see page three
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Dr. Betty Diamond, Weinstock Professor of Microbiology & Immunology, professor of medicine, and chief of the division of rheumatology, has been awarded a five-year grant totaling $22 million to fund a new NIH-designated "Autoimmune Center of Excellence" at Einstein. It is one of nine such centers throughout the country that carry out clinical trials and basic research on autoimmunity and therapies for autoimmune diseases.

Dr. Leonard Bogush, professor of medicine and cell biology at Einstein and director of Montefiore's Genomics Anatomy Laboratory, has been awarded a five-year, $10 million grant to study how a Western diet interacts with genetic factors to increase the risk of colorectal cancer.

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NewsReel

VINTAGE AWARD SEASON FOR EINSTEIN FACULTY

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Unlike protein synthesis in which cells faithfully translate RNA derived from a DNA blueprint, there is no straightforward road map for making carbohydrates. Instead, a complex series of enzymatic reactions transfers simple sugars to growing polypeptide chains. These polysaccharides are then attached to proteins and lipids to form glycoproteins and glycolipids, respectively. The process of synthesizing complex carbohydrates, called glycosylation, and the enzymes that carry out glycosylation are glycosyltransferases. Some genes don’t code for sugars they do for proteins, but they do encode the glycosyltransferases that build sugars and transfer them to proteins. The first glycosyltransferase gene cloned was discovered in the late 1980’s. As testament to the importance of glycosylation, current estimates suggest that more than 300 genes are involved in this process. Dr. Stanley’s group at Einstein has cloned several of these glycosyltransferases.

The process of glycosylation begins with an assembly line, featuring numerous enzymes that carry out specialized tasks. Each enzyme transfers just one sugar (e.g., fucose) to a particular glycoprotein. This process is repeated for each sugar added to the N-acetylglucosamine to fucose on Notch signaling, says Dr. Stanley. “Now we can start thinking about drugs or possibly even gene therapies that can help people with such problems.”

So far, diseases known to be associated with glycosylation are relatively rare. But Dr. Stanley wouldn’t be at all surprised if defective glycosyltransferases are implicated in more common health problems. “They not only connect the lectins to otherwise unoccupied cell-surface receptors, but also animal lectins, the first of which was purified in 1974 by two Einstein researchers—Drs. Anatol Morell (now retired) and Richard Stockert, professor of medicine—along with collaborators at the NIH. Dr. Fred Brewer, professor in the department of molecular pharmacology, has continued Einstein’s notable tradition of lectin research. He started out studying plant lectins and more recently has worked with the animal variety. Dr. Brewer’s studies have provided important insights into lectin-cell signaling.

The receptors on cell surfaces account for only half the role sugars play in cell-signaling story. Something else must come along and initiate the signal. As noted earlier, a molecule that binds to and activates a cell-surface receptor is known as a ligand. And arguably the most important ligands are the lectins. Found on the surfaces of also animal lectins, the first of which was purified in 1974 by two Einstein researchers—Drs. Anatol Morell (now retired) and Richard Stockert, professor of medicine—along with collaborators at the NIH. Dr. Fred Brewer, professor in the department of molecular pharmacology, has continued Einstein’s notable tradition of lectin research. He started out studying plant lectins and more recently has worked with the animal variety. Dr. Brewer’s studies have provided important insights into lectin-cell signaling.

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branches possess the same epitope that is involved in cell-cell binding. For their part, multivalent lectins contain several protein domains, each of which can bind to the same carbohydrate epitope.

Dr. Brewer described his research this way: "What we’ve been doing is the very fundamental studies of the physicochemical interactions that occur between multivalent lectins and multivalent carbohydrates. This involves looking at such properties as the thermodynamics of these interactions as well as the structures formed as a result of these physical interactions.

For their thermodynamic studies, Dr. Brewer and his colleagues systematically measured the energy transfers that result from these interactions. ‘We’re foremost here at Einstein to state-of-the-art instrumentation that measures the thermodynamics of molecules binding to each other. These instruments allow us to quantitate the energy released when lectin bind to carbohydrates.’

A ‘wonderful thing’ about thermodynamics,” says Dr. Brewer, “is that if plant lectins are similar in structure to animal lectins—and they are—they’re the same; true thermodynamically in plants must also be occurring in animal systems. Then there’s the fact that thermodynamics doesn’t know the difference between in vitro and in vivo. So you know that any interactions that you measure in a test tube will also be happening in plants and animals.”

Dr. Brewer’s thermodynamics work is Dr. Brewer’s nearly 20 years of research into the structure of the lectin-carbohydrate complex. ’Our major contribution here,” he says, “is finding that multivalent carbohydrate and multivalent lectin interact to form highly organized crosslinked lectin-lattices. Some of these lattices are in two dimensions, others are in three, but the really intriguing aspect is their uniqueness.”

