EVOLUTION AND CHANGE. The exceptional reputation of Boston University School of Medicine (BUSM) over the past century and a half has been based on the School's ability to anticipate, embrace, and react to these conditions. As we begin the 21st century and face new challenges on the campus and in the curriculum, we will continue to adjust to provide innovative leadership in medical education.

The School's evolution is evident on both physical and academic levels. From new construction projects to the plans for future expansion featured in the Campus Growth section (see page 14), the campus is continually expanding and improving. Academically, a new mentoring program aimed at helping our students get the most from their Medical School experience is ensuring that faculty encourage professional, ethical, and humanitarian values in our graduates (see page 10). Another exciting evolution is the opening of the Center for Biomedical Imaging, which houses a new magnetic resonance imaging scanner dedicated solely to research on the BU campus (see page 16).

BUSM's evolution is continuing on a national level. In the feature "Bringing Research to a New Level" (see page 2), we proudly describe the Medical Center's selection to receive the $128 million federal award to build a biosafety level 4 laboratory. Together with Boston Medical Center and the National Institute of Allergy and Infectious Diseases, BUSM researchers will utilize the laboratory to manage and direct research into emerging infectious diseases and agents of bioterrorism, such as anthrax, Ebola virus, plague, and smallpox. The lab is expected to generate $1.7 billion in research during the next 20 years, and the results from its research should benefit society as a whole.

Perhaps the most prominent change that will take place on campus in the near future will be the naming of a new Medical School dean. The difficult process of selecting a new leader has begun, and a national search is under way for candidates whose goals and personal characteristics fit with our institution. Already a long list has been narrowed to approximately a dozen candidates, and interviews are ongoing. A handful of those interviewed will meet with former BUSM Dean and current President ad interim Aram Chobanian this summer, and, if the process continues on schedule, the School will be welcoming both a new class and a new dean this fall.

On a sad note, the School and the entire medical community lost a true friend this winter with the passing of Norman Levinsky. Having spent more than 40 years at BUSM as chairman of the Department of Medicine and chief of Renal Section in the Department of Medicine, Dr. Levinsky was a vital part of the foundation that keeps institutions such as ours strong. One of the longest-serving chairs of an academic medical department in the nation, he was a talented doctor, gifted investigator, good friend, and wise mentor. He touched the lives of so many colleagues, students, and patients and will be sorely missed.

In this time of transition, Thomas Moore, assistant provost for Clinical Research, professor of medicine at BUSM, and director of the BUMC Office of Clinical Research, takes on the role of acting provost. Tom's skills as an outstanding clinician, academician, and administrator make him an excellent choice for this leadership position.

Sincerely,

John McCahan, MD
FEATURES

Bringing Research to a New Level 2
BUMC will build a state-of-the-art lab for the study of infectious diseases.

Novel System Helps Mentor Students 10
BUSM aims to provide students with advice and role models.

Campus Growth 14
New construction projects to expand the campus.

MRI Center Dedicated to Research Opens 16
Investigators get access to a new high-powered MRI scanner.

DEPARTMENTS

New Appointments 19

In Brief 20

Grants and Major Contributions 22

Alumni Awards 24

In Memoriam 26
Life expectancy for American citizens is at an all-time high, and medical research has played a large role in this achievement. Through decades of studying infectious diseases, investigators have been able to develop diagnostic tests, vaccines, and treatments to protect the public's health. The development and dissemination of the polio vaccine, for example, has dramatically reduced the incidence of this disease.

However the threat posed to society is continuous, as diseases naturally emerge and evolve. Even with medical advances, infectious diseases—HIV/AIDS, diarrheal diseases, and malaria, for instance—are a leading cause of death worldwide. Recognizing this fact, the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH), has led the endeavor in our nation to combat infectious diseases for more than 50 years by supporting medical research.

When the anthrax attacks began in October 2001, the nation became acutely aware of another potential threat from disease—its use as a weapon of bioterrorism. In response, the NIAID devised a plan to expand its biodefense research. The goal: to protect the population against dangerous infectious diseases, whether they occur naturally or are purposefully released in a bioterrorist attack.

As part of this national program, the NIAID awarded Boston University Medical Center (BUMC) $128 million to build a National Biocontainment Laboratory (NBL). It is one of the largest awards ever given to a university, and the application process was competitive. With this award, BUMC will construct a 223,000-square-foot lab to be called the National Emerging Infectious Diseases Laboratories (NEIDL). The lab's mission will be to develop diagnostic tests, treatments, and vaccines for some of the most deadly infectious diseases known to mankind.

"There is a huge void in our ability to respond to infectious diseases," says Mark Klempner, MD, associate provost for research at Boston University School of Medicine (BUSM), principal investigator of the grant, and director of the NEIDL. "The CDC [Centers for Disease Control and Prevention] tracks epidemics and specializes in rapid identification of diseases. But what it doesn't do and what we
There is a huge void in our ability to respond to infectious diseases," says Mark Klempner, MD. "We need to better define how these microorganisms cause the diseases that they do. We need diagnostics, therapeutics, and vaccines. That's the void we're trying to fill."
don’t have is a national strategy to rapidly diagnose, treat, and prevent these diseases. We need to better define how these microorganisms cause the diseases that they do. We need diagnostics, therapeutics, and vaccines. That’s the void we’re trying to fill.”

Initially, the fundamental mission of the lab will be to investigate and better understand infectious diseases with a priority on what the CDC labels category A agents, those microorganisms recognized as the most serious threats to public health. Researchers need to understand the pathogenesis of these diseases so they can identify points of intervention, says Klempner, whose research career has focused on the studies of infectious diseases. For the past 13 years, he has worked mainly on emerging infectious diseases, particularly Lyme disease.

Klempner defines emerging infectious diseases as those that have newly surfaced by virtue of being previously unrecognized, citing severe acute respiratory syndrome (SARS) and hepatitis C as examples. Re-emerging infectious diseases, he says, are those the medical community has known about, but for various reasons these diseases weren’t high priorities for researchers. “For example, there was no research going on for smallpox because the disease was gone,” says Klempner. “However, it has re-emerged by virtue of the possibility that it could be used as an agent of terror.”

Characteristics of category A agents as defined by the CDC include high morbidity and mortality, ease of transmission, and ability to cause large outbreaks, therefore requiring special public health preparedness. Anthrax, botulism, tularemia, and plague are several examples. “Category A agents are the bad actors, and we don’t know a lot about them. There is an enormous amount of work that needs to be done,” says John Murphy, PhD, co-principal investigator on the NBL grant, associate director of the NEIDL, and associate director of BUSM’s graduate program in molecular medicine.

Klempner asked Murphy to work with him on the project and help guide the science behind it because of Murphy’s background: Not only does he have more than 20 years of experience as a researcher, focusing on bacterial toxinoology and, more specifically, diphtheria, but he also previously worked in a biosafety level 4 (BSL-4) lab. The government requires labs to meet certain safety levels depending on the agents that will be handled. BSL-4, the highest containment rating, is used for the most dangerous microorganisms, such as cat-
category A agents. Because researchers will be working with these organisms at the NEIDL, it will house a BSL-4 lab.

To ensure the safety of both the lab’s employees and the surrounding community, stringent security measures will be instituted. A secured perimeter that meets Department of Defense standards will surround the building, to which there will be only two entrances. Security systems will be in place at both entrances so that only people who possess the appropriate authorized identification can enter. Once inside the building, codes will be required to access certain areas. To get to the BSL-4 containment area, researchers will have to pass a biometric or iris scan and know codes, and then additional authorized employees with keys will be required for access. The building will have safety systems for air, water, and sewage. Researchers will don safety suits to do their work. These examples just skim the surface of the measures being taken. (For more details, see sidebar “How Safe Is It?”)

The focus of the entire building will be on safety for the researchers, employees, community, and environment. BUMC can turn to the history of operation of BSL-4 labs for reassurance. Five such labs already exist in North America (four in the United States, one in Canada), and during their more than 77 years of combined operation, there has never been a community incident or environmental release of an agent. “The technology going into these buildings is state of the art,” says Murphy. “And on top of that, the level of infectious material that will be in the facility—and it will be in a lock-down state—will be very, very small.”

In fact, only 13 percent of the building’s net space will be devoted to BSL-4 work. Most research into infectious diseases concentrates on using pieces of the organism—proteins, DNA, and RNA molecules—that are not infectious or dangerous, says Klempner. Researching, creating, and verifying vaccines—all of this work can be done in BSL-2 and BSL-3 labs, which will occupy the majority of the research institute. “Only those pieces where there is a risk of infection to the workers and exposure to intact infectious material will be done at BSL-4. That occupies generally a tiny piece of the overall research agenda,” says Klempner. “It’s a

How Safe Is It?

Inside a biosafety level 4 (BSL-4) lab reside some of the most potentially dangerous microorganisms known to mankind. To protect both the staff and the surrounding community, security and safety experts design and construct BSL-4 labs to meet the strictest government standards. Following are some of the features that will make Boston University Medical Center’s National Emerging Infectious Diseases Laboratories (NEIDL) one of the safest and most secure facilities in the world.

