsored field trips.

How does Vanslyke manage so many activities so well? "They just build on one another," she said. "It's sort of a pyramid effect."

And Vanslyke believes she gets as

much from her activities as she gives to them. "I find personal satisfaction in all of them, and I've become a positive role model for my son and his friends," she said.

With all her involvement, Vanslyke added, "I'm not out there by myself. There are a lot of other people also making good things happen." One of them is Arlean Vanslyke's twin sister Jerlean Hopson, who was also an honoree at Suffolk County's Black History Month celebration. — Anita Cohen

### Registration for Public Water Hookups (cont'd.)

SCDHS has so far sampled 379 of a total of roughly 450 wells for 95 different parameters to see if they meet the NYS drinking water standard, which is among the strictest in the nation. By February 9, as was reported in the Bulletin, five wells had tested at or above the NYS drinking water standard for 1,1,1-trichloroethane, the common solvent known as TCA, which is widely used throughout Long Island, including BNL. Now, a sixth well has tested above the NYS standard for trichlorofluoromethane. This is a type of Freon, a contaminant that has not been found in BNL's monitoring wells.

### Some Hookups Already Completed

A Suffolk County Water Authority (SWCA) contractor is scheduled to start neighborhood-wide hookups to public water as soon as the ground has thawed and the necessary arrangements between DOE and SCWA have been made. However, the contaminated wells have priority. SWCA workers have already hooked up three of these six wells, and a fourth hookup is under way. In the interim, BNL is providing the two other homes with bottled water and carbon filters.

BNL's Office of Environmental Restoration (OER) staff, who plan the Lab's remedial action under the federal Superfund law, have been active in assisting DOE and SCWA in coordinating the hookup effort.

Said Bill Gunther, OER Manager, "The aim is to put the work forward as conveniently as possible for the residents. Already, DOE and BNL have helped out one home owner, whose well tested free from contamination, but who had no water because his well pump had stopped working. We fixed the pump without charge, so the home owner could continue using his uncontaminated well water until hookup time. We think the registration workshops will also be helpful, especially in providing an opportunity for residents to question and understand the exact procedure. By fall, the work should be done, and everyone should be hooked up."

Residents have been notified by mail of the five scheduled workshops, one on February 24, and the others on March 6, 9, 20 and 23. By accepting the free public water hookups, residents will not waive their rights to legal action. For more information, contact DOE Project Manager Rich Freeman at (516) 344-2093. — Liz Seubert

## 22 BNLers Master Environmental Technology

The New York Institute of Technology (NYIT) held a commencement ceremony at BNL on December 13, to celebrate the achievement of 22 BNLers, who have graduated as Masters of Science in environmental technology with the exceptional cumulative grade point average of 3.7. Thirteen other BNL staff who have participated in this on-site program sponsored by the Human Resources (HR) Division, are expected to graduate in June.

"I congratulate this group on their excellent results," said Sue Davis, BNL's Associate Director for Reactor, Safety & Security. "It is particularly satisfying that so many employees chose to extend their knowledge of topics so important to the Laboratory. The sustained motivation and effort put into this achievement by both the students and the senior Lab staff who acted as advisors demonstrate the vital interest in and concern for environmental issues prevalent at BNL."

Marilyn Pandorf, HR Senior Training Specialist, initiated and coordinated the 33-credit program with a capability that won her a NYIT award, presented that evening. The program had started in June 1993 and included a six-credit project thesis. Students took the course work and the first half of their thesis in lockstep and completed the remainder of the project work independently.

"This was a very successful venture for both BNL and NYIT," Pandorf said. "The caliber of the students and the applicability of the subject matter — for example, courses such as radioactive-waste management — strengthened the curriculum and resulted in new, high standards of achievement. I was very satisfied to see so many employees reach their goals — 35 of the 37 who originally enrolled have graduated or are within three credits of their degree."

The high standard of the work has already been recognized. NYIT encouraged the students to send abstracts of



Among the participants in the on-site program Masters in Environmental Technology given by New York Institute of Technology and coordinated by Marilyn Pandorf (back right), Human Resources Division; were: (back two rows, from left) Karl Shurberg\*, Safety & Environmental Protection (SEP) Division; George Goode\*, SEP; Glen Todzia, SEP; Edmund Paulak\*, SEP; Phil Harrington\*, SEP; Thomas Sperry\*, SEP; Robert Lee\*, SEP; Chris Hanley\*, Plant Engineering (PE) Division; Bill Pemberton\*, SEP; (front, from left) Edward Richards\*, SEP; Edward Grove\*, Department of Advanced Technology (DAT); Thomas Timko\*, SEP; Irving Montanez, now retired from the Alternating Gradient Synchrotron (AGS) Department; Michael Cowell\*, SEP and Office of Environmental Restoration; Wendy Mosca\*, SEP; and George Meinken\*, Medical Department. Those marked with a star graduated December 13. Other December 13 graduates not present were: John Bloom, Reactor Division; Bruce Dionne, DAT; Arthur Harris, Reactor; Henry Hauptman, Reactor; Joseph Levesque, SEP; Somkid Nimnual, DAT; Steven Perlstein, AGS; and James Stillwell, SEP. Other program participants who expect to graduate very shortly are: Teresa Baker, Director's Office; Carlee Beecher, SEP; Paul Bergh, SEP; Andrea Epple, SEP; Nathaniel Foster, SEP/Staff Services; Philip Hayde, SEP; Denise Jacob, SEP; Robert McNair, Reactor; Richard Travis, DAT; Jeffrey Williams, SEP; and Michael Wiplich, Physics Department.

their theses to the Northeast Waste Management Officials' Association. As a result, John Bloom, Reactor Division, with "The CFC Ban — Is It Warranted?", and Philip Harrington, Safety & Environmental Protection Division, with "Design of an Energy Efficient Outdoor Nighttime Urban Lighting Project," were among the 25 graduates of many different universities who presented their papers to the Pollution Prevention Consortium of New England in Boston on February 9.