He describes a typical experiment: “We would take a tetralateral lectin and combine it in a test tube with three bivalent carbohydrates that have the same two epitopes.

“It’s going to be a real challenge to understand how that complexity relates to the function of carbohydrates. But once that we do, we’ll be able to put this field onto a really solid footing.”

but different structures with respect to their branching. After allowing time for the sugars to equilibrate, we’d find that three distinct precipitates had formed. Examining the precipitates using electron microscopy and X-ray crystallography, we would see that each had a different crosslinked lectin structure that was specific for the individual carbohydrate and the individual lectin that formed it. We observed similar results for every class of plant lectin we could put hands on and we found that multivalency made this structure even more complex. ’Our major contribution here,” he says, “is finding that multivalent carbohydrate and multivalent lectin interact to form highly organized crosslinked lectin-lattices. Some of these lattices are in two dimensions, others are in three, but the really intriguing aspect is their uniqueness.”

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unwanted T cells are eliminated within the thymus gland through programmed cell death, the process also known as apoptosis.

Dr. Baum found that an animal lectin known as galectin-1 induces T-cell apoptosis. And she has gathered evidence suggesting that apoptosis is triggered by the lectin that forms when galectin-1 binds with glycoproteins on the T-cell surface.

’Galactin-1 is secreted by epithelial cells of the thymus gland,’ where T cells develop. It can bind to four different T-cell glycoprotein receptors, which normally are distributed uniformly over the cell surface. In studies using fluorescent antibodies, Dr. Baumann made the surprising observation that exposing T cells to galectin-1 makes the four glycoprotein receptors reaggregate into two types of discrete clusters. She has hypothesized that this cross-linking has caused this shifting in cell-surface receptors— and the apoptosis that follows. She’s discovered that a cross-linking of this kind generally influences the function of carbohydrates,” says Dr. Brewer, “although some studies suggest that carbohydrates can activate T cells or that carbohydrates can induce T-cell apoptosis.

If you expose T cells to both galectin-1 and galectin-1-apos-apos-apos-apos, they won’t happen,” says Dr. Brewer. ’We’ve been studying how galectin-3 crosslinks galectin-1-and prevents apoptosis from occurring. Dr. Brewer believes that this explanation lies in galectin-3’s valency. ‘We’ve found that galectin-3, which forms a strong binding specificity like galectin-1, meaning that both of them bind to the same T-cell glycoproteins. But to this one case that we’ve been able to put this field onto a really solid footing.”

D e. Steven Porcelli, associate professor of medicine in Einstein, also works with T lymphocytes. He studies how T cells that recognize lipids and glycolipids influence a wide spectrum of immune-system responses—combating infections, shrinking tumors and regulating autoimmune reactions.

‘T cells have gained a high profile in recent years, because they’re attacked by the AIDS virus, HIV. ‘We wish Dr. Porcelli? as a result of AIDS, we now know that the T cell is a very important component of the immune system. Once we lose T cells, everything falls apart, and we lose the ability to fight these infections. We’re now learning that normally would be innocuous. Dr. Porcelli explains that all creatures possess what’s known as innate cellular immunity, which cells equipped with cell-surface receptors that can recognize certain fixed molecular patterns associated with pathogens. But only vertebrates possess the more sophisticated adaptive (acquired) cellular immunity. The T cell, says Dr. Porcelli, is the master regulatory cell” of the adaptive immune response. T cells are the white cells that recognize bacterial or viral antigens from previous encounters, says Dr. Porcelli. ‘They then respond by recruiting other cells that flood in to kill the pathogens. In addi-
Scoping Out the Causes of Birth Defects

It may not seem obvious, but learning how a single, fertilized cell becomes a fully formed human baby can be useful in cancer research. Both processes involve cells that multiply rapidly—a normal occurrence in embryonic development, but destructive in cancer. In both processes, the same genes may be implicated in the rapid cell division. In her developmental genetics research, Dr. Paula Cohen is studying a family of genes involved in both colorectal cancer and the development of sperm and ova. Dr. Cohen, assistant professor of molecular genetics, has always been fascinated by the complexities of pregnancy—especially how pregnancy usually goes right when so many things can go wrong. Her graduate studies at King’s College in London focused on developmental defects in early pregnancy. After completing her studies in England, Dr. Cohen arrived at Einstein’s Becker Institute for Postdoctoral Studies in 1993 to continue her training and to work with Dr. Jeffrey Powell. More recently, Dr. Cohen’s research has involved mice, the process by which germ cells in the ovaries and testes convey genetic material to eggs and sperm, respectively. In mice, this genetic transmission can lead to mutant embryos; and little is known about what causes these errors. One approach to studying mutations is to isolate individual cells (from mice) as they are formed in the uterus, characterize their genetic content and note how the cells are conducting their housekeeping chores and programmed development. Isolating such individual cells from a mass of tissue can be a technological nightmare. Locating the cells is difficult, and then comes the problem of plucking out a single cell that is less than a thousandth of an inch across without dragging along unwanted additional tissue with it. But a new technology—an instrument known as a laser capture microdissection system—has come to the rescue.