Perimeter fencing designed to meet state and Department of Defense standards will surround the NEIDL at a distance of 150 feet. Those entering the building will encounter a secured entry system that will include optical turnstiles, security guards, metal detectors, closed-circuit television surveillance, intrusion alarms, and other devices. Personnel, who will undergo background checks before hiring, may enter only the areas for which they are specifically authorized. The further into the building they go, the more clearance they’ll need. Gaining access to the agents, which will be kept in locked liquid-nitrogen containers, will require two researchers, both of whom will have to pass biometric or iris scans and know codes. Unlocking the microorganisms will require two keys.

The building will be completely airtight—all the seams, joints, and doors will be sealed. The air that flows in and out of the building will be double filtered using high-efficiency particulate air (HEPA) filters. The ultra-fine fibers in HEPA filters can trap any airborne bacteria or virus and remove microscopic particles of 0.3 microns and smaller from the air with almost 100 percent efficiency. (A typical bacterium measures 1 micron in length.)

Nothing will leave the lab without first undergoing decontamination. Other safety features include airlocks, fumigation chambers, disinfectant dunk tanks, and wastewater treatment systems. Redundancies, such as backup power sources, as well as buffer corridors and floors surrounding the lab areas, will provide extra layers of protection.

Beyond the physical design of the building, researchers will take even further safety measures. Before entering the BSL-4 lab, they will be required to take off everything, including jewelry, and take a decontaminating shower. Next they’ll put on special surgical scrubs and booties; their double-layered gloves will be taped at the wrists to seal the junction with the suit. Once sealed in their suits, researchers will enter the biocontainment area through an airlock where they will plug into an air source. Before leaving they will take another disinfectant shower while still fully suited. Work surfaces will be regularly decontaminated, and solid and liquid waste will be decontaminated and meet or exceed the environmental standards of the neighboring community before it leaves the facility.
very important piece. And certainly when you get to the point of doing challenge experiments where you’re trying to see if a vaccine is protective, that has to be done at BSL-4.”

Murphy adds that because of all the precautions that must be taken, like donning safety suits, the object is not to work at BSL-4 unless it’s absolutely necessary. “I suppose the analogy you could make is it’s like playing Beethoven’s Fifth through large inflexible rubber gloves. You can do it, but you really have to want to,” he says.

In addition to the BSL-4 lab, the facility will contain 11 state-of-the-art core laboratories, making this facility one of the most sophisticated research labs in the world to do emerging and re-emerging infectious disease research. “The origin of these labs came from us asking during the design phase ‘what kind of facility and technologies will be on the cutting edge ten years from now?’” says Klempner.

Some of the more cutting-edge core labs will be in the area of imaging, from cellular and molecular imaging to whole animal imaging, says Klempner. For example, the Cell & Tissue Imaging Core will offer such high-tech equipment as a cryo-electron microscope, a microtome, a confocal microscope, and a deltavision system. Researchers will be able to examine tissue, cell, and other biological specimens for research and diagnostic purposes, as well as visualize molecules in living and fixed tissues, cells, and organisms in multiple dimensions.

The imaging core will also house two of the most powerful MRI scanners available for nonhuman research, a 9.4-tesla unit and a 4.7-tesla unit. Researchers will be able to conduct dynamic functional MRI studies using spin-echo and gradient-echo imaging techniques, as well as cerebral blood flow (CBF) enhancing techniques. Additionally, they will be able to perform perfusion studies using spin-labeling techniques for both clinical and functional studies.

There will also be a High Throughput Screening Core, notes Klempner, which will be used for combi-

### More Than a BSL-4 Lab

Along with the biosafety level 4 (BSL-4) lab, the National Emerging Infectious Diseases Laboratories will house 11 core laboratories offering the best high-tech equipment available. These core labs will support the following functions:

**A Biomolecule Production Core** will support the expression and purification of proteins, toxins, toxin subunits, antigenic peptides, carbohydrates, and other biologics in sufficient quantities for preclinical *in vitro* and *in vivo* studies.

**A Specimen Processing & Microbiology Core** will be used to identify the presence of infectious agents in tissue, cell culture, or environmental specimens.

**A Cell & Tissue Imaging Core** will be used to examine tissue, cell, and other biological specimens for research and diagnostic purposes, as well as to visualize molecules in living and fixed tissues, cells, and organisms in multiple dimensions.

**A General Clinical Research Center** will be used to study prevention and treatments for emerging infectious diseases.

**An Immunology Core** will offer basic cell separation services using magnetic separation and fluorescent activated cell sorting (FACS). Researchers will also be able to monitor the cytotoxicity of infected cell populations and study changes in surface antigen expressions in cells that have been infected by pathogens.

An Insectarium Core will offer containment levels 3 and 4 to support research on potential and known arthropod vectors associated with these infectious diseases.

An Aerobiology Core will allow researchers to study how infectious agents are transmitted by the aerosol route.

A High Throughput Screening Core will help researchers develop small molecule libraries of unprecedented complexity that they can use to identify therapeutic leads.

A Genomics/Microarray core will allow researchers to analyze global gene expression patterns and assess the regulation of response genes following infection, immunization, or challenge.

A Proteomics/Mass Spectrometry Core will contain state-of-the-art liquid chromatographic (LC) separation technology and allow for mass spectrometry analysis, including mass spectrometry sequencing and post-translational modification of proteins.

A Bioinformatics Core will support researchers in the development of high-throughput gene inference methods that can be applied to biological samples. It will also support the development of metabolomic, proteomic, and genomic fingerprinting.
natorial small molecule libraries. "There are now ways being researched, including here at BU, of taking a single molecule and then modifying little parts of it to create, say, 50 molecules that relate to that one core molecule. It's called combinatorial chemistry. These create large libraries of molecules. With this facility, you could take literally a million compounds and screen it very rapidly for an activity. So let's say you wanted to interfere with the replication of a particular microorganism, like a spore. You could screen an entire combinatorial library in this facility," says Klempner.

Because many infectious diseases are transmitted by insects, the facility will house an Insectarium Core. It will support research on arthropod vectors associated with human disease, such as mosquitoes and ticks, and will contain stereo zoom microscopes, as well as chill and downdraft tables. "Often there is an intermediate host in the transmission of diseases, and I believe there's a real opportunity to study the interface between the vector, the intermediate host, and the human," says Klempner. "So we're going to spend, I hope, a fair amount of time investigating the relationship of the vector and the intermediate host. It may be possible to interrupt the whole transmission cycle by researching how we can make the intermediate host immune from that transmission."

In addition to advancing research, the NEIDL will also act as a training facility, educating first responders and fire, police, and medical personnel about how to handle exposure to infectious agents. To do that, it will include a BSL-4 training simulator located outside of the containment area but identical to a BSL-4 environment. Here responders and researchers will learn how to work in such a lab as well as practice emergency responses to various situations.

In the event of a national emergency the facility would work with the government to help in meeting the crisis. "Our mandate as an NBL in the event of a national emergency is to supplement what is the existing plan for response," Klempner explains. "For example, if the CDC were overwhelmed with checking specimens from a potential environmental release, as was the case with the anthrax letters, where they had thousands of specimens, I think this laboratory would suddenly change its priority to devote its attention for that period of time to be a supplementary lab to other government facilities.

"In addition, we will have one of the greatest collections of intellectual expertise on emerging and re-emerging infectious diseases and bioterror agents," says Klempner. "We will actually be right on that front line. So if there's a question—a patient shows up with certain symptoms, for example, and there's a question of whether we should quarantine a population, we will have the expertise right here, and we will assist the government by providing immediate advice."

Although the NEIDL's role in national security will take center stage, Klempner believes research on a wide variety of emerging infectious diseases, including those not categorized as top priority by the NIAID, eventually will be interwoven with its agenda. He also anticipates that a large number of spillover technologies from the advances made in this laboratory will positively affect research of more common infectious diseases, like the cold. "There is a relatively limited number of pathways that we can break down as host barriers. And by understanding them better, you can transmit those ideas into a better understanding of other infectious diseases," says Klempner. "And it's a yet poorly defined set of rules that govern how the immune response works to these infectious diseases. By better understanding them we'll better be able to devise vaccines and immunotherapies.

Klempner anticipates that a large number of spillover technologies from the advances made in this laboratory will positively affect research of more common infectious diseases, like the cold.

I really think there will be big spin-offs and major public health benefits."

Not only will the nation and society as a whole benefit from this work, Klempner adds, but BUMC and the city of Boston stand to gain from the development of this project. During the building phase, which is scheduled to begin sometime in 2005 and end in 2007, more than 1,300 construction jobs will be created. Klempner estimates another 660 jobs will result from the lab's operations. Over the next 20 years, approximately $1.3 billion will go into the building and operation of the NEIDL, about $180 million for construction, $10 to $20 million annually for operation, and $50 to $70 million annually from funded research.

