NJ's Top 10 Scientists

There are more than 400,000 scientists and engineers in New Jersey hard at work each day delivering breakthrough medicines and technologies that save lives, improve our quality of life and keep our economy competitive. With the cooperation of the leading technology trade associations in the state, *New Jersey Business* magazine is proud to present who we think are the "cream of the crop" in innovation: NJ's Top 10 Scientists. Through their hard work and dedication, these men and women have made significant contributions to their companies, research institutions and society at large. Whether it is a biotechnology drug that helps fight cancer or AIDS, or a new kind of organic, light-emitting device that is four times more efficient than liquid crystal displays, these and other innovations from the scientists profiled are testaments to the research and development work being conducted in "The Innovative State".

We extend our appreciation to The Healthcare Institute of New Jersey, BioNJ, The New Jersey Research & Development Council, the New Jersey Technology Council and the Chemical Council of New Jersey for their assistance in gathering the nominations. The editors at *New Jersey Business* selected the final winners based on the impact their work has on society at large. A special recognition is being given to one scientist who, after the judging was completed, announced his retirement.

Here, we present the innovators in alphabetical order:

SPECIAL RECOGNITION

Magid Abou-Gharbia, Ph.D., Senior Vice President and Head (Retired), Chemical and Screening Sciences, Wyeth Drug Discovery and Development, South Brunswick, NJ

In October, Magid Abou-Gharbia, Ph.D., retired after 26 years with Wyeth Drug Discovery and Development – but not before leaving his mark in the pharmaceutical industry. Over the past 20 years, Dr. Abou-Gharbia's research interest has included the manipulation of synthetic approaches in the design and synthesis of biologically active agents. His scientific contributions have resulted in over 130 publications, presentations and invited lectures and 95 U.S.-issued patents and more than 300 patents worldwide.

Under his leadership Wyeth Medicinal Chemistry discovered and marketed three leading drugs in their fields: first-in-class antidepressant Effexor®; anticancer agent Mylotarg™; and a broad-spectrum antibiotic, Tygacil™. Many compounds currently under clinical evaluation include: Sonata®, a sedative hypnotic; Temsirolimus, an anticancer agent; and Bazedoxifene, a non-steroidal hormone replacement therapy (HRT).

Dr. Abou-Gharbia's scientific accomplishments have been recognized through numerous awards from external scientific and professional organizations, as well as internal recognition including: The New Jersey Inventors Hall of Fame Award, the Procter Medal, the American Chemical Society Earle B. Barnes Award and the Wyeth-Ayerst Exceptional Achievement Award.

Sol J. Barer, Ph.D., Chairman and CEO, Celgene Corporation, Summit, NJ

For the past 16 years, Sol J. Barer, Ph.D., has been dedicated to developing a line of novel components that target the underlying cause of blood cancers such as multiple myeloma. This work has translated into the approval of two disease-altering oral therapies – THALOMID and REVLIMID – that are helping physicians move closer to turning incurable blood cancers into chronic, manageable diseases, such as diabetes or HIV.

Dr. Barer's vision has changed the course of blood cancer research and treatment, with these therapies extending survival for patients with critical blood cancers by years in many cases, rather than weeks and months. Additionally, the oral administration of these therapies is having a significant impact on patients' lives as they often do not have to undergo costly and time consuming procedures such as intravenous administrations, stem cell transplants or blood transfusions.

The approval of these therapies has had significant impact for Celgene Corp., taking it from a small, spin-off company to one of the largest biopharmaceutical companies in the world, with more than 2,200 employees worldwide and a $25-billion market capitalization. More importantly, however, is the impact on patients around the world. Novel therapies such as these are changing the perception of cancer and offering patients significant new treatment options.

In addition to continuing to pursue new avenues to improving the lives of hundreds of thousands of people worldwide, Dr. Barer has demonstrated a long-standing commitment to New Jersey. A Ph.D. graduate of Rutgers University in Organic Chemistry, he has worked with Celgene for the past 21 years. He was honored in 2008 with the Rutgers University Hall of Distinguished Alumni Award, the Ernst & Young Lifetime Achievement Award for Entrepreneurism, the Prix Galien Award for Special Therapeutic Development for REVLIMID, and was the first recipient of BioNJ's Dr. Sol J. Barer Award for Vision, Innovation and Leadership.

Additionally, he received the Rutgers University Graduate School's Annual Distinguished Alumnus Award, the Winthrop-Sears Medal from the Chemists Club and the Chemical Heritage Foundation, The Multiple Myeloma Research Foundation Corporate Leadership Award, The Leukemia & Lymphoma Society Star Award, the Emerald Entrepreneurial and Excellence Award, the Global Capital Associates and the Jerusalem Fund/Israel Albert Einstein Award in Life Sciences, The Billy Foundation Insight Award, and the DART/NYU Biotechnology Achievement Award in Applied Biotechnology.