Dr. Cohen at her laser microdissection scope.
UpClose & Personal

Stephen Atwood, M.D., Class of ’72

I n January, when Dr. Stephen Atwood (class of ’72) returned to the Albert Einstein College of Medicine to receive the 2002 Alumni Association’s Life Achievement Award, he made a presentation about global medicine. At the time he could not have imagined that, within a few months, the region where he serves as UNICEF’s regional advisor for health and nutrition—East Asia and the Pacific—would become the epicenter for a disease, severe acute respiratory syndrome (SARS), that would bring world-wide attention to the very issue.

Dr. Atwood’s talk offered insights into the “globalization” of health issues as well as suggestions for how the medical profession can better address these issues. Throughout his travels on behalf of UNICEF, Dr. Atwood visits 25 developing nations that typically have limited resources. He has seen, firsthand, the challenges these nations face in promoting good health and providing adequate health care to their people. These challenges have included vaccinating the children of Kurds against polio while also combating tribal distrust; assuming that insects canid to protect villagers in Papua New Guinea against malaria get used to good effects; and providing educational and medical tools to healthcare givers within marginalized communities, which are often many miles from the nearest roads or hospitals.

While these examples may not themselves pose a risk globally, our shrinking world does, Dr. Atwood noted. “Each day, one million people cross borders and travel between nations or even continents. Boundaries are disappearing, augmenting the potential for the spread of diseases or viruses globally, whereas before they remained more localized,” he said. “While the poor—mostly women and children—are most directly affected by this ‘small world syndrome,’ ultimately, we are all at risk.”

The spread of SARS, with many of those diagnosed in North America and Europe having recently traveled in Asia, poignantly illustrates this very point. “We need to recognize that diseases are not isolated and to globalize medical education. To do this, we need to expand opportunities for research, conduct educational analyses, and thoroughly assess each nation’s resource needs. We also need to go into the lab and direct technology at addressing global needs, and we need to make global medicine an integral part of the medical education our future doctors receive.”

With the education of future doctors in mind, Dr. Atwood has a vision of setting up a graduate student exchange program where a student from a U.S. (or Canadian or European) graduate school would work with a graduate student from an Asian university on a research problem that they would define along with UNICEF. These problems could address a broad range of medically related issues including medicine, public health, and even economics.

“The importance of the pairing would be to allow each student to learn from the skills of his/her collaborator,” Dr. Atwood explained. “It would also be important to pair up faculty advisors from each institution. And the end result would be a Masters or Doctoral thesis, or publication.”

In his address, Dr. Atwood also stressed the role that prestigious institutions, such as Einstein, could play in drawing connections between what is going on in health in developing countries and how it affects health care in the U.S. (Again, the recent emergence of SARS as a threat to health worldwide underscores the relevance of this issue.)

While Dr. Atwood noted that training students and involving leading institutions in the addressing of global medical issues is critical, he also spoke about the importance of educating the general population about health. During his career he has traveled far and wide and witnessed the healing power that knowledge can provide.

“I really enjoy being involved in training and working with people who are struggling with real problems of life and death in the field,” he said. “When you apply participatory methods and ask the kind of questions that make people’s awareness and ability to analyze their own situation, you can watch people absolutely unfurl and take off. It gave me my first understanding of what the word empowerment meant.”

Dr. Atwood’s most important “take home” message about globalizing medicine, stemming from the experiences he has had during nearly three decades of work abroad, was: “It cannot be done alone.”

“Everything in this business is working with others, bringing each individual’s expertise and skill to bear on solving the problem at hand,” he said.

His selection for the Einstein Alumni Life Achievement Award recognized his role in such team efforts—namely his life of service to medicine for the under-served populations of East Asia and the Pacific—and acting as an exemplary model for future generations of physicians.

The editors thank roving physician-photographer Steve Atwood for the photoessay accompanying this story.

▼ This photo was taken on a visit to the town of Atikal in the northern part of Papua New Guinea near Mount Wilhelm. The area is covered with tropical rainforests that are home to many rare and endangered species. The first thing that caught my eyes was this group of monkeys, and it struck me as a wonderful opportunity to capture their image in their natural habitat.

▼ On the way back from Kilimeni Village, a traditional village near Mount Wilhelm, we stopped at a small village on the side of the road to photograph the children. I was struck by their innocence and their simple way of life. The children were playing with their toys and laughing, oblivious to the camera. It was a heartwarming experience to see their joy and happiness.