Klempner believes the laboratory will attract more of the best and brightest researchers to BUMC. "This will shift the epicenter for some kinds of research to BUMC," he says, "and will help make it the best urban academic and treatment center in the world."
Q&A
with Mark Klempner and John Murphy

Although numerous people played a role in winning the National Institute of Allergy and Infectious Diseases (NIAID) award to build a National Biocontainment Laboratory (NBL) at Boston University Medical Center (BUMC), two were leaders in making it happen. Mark Klempner, MD, associate provost for research at Boston University School of Medicine (BUSM), was principal investigator of the grant and is now director of what will be named the National Emerging Infectious Diseases Laboratories (NEIDL). And John Murphy, PhD, associate director of BUSM’s graduate program in molecular medicine, was co-principal investigator of the grant and is now associate director of the NEIDL.

Klempner’s long-standing research on infectious diseases led him to pursue the project. He asked Murphy to work with him because of his background in bacterial toximology research and experience with biosafety level 4 (BSL-4) work. A BSL-4 lab, designed to contain the most lethal microorganisms, will play a major role in the NEIDL’s operations, allowing researchers to realize their mission of studying emerging and re-emerging infectious diseases with the aim of developing countermeasures.

Boston University Medicine talked to Klempner and Murphy about why such a facility is needed and why it is important.

BU Medicine: What made the government decide it needed the NBL?

Murphy: Following 9/11 and shortly after the anthrax incidents, the NIH (National Institutes of Health) put together a blue-ribbon panel. Its charge was to assess the capacity within the United States to conduct research on emerging and re-emerging infectious diseases. And so essentially this blue-ribbon panel found that the infrastructure we have is lacking in groups of investigators who are working on these organisms and lacking the kind of physical laboratory space that allows one to work with agents.

Klempner: Then in August of 2002 the NIH held an informal meeting on its upcoming biodefense program in which it outlined that there would likely be three components. One component would be Regional Centers of Excellence, which would be groups of scientists in various regions of the country collaborating to work on the major goals of category A agents [those most likely to be used for bioterrorism] and emerging infectious diseases. Some small facilities would support them,
which came to be known as Regional Biocontainment Laboratories. And then there was the third component, which we chose to apply for, which was the two National Biocontainment Labs. [Another NBL will be constructed at the University of Texas Medical Branch in Galveston.]

**BU Medicine:** What made you think BUMC would be best positioned for this?

**Klempner:** First, this project needed a big superstructure to oversee it, and it needed a superstructure that had a place to put a building—a physical location. We were developing BioSquare, a biomedical research park. Second, it needed to be tied to the ability to become a national resource in the event of an emergency, a first responder adjunct. Our institution has a long history of being a first responder. We have the busiest level 1 trauma care in the Boston area, and we work closely with the command center for the Boston Public Health commissioner and the emergency management systems. Third, there needed to be a strong tie to a large cohort of collaborating scientists. We have that within our own institutions, as well as others within the New England region.

**Murphy:** Mark recognized that the establishment of a national laboratory in the city of Boston with its surrounding expertise—not only the Harvard Regional Center of Excellence but also investigators at places like MIT and the BU Photonics Center—would really be a spectacular resource for the region and for the nation.

**BU Medicine:** So even though some people ask why would you put such a facility in an urban area, you're saying the fact that we're in Boston is key to this facility's success?

**Murphy:** Yes. Plus you need to be able to attract talent. This facility has the potential to be the premier infectious disease research facility in the world. That's a magnet. That's a magnet for people who are young, energetic, dedicated to learning. And it's an enormous responsibility to those of us who have been given the charge to build this facility. And it's a responsibility we're taking very seriously.

**BU Medicine:** What was the reaction of then Dean Aram Chobanian when you talked to him about the proposal?

**Klempner:** I think he was skeptical at first but at the same time excited by what appeared to be a good match and an interesting opportunity that would catapult the Medical Center into a premier leadership role in the nation in the area of infectious diseases research.

**BU Medicine:** On a more personal level, what are you most excited about in terms of where your research might go?

**Klempner:** Everything! From the specifics of my own research, I'm very interested in the interface between the vector and the intermediate host. I've spent a lot of time on vector-born diseases. I'm hopeful that I will continue to be able to develop a program to look at that interface.

I also have a particular interest in technology that can be used in sensors to detect microorganisms for rapid diagnosis. For example, some of the most difficult questions we face every day result from when we find a white spot on a chest X-ray. Is that pneumonia, an infectious disease, excess fluid, or a blockage because of a pulmonary embolism? To have a rapid sensing method to take a droplet of sputum and say that patient has pneumonia would be a huge step forward.

But the overarching thing for me personally is this is a dream come true. I come from a background of basic science being translated into clinical science. And when I sat down to devise and design the program that was going in the facility, the guiding principle to me was “what will you need at each step of the development piece to get usable products that help the American public?” You know, you don't get to do that often in your career.

**Murphy:** This lab will allow us to go into new areas, and with creativity, hard work, and some good luck we hopefully will come up with new approaches to treat emerging and re-emerging infectious diseases in a way that we haven't been able to do. And we will be able to do this because we will have the physical containment necessary to work under and the great safety that protects the investigators.

Back when I worked in a level 4 lab, I worked on genetically re-engineering diphtheria toxin. That work resulted in a whole new class of therapies, and the first drug was approved by the FDA four years ago. It's being marketed under the name Ontak and is used to treat cancer patients. Recent studies show the drug is working. In one study, 7 of 22 patients had complete resolution. Complete—these patients would've died. And 9 had partial response. This is a drug that was developed under biosafety level 4 initially.

That's why I do what I do. It's not to make money. It is to try and do good.
A Novel System Helps Mentor Students

The Academies of Advisors, a new mentoring program, aims to provide students with not only advice, but also role models.
Medical school is tough—academically and personally. Students face packed schedules, demanding classes, and difficult career decisions.

For years, faculty advisors have provided students with the chance to talk to someone who knows the ropes and can help them navigate their way. But unfortunately, not all students took advantage of this system. "Some students were getting wonderful advising, but we also had students who just weren't getting the advice they needed," says Phyllis Carr, MD, associate professor of medicine and associate dean for Student Affairs. "In general, students who were more assertive in getting their needs met had a better experience."

To rectify this problem, Carr devised a new mentoring system called the Academies of Advisors that began with the class of 2007. The mandatory program ensures that students meet with their advisors several times a semester on both an academic and personal basis. While improving the advising, the program also aims to promote professional, ethical, and humanitarian values by exposing students to the School's best educators and role models.

"This is meant to even the playing field a bit for our students and give them a lot of input regarding their medical careers," says Carr. "There are all kinds of things you can do with a medical degree, and all kinds of avenues are being opened up to these students while they are here. But they're so busy with their studies, they sometimes don't have time to pursue them. They don't have time to figure out who they should talk to about things. Having one person who knows the School well, who knows the possibilities in medicine, who they meet with on a regular basis, if only to say 'I think this is interesting. How can I find out more?'—it gives students the ability to maximize their education."

The Academies of Advisors—composed of six academies—facilitates smaller group activities within the medical school. Six deans from the Office of Student Affairs, Office of Academic Affairs, and the Admissions Office serve as the heads of each academy. In addition each academy also has a basic scientist, a surgeon, a primary care physician, and a specialist. All of these faculty members serve as core advisors, with each currently handling about five students. (After all four years are included, advisors will mentor approximately 20 students each.)

To choose participating faculty, Carr with the help of the Academies Committee and Ana Bediako, director of the program, conducted an extensive search. They asked students who they thought were the best teachers and advisors, and they asked faculty the same questions. "We basically picked our best teachers and mentors to be part of these academies," says Carr.

In addition to these core advisors, there also are at-large advisors who include senior staff and junior faculty, as well as potential future replacements for the core advisory positions. This staff assists the core advisors and attends many of the functions. "It's sort of a conglomerate," says Carr. "It includes people who we thought were really valuable but wouldn't be around 12 months a year to be available to students and other faculty whose work demands do not permit their full integration as core academy members."

When students enter their third year and select a specialty, they will also work with field-specific advisors who will help them learn about their specialties. These advisors will help students with the application processes for internships and residencies as well. Additionally, student volunteers within the same academy will serve as peer advisors to students one year behind them. While the peer advising system has been operational for some years, having this function within the Academies will increase the interclass connections and further strengthen the structure. "A lot of thought and effort went into the design of this program to make it unique to BU," says Carr.

The actual program consists of several elements. During the academic year, students meet twice a semester with their advisors in one-on-one meetings. (Students can request an appointment with their advisors any time they may need help.) These meetings give students a chance to ask questions, and advisors can offer assistance to anyone who might be struggling academically.
Advisors also host two informal dinners per year for their advisees. To further increase faculty and student interactions, social events are held throughout the year that include either all of the academies or groups of the academies.

"We want to promote greater interaction outside of the classroom in the hopes it will lead to informal discussions and mentoring, acculturation to the profession, and exposure to some of our best role models," says Carr. "We want to help students acquire the professionalism we know they'll need."

As part of her academy's planned events, Carr hosted a brunch at the beginning of the year. Carr's advisees attended, as well as the at-large advisors who work with her. "It allowed students to meet each other, but also people from different disciplines," she says.