Pandorf and NYIT also appreciated the valuable suggestions and exceptional support of Bruce Dionne, DAT. For his efforts in coordinating the project theses and enlisting BNL technical advisors, Dionne won the NYIT Student Recognition Award.

"I thought it would be a good idea to get some key BNL people to suggest what kind of studies would be most useful in restoring the environment," said Dionne. "With their help, we generated a list of 25 basic thesis projects that had some applicability to the Lab, and, eventually, the students selected about a dozen of these topics." Dionne's choice, for example, was a radiological risk assessment associated with Bldg. 650, the old laundry where clothes contaminated by radioactivity were cleaned.

Not only did this work help Dionne get his degree, but it may also be of practical use for BNL's Office of Environmental Restoration (OER), the office responsible for Superfund remediation on site. Said Bill Gunther, OER Manager, "We welcome all the interest and suggestions of employees and the public. Several of these thesis projects contain ideas and information that should prove valuable to OER's future work."

For example, graduate Michael Cowell, who works in OER, studied and wrote on the history, habitat and protocols of the eastern tiger salamander — an endangered species that is found on site. Like Dionne, Cowell found that having the classes at the Lab was extremely convenient and studying with a group of other BNLers was a great motivating factor.

## Dial-Up Access

For information on the new individual dial-up access service (IDAS) of the Computing & Communications Division (CCD) and an understanding of how it will affect modem access to the BNL computer network beginning March 4, go to the World Wide Web location <http://www.ccd.bnl.gov/nss/idas> or click IDAS under QuickRef on the CCD home page.

## Ski BERA

Join BERA for a one-day ski trip on Wednesday, March 13 to Brodie Mountain. The bus will leave from the BNL tennis-court parking lot at 5 a.m., with an extra pickup at LIE exit 63, and it will return by 8:30 p.m. The cost of \$44 for adults and \$38 for children under 12 includes round-trip bus transportation and lift tickets. Ski rentals will be available on the bus.

Purchase tickets at the BERA Sales Office, Berkner Hall. For more information, call Andrea Dehler, Ext. 3347, or Augie Hoffmann, Ext. 3884.

## WordPerfect Users

On Tuesday, February 27, from 2 to 3 p.m. in the CCD Seminar Room, Bldg. 515, the WordPerfect Users' Group will repeat a demonstration of the template of the BNL employee-evaluation form, and discuss how to create and edit a template. Supervisors are encouraged to attend and may obtain the template by bringing a formatted 3.5-inch floppy disk to the meeting. To reserve a spot at the demonstration, or for more information, call Donna-Ree Rodriguez, Ext. 7261.

## Tango, Please!

Advanced beginners may learn merengue at 5:30 p.m. and/or tango at 6:30 p.m. in four, 1-hour lessons, on Wednesdays February 28, and March 6, 13 and 20. Intermediates may take fox trot at 7:30 p.m. Sponsored by the BNL Ballroom, Latin & Swing Dance Club, each four-hour class costs \$15 per person; classes are held in the North Ballroom of the Brookhaven Center. Singles and couples are welcome, as the club attempts to sign up equal numbers of women and men. To register or for more information, call Marsha Belford, Ext. 5053.

## Amateur Radio

The BERA Amateur Radio Club will next meet at noon on Thursday, February 29, in Room D, Berkner Hall. All Lab employees, guests and licensed amateur-radio operators are invited to attend. For more information, call Chris Neuberger, Ext. 4160, or Nick Franco, Ext. 5467.

## AUI Lecture Canceled

An AUI Lecture by Richard Deslattes, which had been scheduled for Wednesday, March 6, has been canceled. Although the lecture had not yet been publicized in the Brookhaven Bulletin, press information had already gone out, so notices may appear in local media even though the talk is canceled.

## BROOKHAVEN BULLETIN

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### Outreach Workshop

### How to Handle Stress by Managing Time

If 24 hours in a day aren't enough, then the next Outreach workshop is for you: Sponsored by the Employee Assistance Program (EAP) of the Occupational Medicine Clinic, "Stress and Time Management" will be discussed by clinical psychologist Lydia Seggev on Wednesday, February 28, in Berkner Hall. All are invited, and the talk will be available afterwards on audiocassettes in the Research Library, Bldg. 477.

Today's fast-paced and activity-packed world results in a lot of stress. After discussing sources of stress, Seggev will talk about three categories of stress: imaginary, anticipatory and catastrophic. In offering approaches to minimizing stress, the speaker will review time-management techniques that are effective in reducing stress and tension.

Lydia Seggev, Ph.D., is a graduate of the postdoctoral program in psychology and psychoanalysis at Adelphi University. Past president of the Nassau County Psychological Association, she has a private practice in Roslyn for psychotherapy and psychoanalysis.

To register for this workshop, complete and return the bottom portion of the Outreach flyer recently sent to all employees to EAP Staff Psychologist Dianne Polowczyk, Bldg. 490, by Tuesday, February 27.

### Stress Management 101

For those who are seriously stressed out, the EAP will offer a four-part, lunchtime Outreach workshop "Managing Stress More Effectively" on March 8, 13 and 27, and April 3.

To be led by clinical psychologist Susan Dermitt, the workshop will help participants learn about stress and practice stress-reduction techniques. Dermitt will discuss stress triggers; people's physical, mental and emotional responses to stress; and new responses that can make people under stress feel more comfortable and in control.

This four-part workshop will be limited to the first 40 people who register. For more information, call the EAP, Ext. 4567.