▼This is an example of a typical “mayor” of a small village in East Asia. The mayor is responsible for maintaining order and carrying out the wishes of the villagers. He is often chosen based on his leadership skills and ability to resolve conflicts peacefully. His role is crucial in maintaining social harmony and ensuring the well-being of the community.

▼ This is a typical village scene in rural East Asia. The houses are made of wood and are usually surrounded by lush, green vegetation. The people here lead simple lives, working hard in the fields and maintaining close relationships with their neighbors. Despite the lack of modern amenities, they manage to live in peace and harmony with nature.

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▼ This photo was taken on a visit to a village in rural East Asia. The village is situated on the banks of a river, with the houses built on stilts to protect them from flooding. The people here rely on farming and fishing for their livelihood, and their way of life is closely tied to the natural environment around them.

▼ This is the “mayor” of the village, a person who is elected by the villagers to represent their interests and make decisions on behalf of the community. The mayor is an important figure in rural Asian villages, and his role is to ensure that the needs of the community are met.

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What’s Ahead for Med Ed?

by Albert S. Kuperman, Ph.D.
Associate Dean for Educational Affairs

The transition from genomic science to clinical genomics will not come quickly or easily. It will probably be another decade or two before genomics takes center stage of clinical practice... but still well within the professional lifetime of the graduating students here today.

The keynote address was delivered by Dr. Kuperman on May 1, 2003, at the ceremony inducting Einstein students into the graduating students professional lifetime of the graduating students here today.

While the medical students have today been the path to becoming physicians, the scientific foundation of clinical medicine continued to expand. New clinical applications of biomedical science and technology were discovered and deployed. The cultural, economic and demographic environment in which medicine is practiced continued the transformation begun in the 70’s. These changes will continue after even students graduate and practice through the years of graduate medical education and beyond. This is why, whether they be practitioners or teachers of medicine, physicians must be independent, self-directed and effective learners throughout their professional lives.

How does medical education respond to biomedical science discoveries and changes in the practice environment? It, too, must change in both evolutionary and revolutionary ways, sometimes by adding new learning goals, sometimes by integrating whole new disciplines, sometimes by

altering the strategies of teaching and learning. Obviously and emphatically, medical education cannot be allowed to develop static cling.

I would like to discuss just a few areas of educational change that are likely to be addressed with some vigor while the graduating seniors setting here today are in their final years in medical school. These students will need to figure out how to learn what their patient’s student success will be learning. Faculty in the audience will need to integrate new knowledge and approaches into their teaching. And for everyone out there, what more do your physicians need to know?

So, without further delay: What’s ahead for Med Ed? First on my list is genomic medicine. It was only about 15 years ago that the so-called "gene-centric" view of medicine was first proposed by James Watson, co-discoverer of the structure of DNA. The idea was that because humans are 99.9% genetically identical, the differences between people must lie in the genetic code. Thus, studying genetics and genomics... then knowing the gene's sequence in man, or other animals, and microbes, was the key to understanding the function and regulation of the cell, the organ, and the organism. This is probably just the tip of the iceberg.

Except for monogenic traits, each of us has a unique genome, and this has enormous implications for patient care. Knowledge of a person’s genome will enable us to predict that person’s risk of common diseases and undesirable responses to the environment and to drugs. Thus, we have the potential for a genomically based practice of primary preventive medicine. We also have the potential for development of genomically based medicines and therapeutics. Knowledge of micromutations and single nucleotide polymorphisms may lead to better methods for preventing, diagnosing and treating infectious disease and will provide new tools for personalized and biotechnical defense.

The transition from genomic science to clinical genomics will not come quickly or easily. It will probably be another decade or two before genomics takes center stage of clinical practice. As we are all aware, genomic science is still well within the professional lifetime of the graduating students here today.

Drug and medical diagnostic companies are looking for a fully grown genomic medicine to happen. They hope to find genomically based human protein and antibody drugs through genomics-based research. They are already developing new diagnostic tests based on abnormal proteins that are the consequence of genomic disease. We are beginning to see genotyping and protein-testing methods that flag patients with genetically based risks, identify patients at risk for developing adverse responses to certain drugs, and spot diseases before they are associated with symptoms. Gene chip diagnostics using DNA microarrays is already well established in diagnosing the most common form of non-Hodgkin’s lymphoma; and just think, it was three years ago that the so-called lymphoschistosis was beamed in, with its most high-powered colors on the body’s surface. This is among the abnormalities associated with normal and abnormal immune responses. We are moving toward a genomically based profession. Patients can access information about the millions of proteins and the millions of antibodies in their body and the interactions of all genes in the entire genome, whose sequence in man, other animals, and microbes, we now know.

What's Ahead for Med Ed?