Chi-Chi Adimora and John Scolaro, both of whom have Carr as an advisor, agree that the event was beneficial to students. "It was a great day, just getting to know the advisors outside of school," says Scolaro. "It sounds kind of cliché, but I think it's important because it makes that person more approachable once you're in school. I wouldn't feel intimidated to go to Dr. Carr's office if I needed something, because from the very beginning I was able to create a relationship that was at least somewhat comfortable for myself."

Adimora feels the same. "I think it's good right from the beginning to get to know a professional who you can talk to and ask questions," she says.

Sohini Shah, who came to the School of Medicine through the Boston University (BU) MMEDIC program (early acceptance into medical school for BU students), says her advisor, Paul O'Bryan, PhD, professor of physiology and biophysics and assistant dean for Student Affairs, took her group to lunch. "It was still summerish out so we were able to eat outside by the water. It was really nice. It was very informal chatting—a lot of questions about med school, obviously, because nobody knew what to expect. But then there was also just general talking and getting to know each other," she says.

Shah's father owns a business and her mother works as a biotechnology researcher, making Shah the first in her family to go to medical school. Down the road, she foresees talking to her advisor about how to navigate medical school and for career advice. "I'm sure I'll talk about taking the board exams and applying for residencies and choosing elective rotations. That is what I'm going to need help with, because I don't know anybody who I can ask about that stuff," she says.

Getting advice is a top priority for Adimora and Scolaro, too. Adimora, for example, says she needs help planning her summer. She is participating in the U.S. Army Health Professions
Scholarship Program, which pays for medical school in return for serving as an Army doctor for a certain length of time (dependent on the years of the scholarship). "I have to go to boot camp for six weeks this summer, but I want to do something with the rest of the four weeks I have left," says Adimora. "I don't know exactly what would be available, because most programs usually run six to ten weeks."

Scolaro also wants to ask Carr for advice on how to spend some upcoming free time. He entered the medical school after attending the BU Master's in Medical Sciences program, during which he took several medical school courses. As a result, his course load next semester will be a little lighter. "I'm wondering if I should be doing more clinical stuff, like shadowing a doctor or being involved in some clinical research. Or if I should go back to the lab where I worked during grad school. Or should I use the time to get involved with a volunteer program outside of med school," says Scolaro.

"Residency positions are all competitive. You want to make the right moves at each step of the way," he adds. "So that's one thing I'll really be relying on Dr. Carr for, because you get different opinions from different people. But she's someone who has written Dean's letters for many years and has dealt with people who are applying to residency programs and knows the workings of medical schools and hospitals. She'll be a pretty straight shooter at telling me what the best thing is for me to do."

Although the program is still new and may encounter a few kinks as it continues to develop, Carr believes it's off to a good start. The students have been enthusiastic, she says, and actually have requested more events. Participating professors have responded equally well. "It's been really gratifying to have professors who've been here for years come up to me and say 'this is wonderful,'" says Carr. "It draws them into the experience of our students. And that's a very good thing, because you know sometimes we forget how hard medical school has become, how much information and knowledge there is to acquire, and how stressful it is for students. It makes us all much more of a community, being involved together in this."
Campus Growth

The Boston University Medical Center campus is continually expanding. Here are some of the works in progress.

Renovations to the front entrance and lobby of the Yawkey Ambulatory Care Center are under way.
Groundbreaking will commence this spring on the J. Joseph Moakley Medical Service Building at BMC. Once complete, the facility will consolidate cancer care for patients and allow the Medical Center to expand care. It is expected to be completed in the summer of 2006.

In 2005, construction on the $128 million National Emerging Infectious Diseases Laboratories will begin. The 223,000-square-foot building will house some of the most sophisticated labs in the world for the study of infectious diseases. The project is expected to wrap up in 2007.

An aboveground parking garage is being built concurrently with the third BioSquare laboratory. It’s expected to be completed in August 2005.

Construction is under way on the third BioSquare laboratory building. Located at 670 Albany St., the 176,000-square-foot facility should be completed in August 2005.
The recently established Center for Biomedical Imaging gives BU investigators access to a high-powered magnetic resonance imaging (MRI) scanner that’s devoted to research.
While it could be argued that mapping of the human genome will prove to be one of the most important research-related developments in history, a similar argument could be made for the invention of magnetic resonance imaging (MRI). This noninvasive diagnostic machine produces two- and three-dimensional computerized images, giving doctors and researchers the ability to look inside a living body without the use of radiology or surgical tools.

Boston University (BU) investigators on both the medical school and Charles River campuses have been employing MRI as part of their research for more than a decade, but they’ve had to go outside and use other facilities’ equipment. Not only did they often receive less-than-desirable time slots to conduct their research, sometimes as late as 2 a.m., but they also had little control over the MRI scanner and their data.

With the opening of BU’s Center for Biomedical Imaging, all of that changes. This new facility, located in the Evans Biomedical Research Center in BioSquare on the medical campus, gives investigators access to the first high-field, wide-bore MRI scanner dedicated to research at BU. Although any investigator can pay to use the facility, BU researchers will have preference and pay a lower fee.

“We would like the center to be a focal point for any research project on campus that involves MRI,” says Dae-Shik Kim, PhD, director of the center and Boston University School of Medicine (BUSM) associate professor of anatomy and neurobiology. Kim, who came to BUSM from the University of Minnesota, specializes in neuroimaging and is known nationally for his work in a technique called functional MRI.

According to Kim, funded research will take preference over nonfunded. However, the center is setting aside about 20 to 25 percent of the time slots for nonfunded pilot studies to be chosen by a committee and based on merit. “We have to leave room for the people who are not funded so they can get preliminary data and receive funding,” says Kim.

The center provides researchers with state-of-the-art equipment, starting with a 3-tesla MRI scanner from Philips. A tesla is a unit of magnetic flux density; the higher the tesla, the stronger the magnet. “Think of it this way—a tesla is 10,000 gauss; and the natural magnetic field of the earth is somewhere around 0.5 to 1 gauss,” explains Kim. “The magnet in this Philips machine is 30,000 gauss, which means it’s about 30,000 times stronger than the earth’s natural magnetic field.”

Researchers in many areas of basic and clinical sciences, particularly neurosciences and cardiac imaging, are turning to high-field MRI scans because of the greater resolution and detail they provide, notes Kim. “This is a major trend for scientists,” he says.

Going even further, the center offers researchers the opportunity to control their own MRI scans and to program the scanner by providing free training. To start, everyone must take safety training. “That’s simply because we are dealing with a high-field magnet, and we want to make sure nothing goes wrong,” says Kim.

Some users will simply want to monitor their scans, notes Kim, employing the center’s technicians. However, those who want to operate the scanner can do so under the supervision of the center’s technicians after undergoing training. If researchers go through additional training, they can operate the MRI scanner on their own.

At the highest level of training, researchers can learn how to program the MRI scanner. “This is a great opportunity for research. Normally, you are limited to only the set of programs or techniques that the vendor thinks would be relevant to your research,” says Kim. “But we have a research agreement with Philips, so we are allowed to reprogram the scanner. That, of course, is the meaning of a true research scanner. We can start to develop novel techniques and modalities.”

The powerful 3-tesla magnet is also well suited for what is known as functional MRI (fMRI). This allows researchers to capture the action—or function—of an organ by tracking changes in the level of oxygen in the blood. Kim explains how an fMRI of the brain works as an example of this technique. When the brain is stimulated, neurons respond and consume energy, he says, using oxygen from the bloodstream as fuel. The bloodstream transports oxygen via a molecule called hemoglobin. A hemoglobin molecule with oxygen still attached is called oxyhemoglobin; after the oxygen has been transferred to the cell it’s called deoxyhemoglobin. These two hemoglobin types

Dae-Shik Kim, PhD, nationally recognized for his work in functional MRI, came to BU to run the new Center for Biomedical Imaging.
possess different magnetic properties. "When the brain is stimulated the neurons become more active and need more oxygen. You will see only in the area where the neurons are more active an increase in MRI signals," says Kim. "So you do a lot of computational statistics, and you get many nice images on screen."

Neuroscientists pioneered fMRI in the early 1990s, says Kim, but other researchers are devising ways to employ this technique. Yet another recently developed modality using MRI, called Diffusion Tensor Imaging (DTI), allows researchers to see connections between neurons in the brain. "So now you can study brain connectivity using MRI, which is actually quite amazing," says Kim.

To support investigators' work, the center includes a mock MRI scanner for training subjects and helping them become familiar with the process before undergoing the actual MRI. "The process can be kind of intimidating," says Kim. "You're not supposed to move. Plus the machine is very loud. So this gives researchers a chance to get their subjects used to it before spending all kinds of money on the actual MRI."

A preparation room provides space for anesthetizing and other prep work. In an equipment room, a waveguide tube connects to the adjoining room with the MRI scanner, allowing for video stimulation of subjects, often a critical part of fMRI research. (The MRI scanner would disrupt the video equipment operation if it were in the same room, notes Kim.) Once they've collected their data, researchers can analyze it in the center's computer room. Eventually, the center would like to provide an EKG connection to the scanner for cardiology research, adds Kim.