Julie J. Brown, Ph.D., Senior Vice President and Chief Technology Officer, Universal Display Corporation, Ewing, NJ

For the past 10 years, driven by the highly commendable goals of energy efficiency and environmental sensitivity, Julie J. Brown, Ph.D. has been a leader in the development of Universal Display Corporation's phosphorescent organic light emitting device (PHOLED) technology and the development of commercial PHOLED products and licensed technology.

An OLED is an organic light emitting device that can be constructed as a display (to compete with LCDs) or as a light source (to compete with incandescent and fluorescent lighting). PHOLED technology is a significant breakthrough that has further commercial potential with wide-ranging potential impact on society and the economy. Through the use of PHOLED technology, OLEDs can be made to be four times more power efficient than a standard OLED. As a result, PHOLED displays can be up to four times more energy efficient than incumbent LCDs. Their significant power savings can lead to meaningful energy and environmental benefits on a global basis.

Dr. Brown's vision, integrity and intelligence has helped Universal Display achieve its successes to date and its world-recognized technology leadership, and has helped position the company for growth well into the future. Over the past decade, Universal Display has grown from 10 to 75 employees and from $1 million to $12 million in revenues. Due in large part to the significance of its PHOLED technology and to Dr. Brown's success in making critical technological progress toward the technology's commercialization, the company has a public market capitalization of almost $400 million and is generally recognized as the leading OLED technology developer in the world.

Universal Display also has served as a model of university/business collaboration, as its technology initially was developed by researchers at Princeton University and at the University of Southern California, with Dr. Brown demonstrating tremendous leadership in these efforts.

Universal Display has developed a broad and deep patent portfolio – with over 850 patents issued and pending worldwide – around the discovery of PHOLEDs, and has key patents in flexible, transparent OLEDs, and a number of OLED manufacturing processes. Dr. Brown has been an inventor on many of these patents. She also is an IEEE Fellow and a New Jersey High Tech Hall of Fame inductee.

Robert Falotico, Ph.D., Distinguished Research Fellow, Cordis Corporation, a Johnson & Johnson Company, Warren, NJ

Robert Falotico, Ph.D., is the co-inventor of the CYPHER® Sirolimus-eluting Coronary Stent, the first approved drug-eluting coronary stent. It is used in patients who have a narrowing in their arteries caused by atherosclerosis, the collection of fatty substances such as cholesterol along the lining of the coronary arteries.

Dr. Falotico's single-minded pursuit of the coronary drug-eluting stent as a viable therapy depended largely on his background as a leading pharmaceutical researcher and his experience in a medical device company. He played the unusual role of being both the scientific root of the product and also its primary evangelist, seeing it through into the marketplace.

The stent is mounted over a balloon on the end of a long thin flexible tube, or "stent delivery catheter." The stent is inserted into a blood vessel in the arm or groin and is advanced to the narrowed section of the coronary artery. When the stent is correctly positioned within the artery, the balloon is inflated, causing the stent to expand, pushing the plaque aside and opening the narrowed section of the artery. This restores normal blood flow to the heart.

The balloon on the catheter is then deflated and the catheter is removed from the patient. The stent remains permanently implanted within the artery, supporting the newly opened section of the vessel, while the drug (sirolimus) is slowly released into the artery wall around the stent.

The subject of more than 75 clinical trials during the past decade, the Cypher stent is one of the most-studied medical devices in history. A key clinical trial found that up to five years after receiving a Cypher stent, the risk of re-blockage in the treated part of the artery is about 10 percent, compared to about 26 percent for an uncoated stent.

Today, thanks to Dr. Falotico's determination, over three million people with narrowed heart arteries have been treated with the Cypher stent. It has reduced morbidity and mortality, and opened the door to minimally-invasive treatment for coronary heart disease, the leading cause of death in the U.S. and, increasingly, in developing nations.

Jeffrey B. Kaplan, Ph.D., Department of Oral Biology, New Jersey Dental School, Newark, NJ

Hospital- and community-acquired staph infections result in nearly 100,000 deaths in the U.S. each year. These infections, which cost $30 billion per year to treat, are of increasing concern because of the emergence of antibiotic-resistant strains of staph bacteria such as methicillin-resistant Staphylococcus aureus (MRSA).

Staph bacteria produce a layer of slime that enables them to stick to human tissues and implanted medical devices. In 2002, Jeffrey B. Kaplan, Ph.D., discovered an enzyme that breaks down the staph slime layer. This enzyme, named dispersin B, may be an attractive anti-staph therapy because it disperses aggregates of staph bacteria and renders them more sensitive to killing by host defenses.