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Kentviewed the source of London’s huge cholera epidemic in 1854. In 1864, Dr. Snow traced the source of London’s huge cholera epidemic to a pump on Broad Street that was leaking sewage into the public’s drinking water. He thus ended the epidemic by forcefully putting the pump out of commis

sion. A generation later, still savoring his epidemiologic victory, Snow was among the first to recom-

mend that preventive medicine be taught in medical schools. One hundred and fifty years later, we are still waiting for Dr. Snow’s recom-

mendation to be implemented. We should do it now.

Imagine how physicians could influence positively the health of populations if they were educated in principles of disease prevention and behavioral change appropriate for specific populations; if they learned the importance of respecting cultural and economic diversity; if they were willing to work as part of teams and in collaborators in health care teams; if they accepted some responsibility for the health of populations.

Most physicians of today would probably not oppose Medicare and Medicaid the way individual physicians and the A.M.A did when these programs were first proposed by the White House in the 1960’s. On the other hand, I don’t see too many of today’s physicians or medical students taking robust stands against a White House economic policy that will cause a huge reduction in health care financing during the next 10 years. I’m also concerned with the medical community’s increasing tolerance for a health care non-system that permits more than 40 million uninsured individuals, including an enormous number of children. Need I remind you, we are still the only Western industrialized nation that does not have a national health insurance program except for the elderly or impoverished. We seem even further from the goal of universal health insurance today than when such a system was proposed by the White House in early 1993.

I am postulating that a pervasive and persuasive education in prevention and population sci-
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The last item for educational change that I want to discuss is the need to move more seriously to integrate mind, body and behaviors of professionals and humanity in our students. In its 1995 “Project Professionalism,” the American Board of Internal Medicine specified some of the essential elements of professionalism. They included altruism, duty and service, integrity and honor; accountability, empathy, compassion, respect for others, and excellence.

Within the academic community and among the public, there is a growing concern that physicians’ historical commitment to professionalism and humanity is waning. Indeed, there is ample evidence of the public’s increasing skepticism about the commitment of physicians to place their patients’ interests above their own. Despite many studies about causes of decreasing doctor-patient relationship, a satisfactory explanation has been elusive. This is not to say that medical care, including costs, is the only contributor to the dehumanization of doctors and patients. The major point is that we have to relearn the ability to appreciate the mundane. Her point is that physicians must regain their humanity after they complete their training. For my part I tried hard not to lose it, or at least to hold on to it as long as possible.1

Let me give you one example of a program developed to nurture a few qualities of professionalism and humanity, especially the quality of compassion. It is a program originally conceived and produced for someone whom I see as one of the great people in American medicine. Her name is Rachel Naomi Remen and she is the University of California at San Francisco. She calls her program “Healing Arts.” Originally developed for physicians experiencing burnout and the need to refresh mind and spirit, Dr. Remen then offered the program as an elective to medical students at UCSF. It was tremendously popular among the students who, as soon as it was reestablished in Stanford and Dartmouth. This year, for the first time, a group of 40 first-year students signed up for it. They participated in five-hour sessions during January and February, away from the usual schedule of patient care. They had one day to learn new skills, to learn about various aspects of medicine and to be with others who were interested in these topics. For example, they had an art class taught by a local artist and a class in yoga taught by a local yoga instructor. They learned about how to make paper lanterns and how to make sushi. The major part of their sessions was spent working on the idea of compassion and how to practice it in their everyday lives. They were asked to write about their experiences and how much they accomplished. What was the most valuable part of their experience? This was what they wrote down:

“Confidence in what I will bring to my medical practice—diagnosis and treatment, but also relationships, caring, and human.”

Remember, these comments were from students who had completed only five months of medical school! Let's discuss caring, trust, communication, patient participation and commitment to the relationship between physician and patient. This is the first of two papers that I want to discuss in the principles, concepts and practices of integrative medicine.

Let’s start with something that conventional medicine cares about... at least at first. A patient feels lousy and her physician prescribes a drug. What the patient wants, what she needs, what she deserves is that her symptoms disappear. That is what is expected of medical science. That is what is expected of professionals and patients.

The patient’s desire to have nothing to do with state-of-the-art technology, technology, or life-saving procedures. They simply refer to the loss of the domain of the doctors of the hidden curriculum and the socialization process. To quote from one student, “The whole ‘nature of man’ thing is not from Einstein but from another excellent medical school.”

For two years, lecturers galore argued about their own particular niche as if it were the most important thing for a student to learn. What is it? Depending on the clinical years, life is brutal. People are rare. Hours are long. And those are always a test at the end of the rotation. After a while, I realized that the most important thing I could do for my patients, for my fellow human beings, was to assure myself some peaceful time. I made a point of avoiding my exercise, my reading, my exercise, my exercise, my exercise. I read Perel-Klass’s novel in which she reminds us of the value of the doctor-patient relationship. She tells us that physicists must regain their humanity after they complete their training. For my part I tried hard not to lose it, or at least to hold on to it as long as possible.2

Integrative medicine... is about restoring care, trust, communication, patient participation and commitment to the relationship between physician and patient. Largely due to the work of John Kulis and his colleagues at the University of Massachusetts Medical Center, mind-body medicine has a substantial scientific foundation and evidence has not only been shown to other forms of alternative medicine but even compared to many widely used conventional medical treatments.