Kim hopes investigators will come in with their questions and work collaboratively with the center toward solutions. He says one of his most prominent research projects is to develop paradigms for longitudinal studies, which use serial MRI scans to follow how a disease develops. "This is a major new line of research," says Kim. "For the most part investigators have been using one-time scans of subjects to develop their scientific hypotheses and interpretations. Investigators will take other MRIs at certain points in the subject's life, but the scans are often years apart."

Kim believes a better conceptual framework exists for studying certain diseases. "For example, if you are interested in Alzheimer's, it's clear that there's not a single time point that is most relevant, but rather what is relevant is to follow with multiple scans how this phenomenon develops throughout many months and, in some cases, years. The disease itself is a collection of this long-time period of progression or degeneration that actually builds up or makes this case," says Kim. "The longitudinal studies or multiple scans of the same subject is something done in a very systematic way, in my opinion, not only in terms of anatomical changes but in terms of functional changes and connectivity changes."

He also sees potential for longitudinal studies in the area of autism. "We could follow the development of the same autistic child starting very early on and follow up for months and years to see how his functional properties develop. How do the neurons develop their connections, for example? What is different in the subject?"

The possibilities, says Kim, are endless. "This is an amazing machine," he says. "I consider it to be one of the more complicated and fascinating medical devices around. There's a good reason why the Nobel committee decided to award the 2003 prize in medicine for major discoveries in MRI. Who knows what we'll discover? That's what makes it very exciting."
New Appointments

EDWARD FEINBERG
Chair of Ophthalmology

Edward Feinberg, MD, was recently appointed chairman of the Department of Ophthalmology at Boston University School of Medicine (BUSM) and chief of the Division of Ophthalmology at Boston Medical Center (BMC). He served as acting chairman and chief since July 2002.

Feinberg, who specializes in diseases and surgery of the retina, has also recently served as associate director of Resident Education for the Department of Ophthalmology at BUSM and clinical services director for Ophthalmology at BMC.

After receiving his medical degree from Mount Sinai School of Medicine in 1971, Feinberg completed an internship in internal medicine followed by a residency in ophthalmology and a fellowship in retina disease and surgery at the University of Michigan. For 19 years he combined private practice with service as a faculty member at the University of Tennessee College of Medicine Clinical Education Center, Chattanooga, where he was associate professor of ophthalmology. He also held the positions of director of the Retina Service, residency program head, and department chairman.

The American Board of Ophthalmology and a member of several professional organizations, including the American Academy of Ophthalmology and the New England Ophthalmological Society. He has published numerous journal articles and received resident teaching awards at BUMC, the Massachusetts Eye and Ear Infirmary, and the University of Tennessee. He is also the recipient of the American Diabetes Association Physician's Award of Excellence and the Lions Club Humanitarian Service Award.

ALEXANDER NORBASH
Chair of Radiology

Alexander Norbash, MD, was appointed chairman of the Department of Radiology at BUSM and chief of Radiology at BMC.

His research interests have concentrated on neurointerventional tool development for the treatment of vascular disorders of the brain and spinal cord, specifically focusing on aneurysms, stroke, and the treatment of atherosclerotic disorders.

Previously Norbash was director of Diagnostic and Interventional Neuroradiology at Boston's Brigham and Women's Hospital and was an associate professor at Harvard University School of Medicine. He is the founding director of the Interventional Neuroradiology and Endovascular Neurosurgery Divisions of the Brigham and Women's Hospital and was formerly an interventional neuroradiologist at Massachusetts General Hospital (MGH).

Prior to his appointments at MGH, Norbash was an interventional and diagnostic neuroradiologist, director of Head and Neck Imaging, and director of Neuro-Magnetic Resonance Therapy at Stanford University Hospital from 1994 to 1998.

Norbash received his medical degree from the University of Missouri-Kansas City. He performed his radiology residency at Saint Francis Medical Center and the University of Pittsburgh. At Stanford University Hospital, Norbash served as a fellow in diagnostic neuroradiology and interventional neuroradiology.

He has lectured nationally and internationally, authored hundreds of presentations and articles, and has published extensively. He belongs to many professional organizations, including Alpha Omega Alpha, the Radiological Society of North America, and the American Stroke Association. Additionally, Norbash has developed clinical products that are currently used to treat vascular disorders of the head, neck, and spine.
Steven Williams, MD, has been appointed chairman ad interim of the Department of Rehabilitation Medicine at BUSM and chief ad interim of Rehabilitation Services at BMC. He had been acting chairman and chief prior to this appointment.

Williams received his medical degree from the Eastern Virginia Medical School. He performed his residency at Boston University School of Medicine and the Rusk Institute for Rehabilitation Medicine at New York University. He is a member of numerous professional organizations, including the American Academy of Physical Medicine & Rehabilitation, the American Spinal Injury Association, and the American Paraplegia Society. He also has authored many publications and abstracts and delivered numerous lectures and other presentations.

In 1997, Williams received the American Medical Association/Claxo-Wellcome National Resident Award for both outstanding community service and leadership. He is founder of Coats for Kids and has made several medical missions to Kenya as part of Operation Smile International. He also is the founder of Friends of the New England Regional Spinal Cord Injury Association.

Boston University School of Medicine's (BUSM) Department of Anatomy and Neurobiology, led by Mark Moss, PhD, professor of anatomy and neurobiology, has been selected as a partner in the Carnegie Initiative on the Doctorate, a multiyear research and action project aimed at improving doctoral education in American universities. The department is one of 51 partner sites selected throughout the country to analyze their doctoral programs and create design experiments with the aim of improving doctoral education. Of those 51 sites, nine are focusing on neuroscience.

Karen Freund, MD, MPH, professor of medicine at BUSM, and chief of the Women’s Health Unit and director of the Center of Excellence in Women’s Health at Boston Medical Center (BMC), is one of 45 senior women faculty from medical and dental schools to have been selected as 2003-2004 fellows by the Hedwig van Ameringen Executive Leadership in Academic Medicine (FLAM) Program for Women. ELAM is the only in-depth national program that prepares senior women faculty for leadership positions at academic health centers.

Haralambos Gavras, MD, professor of medicine at BUSM and chief of the Hypertension and Atherosclerosis Section at BMC, won the International Society of Hypertension’s 2004 Franz Volhard Award for his research on the renin-angiotensin system, as well as clinical and experimental hypertension. Given every two years, the award is the highest honor bestowed by the society.

Leonard Gottlieb, MD, MPH, chairman emeritus of the Department of Pathology and Laboratory Medicine at BUSM, was recently honored at a ceremony dedicating the Leonard S. Gottlieb Conference Room at Boston University Medical Center (BUMC). Gottlieb, who also was the former director of the Mallory Institute of Pathology at BMC, served BUSM and BMC and its predecessors for 50 years.

Maureen Kavanah, MD, associate professor of surgery at BUSM and surgical oncologist at BMC, has been appointed to the Central Institutional Review Board of the National Cancer Institute for three years.

Joseph Korn, MD, Alan S. Cohen Professor of Medicine in Rheumatology and director of the Arthritis Center at BUSM, was recently honored at the inaugural Gala of the Scleroderma Foundation for his achievements and his commitment to scleroderma research. Korn, chief of Rheumatology at BMC, received a special copy of the Congressional Record of October 28, 2003, in which U.S. Rep. Stephen Lynch summarized Korn’s dedication and contributions to scleroderma research and patients afflicted with the disease.
Ewa Kuligowska, MD, professor of radiology at BUSM and chief, Ultrasound Section, Division of Radiology at BMC, has been elected president of the American Association for Women Radiologists for 2004. The association, founded in 1981, currently has more than 1,500 members, as well as additional international chapters.

Joseph Loscalzo, MD, PhD, Wade Professor, chairman of the Department of Medicine at BUSM, and director of the Whitaker Cardiovascular Institute, was named editor of the scientific journal *Circulation: Journal of the American Heart Association*. His appointment becomes effective July 2004 when the current editor's term ends. Loscalzo has served on the editorial boards of several of the association's journals, including *Hypertension, Circulation Research, Circulation, and Atherosclerosis, Thrombosis, and Vascular Biology*. He also serves as physician-in-chief of the Division of Medicine and president of the Evans Medical Foundation for BMC.

NitroMed, a pharmaceutical company developing nitric oxide enhancing medicines, and BUSM recently formed a multi-year research collaboration to support basic research into the clinical and pharmacologic roles of nitric oxide. To support this research NitroMed, which is headquartered in Bedford, Mass., opened a second research facility in BU's BioSquare. Joseph Loscalzo, MD, PhD, Wade Professor, chairman of the Department of Medicine at BUSM, and director of the Whitaker Cardiovascular Institute, is NitroMed's scientific founder.

Janet Osterman, MD, assistant professor of psychiatry at BUSM and psychiatrist at BMC, has been named distinguished fellow by the American Psychiatric Association. Osterman, who specializes in post-traumatic stress disorder, received the honor in recognition of her significant contributions to psychiatry.

Stephen Pelton, MD, professor of pediatrics at BUSM, chief of Pediatric Infectious Diseases at BMC, and professor of epidemiology at BU's School of Public Health, has been elected president of the Massachusetts Infectious Diseases Society. His two-year term began July 1, 2003.