Integrative medicine is open to ideas and views that, compared to other forms of alternative medicine but even compared to many widely used conventional medical treatments.

Integrative medicine places great emphasis on something that conventional medical practice has long, long past: the relationship between physician and patient. The loss of the doctor-patient relationship, the caring bond and superb communication between caregiver and patient, a sense by the patient of the caregiver’s commitment to his or her health, is the responsibility of the physician to engage the patient’s feelings. The physician’s presence must be the knowledge of the doctor-patient relationship.

In the search for more compelling evidence, we must consider the fact that professionalism and humanism in medicine have always played a role in the doctor-patient relationship. It is not to say that medical care, including costs, is the only contributor to the dehumanization of doctors and patients. The major point is that we have to relearn the ability to appreciate the mundane. Her point is that physicians must regain their humanity after they complete their training. For my part I tried hard not to lose it, or at least to hold on to it as long as possible.3

Let’s now talk about the nature of education. I would like to introduce you to someone whom I see as one of the great people in American medicine. Her name is Rachel Naomi Remen and she is the University of California at San Francisco. She calls her program “Healing Arts.” Originally developed for physicians experiencing burnout and the need to refresh mind and spirit, Dr. Remen then offered the program as an elective to medical students at UCSF. It was tremendously popular among the students who, as soon as it was reestablished in Stanford and Dartmouth. This year, for the first time, a group of 40 first-year students signed up for it. They participated in five-hour sessions during January and February, away from the usual schedule of patient care. They had one day to learn new skills, to learn about various aspects of medicine and to be with others who were interested in these topics. For example, they had an art class taught by a local artist and a class in yoga taught by a local yoga instructor. They learned about how to make paper lanterns and how to make sushi. The major part of their sessions was spent working on the idea of compassion and how to practice it in their everyday lives. They were asked to write about their experiences and how much they accomplished. What was the most valuable part of their experience? This was what they wrote down:

“The importance of not losing yourself in the process of becoming a healer.”

“Sharing emotions (crying, hugging) can be beneficial for patients.”

“Confidence in what I will bring to my medical practice—diagnosis and treatment, but also relationships, caring, and human.”

Remember, these comments were from students who had completed only five months of medical school! Let’s discuss caring, trust, communication, patient participation and commitment to the relationship between physician and patient. This is the first of two papers that I want to discuss in the principles, concepts and practices of integrative medicine.
It is common for most students applying to a top-tier medical school to do very well in both science and liberal arts courses, do extremely well on the Medical College Admissions Test and have a sterling record of extracurricular activities ranging from community service to lab science research. And, still some don’t make it. Howard Dean was a political science major at Yale who could have done very much better in school but did not. He graduated in 1971 and endured the life of a stodder for two years before taking off to Colorado to think and ski. He worked at a number of odd jobs, one of which took him to a Denver hospital where he worked for six months as a night volunteer. What struck him, he writes in the essay accompanying his application to Einstein’s, was the dedication of the interns, residents and nurses working together in their sense of commitment that reminded a similar type of motivation in himself. This epiphany experience had to be tested, so he took another volunteer job at St. Vincent’s Hospital in New York City while reorganizing his life as a pugilistic premedical student at Columbia University’s School of General Studies, nearly three years after graduation from Yale. It is a fact that no student can be considered a medical student without having performed satisfactorily in general and organic chemistry physics and mathematics. Howard had been exposed to none of these subjects. Despite this, the official record from Columbia shows that in 1973 and 1974 he received no less than an A in these science subjects and (to my astonishment) A+ in organic chemistry and A+ in biology lab. Such is the power of motivation and dedication to a new life.

All applicants to medical schools are requested to write a personal statement summarizing their reason for studying medicine. Howard chose to ask himself two questions in his essay and attempt to answer them—to wit: “How should I use my talents, and what do I want to be able to look back on as my accomplishments when I’m 50?”

The answer: “At 50 I would like to look back at a career that provided, and would continue to provide, service to others and was rewarded with the warmth and strength that comes from serving interests other than one’s own.”

The Albert Einstein College of Medicine places great weight on the personal interview of a candidate for admission. Howard was inter-viewed by one of our most experienced physicians, the inter-view lasted over an hour. The what seemed to be the frank answers to direct and specific questions, some of which are given in this report. He demonstrated a mature demeanor of a man twice his age. He convinced me of his sincerity and affinity for the sick, seldom seen with frequency anymore. Howard Dean B. No longer represents a lost soul but you can count him a winner, for he has indeed come home.”