Harilaos Sakellarides, MD, assistant clinical professor of orthopedic surgery at BUSM, has been named a fellow of the Royal College of Physicians and Surgeons and recently became a member of the American Academy of Minimally Invasive Spinal Medicine and Surgery.

Richard Shemin, MD, professor and chairman of Cardiothoracic Surgery at BUSM, and chief of Cardiothoracic Surgery and vice chairman of the Division of Surgery at BMC, has been appointed president-elect of the Northeast Affiliate, Greater Boston Division of the American Heart Association. Shemin's term will run through July 2005.

Elizabeth Simons, PhD, professor of biochemistry at BUSM and assistant director for basic sciences in the Office of Medical Education, received the Gano Dunn Award for professional achievement in science and engineering this spring from her alma mater Cooper Union in New York City. Simons is only the second woman to receive the award, which was instituted in 1955.

Alfred Tauber, MD, professor of medicine, pathology, and laboratory medicine at BUSM, and professor of philosophy and director of the Center for Philosophy and History of Science at BU, has been named the first Zoltan Kohn Professor of Medicine. Tauber joined the BU faculty in 1982, when he became chief of the Hematology and Oncology Service at the former Boston City Hospital. He led that section for 13 years while also making important scientific contributions to the field of inflammation and the cell biology of leukocytes, the white blood cells instrumental in fighting infection.

At the same time, Tauber cultivated his interests in the history of immunology, bioethics, and the philosophy of science. In 1993, he accepted a formal appointment in the Department of Philosophy at BU's College of Arts and Sciences, where he currently instructs graduate and undergraduate students. He has published extensively on 19th- and 20th-century biomedical and biomed- ical ethics, including *Confessions of a Medicine Man, An Essay in Popular Philosophy* (MIT, 1999). Tauber also teaches ethics at BUSM, is a member of the Hematology-Oncology Section at BMC, and is a member of BUSM's Board of Visitors.
Trust to Benefit Neurosciences

Jack Spivack, a Washington, D.C. resident and long-time member of Boston University School of Medicine's (BUSM) Board of Visitors, established an irrevocable trust that upon maturation will donate $7 million to BUSM to name the Spivack Center for Behavioral Neurosciences. Behavioral Neuroscience represents a major growth area in biomedical sciences, and Spivack's generous gift will position BUSM as one of the world's premier centers. Spivack became involved with BUSM when a close relative and first-year medical student experienced difficulty in adjusting to the new and challenging experience. Spivack appreciated the sensitive treatment his relative received and became a donor, supporting BUSM steadily ever since.

Annuity Created for Infectious Disease Research

Henry Wolfe, MD '45, and his wife, Grace, established the Henry and Grace Wolfe Scholarship Fund. Upon maturation, the $100,000 annuity will benefit students in the MD program at the School of Medicine or in the MD/PhD program in the Division of Graduate Medical Sciences. During his career Wolfe focused on infectious diseases, so preference will be given to students interested in this area of study. Wolfe hopes the scholarship will stimulate research in infectious diseases.

Professorship Honors Two

Nearly $1.3 million has been committed to establish the M. Stuart Strong and Charles W. Vaughan Professorship in Otolaryngology. M. Stuart Strong, MD, a former chairman of BUSM's Department of Otolaryngology, and Charles Vaughan, MD, worked together in the department for more than two decades, turning it into one of the best in the world. They were the first to use laser in otolaryngology surgery, for example, transforming the field and greatly improving the lives of patients. Numerous former residents and colleagues have contributed to the Department's initiative.

Gift Establishes New Lab

The Fannie E. Rippel Foundation invested $320,000 to create the Molecular Diagnostic Research Laboratory in BUSM's Department of Surgery. This project, directed by Peter Thomas, PhD, professor of surgery, partners surgeons and laboratory scientists in translational research that will benefit cancer patients as their probability for disease recurrence is identified, helping to individualize treatment.

Grant Aids Biomedical Engineering Initiative

BUSM received $1,025,000 from the Whitaker Foundation in support of the Whitaker Leadership Development Program in Biomedical Engineering, a multiyear interdisciplinary project conducted in partnership with BU's College of Engineering. Biomedical engineering uses cutting-edge techniques to understand how the body's processes and structure, from the level of individual genes to whole organs, relate to disease.

Donation to Benefit Alzheimer's Center

The Fidelity Foundation donated $150,000 to the BUSM Alzheimer's Disease Research Center. The center, which conducts clinical research and receives approximately 3,000 visits annually, is also supported by more than $11 million in funding from the National Institutes of Health and the Alzheimer's Association.

Grant Supports Study of Elderly Health Care

Sharon Levine, MD, associate professor of medicine at BUSM and geriatrician at Boston Medical Center (BMC), received a grant for nearly $2 million from the Donald W. Reynolds Foundation. The grant is one of ten awarded by the foundation's Aging and Quality of Life program, an initiative designed to improve the quality of health care for elders throughout the United States by training physicians to address elders' special needs.

22 BOSTON UNIVERSITY MEDICINE
health-care needs. The grant funding supports the establishment of the Boston University Medical Center Comprehensive Geriatric Education Project. This four-year geriatrics education initiative at BUSM, BMC, and the affiliated Boston Neighborhood Health Center Network will strengthen the training of medical students, residents, faculty, and practicing physicians in geriatrics.

Two Researchers Receive Grants
Philip Morris provided Wandi Li, PhD, associate research professor, with continuation funding of $368,600 for his study "Mechanisms of Perturbation of Pulmonary Lysyl Oxidase by Cigarette Smoke" and Victoria Herrera, MD, associate professor of medicine, with $399,358 for her study "Integrated Molecular Analysis of Nicotine-Hypertension-Hyperlipidemia Interaction in CHD."

BUSM to Lead New Consortium
Peter Merkel, MD, MPH, assistant professor of medicine at BUSM, will be the director and principal investigator of a new multicenter Vasculitis Clinical Research Consortium (VCRC). Funded by a five-year, $6.25 million grant from the National Institutes of Health, the VCRC will focus on investigations in the inflammatory vasculitides, rare diseases linked to inflammation of the blood vessels. BUSM will serve as the lead medical center in the consortium; the other centers include the Cleveland Clinic, Johns Hopkins University, and the Mayo Clinic, as well as centers in Canada, France, and Germany.

BUSM Affiliate Wins NIH Grant
The Roger Williams Medical Center in Providence, R.I., a clinical affiliate of BUSM, was awarded a five-year, $13 million grant from the National Institutes of Health (NIH) to further its studies into adult stem cells. The grant comes from the NIH's Center of Biomedical Research Excellence program, which aims to help research centers nurture junior scientists, build new labs, and buy new equipment. Peter Quesenberry, MD, chairman of Roger Williams' Department of Research and head of the Center for Stem Cell Biology, is the principal investigator for the grant.

Prostate Cancer Research Funded
Douglas Faller, MD, PhD, professor of medicine at BUSM and vice chairman of the Section of Hematology/Oncology at BMC, has received a $600,000 grant from the Prostate Cancer Research Program of the U.S. Department of Defense's U.S. Army Medical Research and Materiel Command. Faller's research project is titled "Sensitization of Prostate Tumors to Retinoids by Short-Chain Fatty Acids."

Researcher Receives $2 Million Grant
The National Heart, Lung, and Blood Institute has provided Noyan Gokce, MD, assistant professor of medicine at BUSM and staff cardiologist at BMC, with a five-year, $2 million grant to study the therapeutic effects of different modalities of weight loss on vascular function and adipocyte metabolism.

NIH Grant Provides Ongoing Support
Bertram Payne, PhD, professor of anatomy and neurobiology at BUSM, has received a $2.7 million grant from the National Institutes of Neurological Diseases and Stroke, a division of the National Institutes of Health (NIH). The five-year award will help Payne and his researchers study "Rehabilitation of Neural Spatial Neglect." The new funds add to the more than $3 million of support that Payne has received from the NIH for ongoing research.
Alumni Awards

The Boston University School of Medicine (BUSM) Alumni Association annually confers two types of awards on alumni. Its Distinguished Alumnus/Alumna Award recognizes outstanding clinical, teaching, and research careers, and its Humanitarian Award acknowledges graduates who have made a significant contribution to the betterment of society.

**Distinguished Alumnus Awards**

**Philip Barie, MD ’77**

Philip Barie, MD ’77, is professor of surgery and public health at the Joan and Sanford I. Weill Medical College of Cornell University; chief of the Division of Critical Care and Trauma and chief of the Preston A. Wade Surgical Service at New York-Presbyterian Hospital; and director of the Anne and Max Cohen Surgical Intensive Care Unit of New York-Presbyterian Hospital.

A nationally recognized expert in surgical critical care and trauma, Barie’s research focuses on the pathophysiology of acute respiratory failure, systemic responses in ischemia-reperfusion injury, the epidemiology of critical surgical illness, and the epidemiology of multiple organ dysfunction syndrome. He has published more than 400 articles, manuscripts, and abstracts, and his book *Surgical Intensive Care* has been recognized as one of the best health-science books and received the Best New Book: Medical Science award from the Association of American Publishers Professional and Scholarly Publishing Division.