We accepted Howard Dean in 1975 and graduated him in 1978 in an accelerated program. He has never left “home.”

Dr. Dean (left) returns to Einstein in June to give the commencement address. In 1952 Dr. Fyodor (above) instructed him.

Dr. Wolkoff has the distinction of being the first Einstein alumni to head the Institute. A Dartmouth graduate, he earned a M.D. degree from Darmouth Medical School before coming to Einstein as a medical student. Graduating in 1972, he served in the Bronx to complete a residency in medicine at Bronx Municipal Hospital Center (now Jacobi). He then went to the National Institutes of Health, where he studied and mapped with imaging with a molecular position as an approach to the discovery of genes involved in tumor growth.

Dr. Michael Brownlee, the Anita and Jack Salt Professor of Diabetes Research, has been awarded the Claude Bernard Medal, the highest scientific award of the European Association for the Study of Diabetes (EASD). As the award recipient, Dr. Brownlee received the award at the 52nd Congress of the Claude Bernard Lecture at the 2005 EASD/International Diabetes Federation meeting in Paris.

Laurels

Dr. Steven Almo, professor of biochemistry and of physiology and biophysics, received the American Society for Biochemistry and Molecular Biology-Angier Award for significant achievements by a young investigator in the application of biochemistry and molecular biology to the understanding of disease.

Dr. N. Baroński, director of the Einstein College of Medicine (endocrinology) and a research associate professor of medicine (endocrinology), has been selected to serve on the editorial board of the European Journal of Endocrinology of Diabetes.

Dr. Olga Blikshteyn, professor emeritus of biochemistry, was the recipient of the 2003 Tow Foundation Great-Russmann Memorial Award presented by the American Association of Blood Banks. The award recognizes her many contributions—the study of transfusion medicine and blood group antigen polymorphism, in the establishment of a system capable of unifying antigen DNA variation in 14 blood group systems, and to the field of glycochemistry.

Dr. Erwin Bottger, associate professor of medicine (nephrology) and of molecular genetics, John Condeelis, co-chairman of the department of anatomy and cell biology, and Jeffrey Segall, professor of anatomy and of molecular biology, have received the Claude Bernard Medal, the highest scientific award of the European Association for the Study of Diabetes (EASD). As the award recipient, Dr. Condeelis received the award at the 52nd Congress of the Claude Bernard Lecture at the 2005 EASD/International Diabetes Federation meeting in Paris.
Dr. Peter Davies, the Judith and Burton P. Rosett Professor of Neurology and neurogenetics, received a National Institutes of Health (NIH) Merit Award. The award is given for ongoing support of scientific achievement as a reward for 5 years of service. It is intended as recognition of outstanding scientists. Dr. Davies is recognized for outstanding contributions to the understanding of the molecular basis of neurodegenerative diseases.

Dr. Gloria Huang, instructor of obstetrics & gynecology and biomedical engineering, received a 2003 Harold W. Hruby Graduate Student Award for her work in the laboratory of Dr. Susan Horvitz, professor of molecular biology.

Dr. A. John Rogers, professor of pediatrics and molecular biology, was named a 2003 Pew Scholar in the Biomedical Sciences.

Dr. Jeffery Gold, professor of cardiology and biomedical engineering, received the 2003-04 American Heart Association Young Investigator Award.

Dr. Solomon Meshin, professor of pediatrics and of neuroscience, received an American Heart Association Postdoctoral Fellowship.

Dr. Bryan Barrows, assistant professor of medicine and of biomedical engineering, was named the 2003 Young Investigator Award by the American Heart Association.

Dr. Susan Horvitz, cochair of molecular pharmacology and the Rose C. Falkenstein Professor of Cancer Research, has been nominated for the 2003 Joan and Sanford I. Weill Award for Career Research. The award recognizes career contributions to cancer research and the public health mission of the Weill Cornell Medical College.

Dr. Jeffrey Lesser, MD, PhD, candidate, Class of 2004, who recently completed his doctorate in the laboratory of Dr. Robert Singer, professor and co-chair of anatomy and neurobiology, received a 2003 Harold W. Hruby Graduate Student Award, presented by the Basic Sciences Division of the Fred Hutchinson Cancer Research Center.

Dr. Georgia Pappas, associate clinical professor of pediatrics and of epidemiology, received an award for her work in the laboratory of Dr. Susan Horvitz, professor of molecular biology, for her study of epithelial differentiation in young scientists whose research demonstrates both clinical and scientific significance.

Dr. William Jacobs, Jr., professor of microbiology and immunology and of molecular genetics, and Howard Hughes Medical Institute Investigator, has been elected to Fellowship in the American Academy of Microbiology.

Dr. Donna Arrowsmith, professor of biochemistry and of epidemiology, has been awarded the 2003 Outstanding Science Book Award by the National Academy Publishers, recognizing her book, “Conclusions.”