Barie has been listed in *Who’s Who in Medicine and Health Care, Who’s Who in the World,* and *Who’s Who in America.* He is president of the Eastern Association for the Surgery of Trauma and president of the Surgical Infection Society, and he has served as president of the New York State Society of Surgeons. He is a fellow of the American College of Critical Care Medicine and a fellow of the American College of Surgeons. Additionally, he is editor of *Surgical Infections* and is on the editorial board of the *Journal of Trauma and Critical Care Medicine.*

In 2003, he received his MBA degree from Auburn University Lowder School of Business.

**David Faxon, MD ’71**

David Faxon, MD ’71, is professor of medicine and chief of the Section of Cardiology at the University of Chicago. A world-renowned specialist in interventional cardiology, Faxon helped pioneer the development of angioplasty. With more than 370 publications and four books to his credit, he is best known for his research on the mecha-
nisms and prevention of restenosis after angioplasty.

Faxon was a member of the BUSM faculty from 1976 to 1993, serving as director of the Cardiac Catheterization Laboratory and associate director of cardiology at University Hospital (now Boston Medical Center). In 1993, he joined the faculty of the University of Southern California (USC) Medical School as professor of medicine and chief of the Division of Cardiology at the Los Angeles County+USC Medical Center and USC University Hospital.

His current research includes the role of collagen metabolism in vascular remodeling, cytokines in restenosis, the role of local drug delivery, and intravascular radiation in the prevention of restenosis, as well as participation in a number of multicity clinical trials in the area of interventional cardiology and acute coronary syndromes. In addition, he patented a catheter for delivery of therapeutic and diagnostic agents to the tissue surrounding a body passageway.

He is regularly included on lists of the best cardiologists in the United States. He is president of the American Heart Association and a past president of the Society for Cardiac Angiography and Interventions. He also serves on the editorial boards of a number of journals, including Circulation, the American Journal of Cardiology, and the Journal of the American College of Cardiology.

Carolann Najarian, MD '80, is president of the Armenian Health Alliance, a nonprofit organization she helped found in response to the 1988 earthquake that devastated northern Armenia.

Najarian has made more than 50 trips to the Republic of Armenia and to the Nagorno Karabakh Republic to assess the medical needs in these regions and to deliver millions of dollars worth of assistance to villages, maternity and pediatric hospitals, and orphans and refugees. In 1994, Najarian founded the Primary Care Center of Gyumri, the city most devastated by the earthquake. With the financial support of the Armenian Health Alliance, primary care doctors and nurses provide care and medicine free of charge to more than 400 patients a month, most of whom are indigent and elderly. The Alliance also supports the Huys Orphanage in Gyumri.

In 1995, Najarian founded the Arpen Center for Expectant Mothers in the city of Stepanakert, the capital of Nagorno Karabakh. The center provides monthly assistance of food, vitamins, clothing, and other basic necessities to pregnant women. It also distributes information on pregnancy, good health, and diet. Approximately 7,000 women have been served by the Arpen Center, and nearly 700 women come to the center each month. Najarian spends about three months each year in Armenia and Karabakh supervising these projects, teaching, and consulting with patients. She also has written the book A Call From Home; Armenia and Karabagh, My Journal, which documents her experiences during nearly a decade of humanitarian work in the region.

Najarian is a diplomate of the American Board of Internal Medicine and has been a practicing internist in the Cambridge and Watertown, Mass. area. She is assistant medical director of Middlesex County Hospital, a member of the medical staff of St. Elizabeth's Medical Center and of Mount Auburn Hospital, and an instructor in clinical medicine at Harvard Medical School. After years in private practice, Najarian left active medical practice to volunteer full time as president of the Armenian Health Alliance. The recipient of numerous awards, she was presented with the Ellis Island Medal of Honor in 1999.
In Memoriam

Norman Levinsky, MD, of Newton, Mass., on March 8, 2004, at the age of 74. Dr. Levinsky was known for his intellect, his outstanding teaching abilities, and his rigorous standard of medical ethics.

He was a leader at Boston University Medical Center (BUMC), spending more than 40 years here. He served as chief of Renal Section in the Department of Medicine at Boston University School of Medicine (BUSM) from 1967 to 1968 and then 1971 to 1987, and as chairman of the Department of Medicine from 1972 to 1997, making him one of the longest-serving chairs of an academic medical department in the nation. In 1997, Dr. Levinsky stepped down to become associate provost at Boston University Medical Campus, and was recently named acting provost of the Medical Campus.

Dr. Levinsky graduated from Harvard Medical School and completed his residency at Beth Israel Hospital in Boston. After his residency, he was a clinical associate at the National Heart Institute and then became a fellow in medicine at BUMC.

“He was a brilliant administrator who led Boston University’s and Boston Medical Center’s Department of Medicine and the Evans Medical Foundation for a remarkable 25 years,” says Aram Chobanian, MD, president ad interim, Boston University, and a colleague of Dr. Levinsky for more than 40 years. “I always gave Norman the toughest problems to deal with, knowing full well that he would accomplish the task in his typically thoughtful, meticulous, and creative manner.”

During his career Dr. Levinsky authored more than 150 publications on subjects ranging from kidney function and renal disease to health policy ethics and education. He also was a member of many renowned academic societies, including the Institute of Medicine of the National Academy of Sciences, the American Society for Clinical Investigation, the Association of American Physicians, and the Association of Professors of Medicine. He chaired two national committees of the Institute of Medicine, including the Committee to Study End-Stage Renal Disease Program and the Committee on Xenograft Transplantation: Science, Ethics, and Public Policy. Each report influenced federal regulations in their respective areas. Until recently, he also directed a kidney research laboratory for which he received 30 continuous years of funding from the National Institutes of Health.

“Dr. Levinsky built the department into one of the best in the country with the recruitment of many outstanding academicians,” says BUSM Acting Dean John McCahan.

Respected as an outstanding teacher as well, Dr. Levinsky’s renal rounds were legendary. His teaching earned him numerous accolades and awards, including the prestigious Distinguished Teacher Award for the American College of Physicians, as well as recognition as an Outstanding Faculty Member by BUSM students and Teacher of the Year by the medical residents. Additionally, every year he met with each House Officer on an individual basis to provide advice and counsel.

“I enjoy teaching enormously,” Dr. Levinsky said in a recent interview. “I love interacting with the students, the trainees, and the residents. They bring fresh, new ideas and have interesting viewpoints on every issue. I have reached the stage where the children of some of my first students are here at the School or in the residency program. It is gratifying to see that.”

As a champion of patients, Dr. Levinsky wrote articles on ethics that were widely read by policy makers and students of medicine. He stressed that the needs of patients should come before their financial interests and that the elderly deserve equal care, for example. But he went beyond writing about ethics and took time to talk with his patients, carefully explaining their medical conditions and treatment options.

“Norman was one of the leading architects of our Medical Campus as it exists today, and his death represents a serious loss for all of us,” adds Chobanian. “I will truly miss his many, many years of friendship and his wise counsel.”

He is survived by his wife, Elena; two sons, Harold and Andy; daughter and son-in-law, Nancy and Howard Safran; his mother and stepfather, Gertrude and Louis Feldman; a sister, Ellen Sussman; and three grandchildren.
Leonard Cibley, MD, of Newton, Mass., on August 26, 2003, at the age of 83. An obstetrician-gynecologist, Dr. Cibley delivered thousands of babies during his four-decade career.

Graduating from Boston University School of Medicine in 1952, he later joined its staff in 1965 as a clinical assistant, eventually becoming a clinical professor of obstetrics/gynecology. Dr. Cibley practiced for many years in Waltham and Brookline and was on staff at the Deaconess-Waltham Hospital. He served as chief of the Dysplasia and Colposcopy Clinic at Boston City Hospital, now Boston Medical Center. He also lectured at conferences at Harvard, bringing students and colleagues up to date on the latest technology in the field. Making his own contribution to technology, he designed a surgical tool used to perform biopsies.

Dr. Cibley began his career as an entertainer and used this background to write and direct a movie on family-centered childbirth called *A Labor of Love*. He also served in the U.S. Navy during World War II as a pharmacist mate first class.

He is survived by his wife, Shirley; two sons, Jerold of Foxborough, Mass., and Laurence of Texas; a sister, Doris Ochs of Waltham, Mass.; and four grandchildren.

Benjamin Kaminer, MD, of Woods Hole, Mass., on December 13, 2003, at the age of 79. Chairman of the BUSM Department of Physiology from 1970 to 2000, Dr. Kaminer will perhaps best be remembered by the more than 5,000 medical, dental, and graduate students who were enthralled by his teaching skills. An inspiring educator with a deep understanding of physiology and medicine, Dr. Kaminer believed students should observe phenomena whenever possible instead of simply reading about it. He would present hemodynamic principles with reservoirs and tubes, for example, or demonstrate respiration by balancing precariously on a stage table to expand an isolated lung in a bell jar. He also advocated hands-on experiments. His efforts won him numerous awards, including the Stanley L. Robbins Award for Excellence in Teaching and the 1998 University Scholar/Teacher of the Year Award. Dr. Kaminer also lectured on anatomy at Harvard Medical School.

Dr. Kaminer had a wide range of research interests as well. While at BUSM his research focused mainly on the calcium regulatory mechanism in striated and smooth muscle, although through his long-standing endeavors at the Woods Hole MBL each summer he also studied a range of calcium-regulated processes in other animal model systems. His work was published in some of the most prestigious international scientific journals.

He was a member of the Board of Trustees at the MBL from 1976 to 1984, on its executive committee from 1976 to 1979, and chairman of its instruction committee from 1975 to 1980. He was a long-standing chairman of the scholarship committee of the Society of General Physiologists and served on the Board of Trustees for the Harvard Apparatus Foundation, the Mountain Foundation Fellowship, and the William Townsend Porter Foundation.

Dr. Kaminer is survived by his wife, Freda; son, Brian; and daughter, Lauren, all of Woods Hole.

Theodore Nadelson, MD, of Brookline, Mass., on October 20, 2003, at the age of 73. A professor of psychiatry at BUSM and formerly vice chairman for education in the Division of Psychiatry, Dr. Nadelson was known as an outstanding educator, a wonderful lecturer, and a great wit and listener.

Dr. Nadelson served in the Army for several years, and then following his service he earned a master’s degree at the University of California at Berkeley and a medical degree from UC-San Francisco in 1960. In 1968 he moved to Boston and became a resident at Beth Israel Hospital. He taught at Harvard
and Tufts medical schools and for the past seven years at BUSM. In recognition of his teaching, he was awarded the Jacob Schwarz, MD, Outstanding Teacher Award by the BUSM class of 2003 psychiatry residents.

Dr. Nadelson's expertise was in psychosomatic disorders, consultation-liaison psychiatry, and, more recently, war-related post-traumatic stress disorder. He authored more than 50 professional papers, including pioneering articles on Munchausen syndrome, and served as chief of psychiatry at the VA Boston Healthcare System, Jamaica Plain campus, until his retirement in 1997.

He is survived by his wife, Carol; son, Robert, of New York City; daughter and son-in-law, Jennifer and Michael, and granddaughter, Sarah, all of Boston.

Stanley Robbins, MD, of Cambridge, Mass., on October 7, 2003, at the age of 88. A respected physician and professor, Dr. Robbins was perhaps best known as the revolutionary author who brought the study of pathology to life for medical students with his textbooks. By taking a conversational tone in his writings, Dr. Robbins made the subject more accessible to students. He also emphasized the mechanisms that underlie illnesses, helping students understand why a disease happens and what it does to a patient.

After attending Tufts Medical School, at which he delivered the valedictory address, Dr. Robbins trained at Boston City Hospital. He taught at BU, Harvard, and Tufts medical schools, and he took a post at BU's Mallory Institute of Pathology, of which he became director in 1965. Dr. Robbins also served as chairman of the BUSM Department of Pathology from 1966 to 1979. It was while lecturing on pathology at BUSM that he decided to write a textbook, saying the available pathology books were too dry. Initially Dr. Robbins couldn't find a publisher, but his persistence paid off and the first edition, *Textbook of Pathology*, was published in 1957. Today more than two million copies have been sold, and the book endures as *Robbins' Pathologic Basis Disease*.

Dr. Robbins also did some notable research, helping develop the frog pregnancy test, a precursor to the rabbit test and at one point the standard test for pregnancy worldwide. He did some early research into coronary artery disease as well.

He is survived by his children, Jonathan of Swampscott, Mass., Rebekah (Robbins) of Homestead, Fla., and Jeffrey Mark of Swampscott; six grandchildren; one great-grandchild; and his companion, Joan Wylie. His wife, Eleanor, died in 1996.

Eli Shapiro, MD, of Newton, Mass., on November 30, 2003, at the age of 89. A family doctor for 65 years, Dr. Shapiro was known for the personal care he gave his patients, still making house calls until eight months before his passing. He treated generations of patients from the same family and kept in touch with many of them throughout all the years.

While attending a six-year medical program at the University of Massachusetts and Middlesex College of Medicine and Surgery, Dr. Shapiro volunteered at Boston City Hospital during the summers. After graduating in 1937, he passed the State Board Examination and soon afterward began his private practice. From 1943 to 1946, he put his practice on hold and served as a captain in the Army Medical Corps in Tennessee, Belgium, and Italy. Once back from overseas, he reopened his private practice.

Dr. Shapiro was affiliated with the Boston Medical Center and was a BUSM assistant clinical professor in the Department of Family Medicine since 1973. He served as a consultant to the BUMC Continuing Education Advisory Committee and volunteered his services at BUMC's Outpatient Department for 20 years. He also was awarded the Distinguished Physician Award by the Evans Medical Service Department of Medicine Housestaff.

He was a life member of the Middlesex chapter of the Brandeis University Club, and he was an organizing committee member of the Middlesex Healing Arts Foundation. He was a diplomate of the American Board of Family Practice from 1983 to 2004 and received its Award of Merit in 1977. He also was a member and charter fellow of the American Academy of Family Physicians.

In Memoriam

Alumni

Jerome L’Heureux, MD ’34, of Meriden, Conn., on September 28, 2003, at the age of 97. Dr. L’Heureux had a private pediatric practice in Meriden until his retirement in 1985.

A lieutenant in the U.S. Navy, he served in the Pacific during World War II. After the war, he was assigned as head of the Department of Pediatrics at Chelsea Naval Hospital in Massachusetts. During his 50-year medical career, he was also on the staff of the Meriden-Wallingford Hospital and the Veterans Memorial Hospital, where he served in different capacities, including as chief of Pediatrics. Additionally, he was on the staff of the Meriden Health Department and served as a school physician for 45 years in most of the schools in Meriden.

Dr. L’Heureux was a member of the American Medical Association, Connecticut Medical Society, New Haven County Medical Society, Meriden-Wallingford Medical Society, New England Pediatric Society, Hezekiah Beardsley Pediatric Society, and Franco-American Medical Society.

Predeceased by his wife, Irene, he is survived by his 7 children, 19 grandchildren, and 25 great-grandchildren.

Harold Chase, MD ’38, of Keene, N.H., on October 1, 2003, at the age of 91. An anesthesiologist, Dr. Chase formed the first Department of Anesthesia at the University of Virginia Medical Center in Charlottesville in 1949.

He was a clinical professor of anesthesia at Thomas Jefferson University Hospital in Philadelphia from 1955 until he retired in 1980. Open-heart surgeries were pioneered at this hospital, and Dr. Chase took part by providing the anesthesia.

He is survived by his wife, Elizabeth (Wagner) Chase, two sons, a daughter, a sister, seven grandchildren, and six great-grandchildren.

Harold Marcus, MD ’39, of Boca Raton, Fla., on September 8, 2003, at the age of 88. Dr. Marcus served as chief of Medicine at the International Ladies Garment Workers Union Health Center in New York City from 1953 to 1996 and had a private practice in Brooklyn from 1949 to 1988.

A lieutenant colonel in the U.S. Army from 1941 to 1946, Dr. Marcus received the Bronze Star and was the recipient of the General Chiang Kai-shek Merit Citation. He was a diplomate of the National Board of Medical Examiners and the American Board of Internal Medicine.

He is survived by his wife, Beatrice, two sons, and three grandchildren.

Eleanor Mendell Worsley, MD ’43-B, of Baton Rouge, La., on December 4, 2003, at the age of 85. An internist and family practitioner, Dr. Worsley was Natchitoches Parish’s first woman doctor. In practice for 54 years, she was revered for her dedication to the poor, making charitable house calls to her rural patients regardless of the weather or the travel conditions. She organized the first intensive care unit at the Natchitoches Parish Hospital, and she helped found the Alzheimer’s facility in Natchitoches’ Heritage Manor, which was later named for her.

Dr. Worsley’s first medical office was dedicated to her in 1974 as the Bayou Folk Museum, and the Louisiana State Medical Society honored her in 1993 for her continuous 50-year practice. Upon her retirement in 1998, Dr. Worsley was honored by the Louisiana governor, legislature, and the city of Natchitoches for her tireless work and social dedication. She was chosen as one of Louisiana’s Women of the Century in 2000.

Predeceased by her husband, Donald Harlow Worsley, she is survived by her daughter, grandson, and brother.

Walter Cervoni, MD ’49, of Guaynabo, Puerto Rico, in October 2003, at the age of 77. A clinical pathologist, Dr. Cervoni worked for the Chief Laboratory Service at Doctors Hospital in Santurce and Auxilio Mutuo Hospital in Hato Rey.

He was a consultant for the Veterans Administration at San Patricio Hospital and taught pathology at the University of Puerto Rico in San Juan.

Dr. Cervoni was a member of the United States Public Health Service and served in the U.S. Army Medical Corps. He also was a member of the Puerto Rico Medical Association, American College of Physicians, and American Society of Tropical Medicine and Hygiene. He was a Fellow of the College of American Pathologists and the American Society of Clinical Pathologists, and he was a member and state representative for the Puerto Rico-American Society of Blood Banks.

He is survived by his wife, Maria Ruiz Soler.