Dr. Thomas Levy, professor of biochemistry, is serving as a member of the review committee for the National Institutes of Health Bioethics.

Dr. Megan Mackay, assistant professor of medicine, was selectedhonoree of the Lupin Biennial Show, by the Lupin Foundation of America (Biosch Chemicals, Ltd.), for her work in the laboratory of Dr. Mark MacRae on research related to arthritis.

Dr. Raymond Chiu, assistant professor of cancer biology and of genetics, is one of the 2003 members of the Review Committee for the John Simon Guggenheim Memorial Foundation Fellowship, John Polachek Young Investigator Award for his continuing contributions to the American Medical Research Association.

Dr. Michael Scharf, director of the Einstein Cancer Biology and Research Center and of the Department of Pathology, received the 2003 Harold W. Hruby Award for Excellence in Medical Education.

Dr. Thomas Wilt, professor of medicine, is serving as chair of the American Medical Informatics Association Information Technology Committee.

Dr. Solomon Meshin, professor of pediatrics and of neuroscience, received the 2003-04 American Heart Association Young Investigator Award for his work in the laboratory of Dr. Susan Horvitz, professor of molecular biology, for his study of the molecular basis of neurodegenerative diseases.

Dr. Steven R. Smoller, associate professor of psychiatry and of genetics, received the 2003-04 American Heart Association Young Investigator Award for his work in the laboratory of Dr. Susan Horvitz, professor of molecular biology, for his study of the molecular basis of neurodegenerative diseases.

Dr. Sydney Koepsell, assistant professor of medicine, was named a 2003 National Institutes of Health (NIH) Merit Award. The award is given for ongoing support of scientific achievement as a reward for 5 years of service. It is intended as recognition of outstanding scientists. Dr. Koepsell is recognized for outstanding contributions to the understanding of the molecular basis of neurodegenerative diseases.

Dr. Barry Stein, professor of cardiology and of epidemiology, received the American Heart Association Young Investigator Award for his work in the laboratory of Dr. Susan Horvitz, professor of molecular biology, for his study of the molecular basis of neurodegenerative diseases.

Dr. Dodi Mahadev, associate professor of pediatrics and of oncology, received the American Heart Association Young Investigator Award for his work in the laboratory of Dr. Susan Horvitz, professor of molecular biology, for his study of the molecular basis of neurodegenerative diseases.

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GLYCOMICS
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mouse’s insulin-producing cells,” says Dr Porcelli. “Injecting a glycolipid compound into these mice will activate their CD1-dependent T cell response and prevent them from developing diabetes. We’re real interested in that, because we think we can fairly quickly develop a therapeutic approach to human autoimmune diseases by exploiting the CD1 immune response.”

Credit for preventing autoimmune reactions in the diabetes-prone mouse goes to an unlikely source: a sea sponge. A pharmaceutical company searching for anti-cancer drugs in sponges happened upon a glycolipid named alpha galactosylceramide, which was synthesized once its structure was determined. Injecting this compound into a tumor-bearing mouse makes the tumor regress significantly—somewhat like chemotherapy but without the usual side effects. Rather than poison the tumor as chemo does, alpha galactosylceramide instead directs the immune system to attack it. “What’s interesting is that this same glycolipid that provokes an immune response against tumors can also shut down harmful immune responses in the non-obese diabetic mouse,” says Dr. Porcelli.

Research has shown that alpha galactosylceramide acts in men and mice through the same mechanism: it binds specifically to CD1d proteins, one of the five different forms of CD1 protein found on antigen-presenting cells. Then, in both species, this “CD1d protein/glycolipid antigen” complex is recognized by CD1d-dependent T cells, which respond by either attacking tumors or suppressing autoimmune activity. Most of the responding T cells are a major subpopulation of CD1d-dependent T cells called natural killer T cells. “One problem with alpha galactosylceramide is that it’s sort of a blunt instrument that activates anti-inflammatory and pro-inflammatory mechanisms—often both at the same time,” says Dr. Porcelli.

“We’re now working with chemists to find variants of this glycolipid that more precisely induce one type of immune response or the other.” As new compounds are synthesized, Dr. Porcelli’s lab tests their effects on various strains of mice. Initial experiments are done with standard healthy mice. A few hours after injecting the compound into the mouse, researchers measure blood levels of two cytokines: interleukin 4, which suppresses many types of immune responses including inflammation; and interferon gamma, which is associated with tumor rejection. “If you find lots of interleukin 4 and little interferon gamma, then you know this compound might be good for treating autoimmune diseases,” says Dr. Porcelli. “On the other hand, high levels of interferon gamma and very little interleukin 4 means you might have a cancer treatment.” The interleukin-4 is released by the natural killer T cells that recognize alpha galactosylceramide; by contrast, interferon gamma is released mainly by differ