Dispersin B not only has the potential to reduce the incidence of hospital- and community-acquired staph infections, but it could also reduce or eliminate the need for conventional antibiotics.

Dr. Kaplan and other members of the New Jersey Dental School Department of Oral Biology have received more than $1.5 million in research funding from the National Institutes of Health (NIH) to study dispersin B, as this innovative work has tremendous potential and multifaceted applications in many disciplines and for many diseases and/or conditions. Dispersin B was named one of the top six discoveries by NIH-funded researchers in 2004 and is scheduled to enter human clinical trials in 2009 as a topical agent for the treatment and prevention of wound infections.

In addition, the NJ Dental School and Oral Biology department have received licensing fees from Kane Biotech, Inc., a small Canadian biotech company that is commercializing the dispersin B technology.

In 2007, Dr. Kaplan received a patent for the "composition and methods for enzymatic detachment of bacterial and fungal biofilms." He also has received a NIH National Research Service Award and is a member of several NIH and NSF grant review panels.

Fred Russell Kramer, Ph.D., Professor, The Public Health Research Institute (PHRI) Center, International Center for Public Health, Newark, NJ

Through his dedication and contributions, Fred Russell Kramer, Ph.D., has made key contributions to basic molecular biology and developed cutting-edge technology that he has parlayed into important commercial applications. Dr. Kramer's work on nucleic acid structure has formed the basis for both important insights into the roles of nucleic structure in molecular interactions that control biological processes, and the development of experimental techniques that provide extremely sensitive and specific molecular diagnostic arrays. His work on RNA-directed RNA synthesis provided seminal insights into the mechanism of RNA replication (ribonucleic acid, a nucleic acid that is central to the synthesis of proteins), and provided the basis for a chain termination method for RNA sequencing that he developed.

One of his most significant achievements, a 16-year commitment, has been the invention of molecular beacons, a technology that has become the basis for the development of highly-sensitive diagnostic assays and methods for visualizing single molecules of RNA in living cells. Some 45 different companies have been licensed to use the technology to detect specific genetic target sequences. Today, most tests for the AIDS virus, HIV-1, that are carried out in Europe and Africa use molecular beacons; most PCR (polymerase chain reaction) tests for methicillin-resistant Staphylococcus aureus performed in North America use molecular beacons; and the lives of hundreds of newborn babies are saved each year through the use of a molecular beacon test that detects the meningitis-causing bacterium, Streptococcus B.

Approximately $23 million in unrestricted licensing income has been received by the Public Health Research Institute, now a part of the University of Medicine & Dentistry of New Jersey, which has been used to support additional research and institutional initiatives.

Dr. Kramer has been exploring nucleic acid structure and its role for nearly 40 years. He has been with the PHRI Center for 22 years, 16 at the Public Health Research Institute in New York City, and six at PHRI since it moved to UMDNJ. He has received numerous U.S. patents and has been honored with the Jacob Heskel Gabbay Award in Biotechnology and Medicine.

Francis Y. Lee, Ph.D., Research Fellow, Bristol-Myers Squibb, Princeton, NJ

In the course of a research career, it is rare that a scientist is involved in the discovery and development of a drug that is approved for the treatment of a disease. For a scientist to be involved in the discovery of two successful drugs is extraordinary. The scientific expertise and creativity demonstrated by Francis Y. Lee, Ph.D., were critical to the identification and development of two new lifesaving cancer drugs: Sprycel and Ixempra.

Sprycel (dasatinib), on which Dr. Lee worked for seven years, benefits patients with chronic myeloid leukemia (CML) and Philadelphia chromosome-positive acute lymphoblastic leukemia (Ph+ ALL). Ixempra (ixabepilone), an 11-year project, benefits patients with metastatic or locally advanced breast cancer. Both drugs provide alternatives to leukemia and breast cancer patients who have exhausted their treatment options; they are approved to treat patients who are no longer responsive to initial therapy with current standards of care (i.e., their cancers are resistant to chemotherapy drugs) or who are intolerant to these therapies.

Dr. Lee's understanding of cancer and his insight to investigate drug resistance, a growing problem among cancer drugs as well as drugs for other diseases, played a key role in tackling the unmet problem of cancer drug resistance, a major obstacle to successful treatment. By leading the biology efforts that resulted in the discoveries of Sprycel and Ixempra, Dr. Lee has significantly improved the lives of cancer patients.

As discoveries and developments by Bristol-Myers Squibb researchers under Dr. Lee's direction, Sprycel and Ixempra are examples of the company's mission to extend and enhance human life. Bristol-Myers Squibb has a rich history in oncology spanning more than 40 years and remains committed to providing innovative therapies to help patients living with a cancer diagnosis.

During his 16 years at Bristol-Myers Squibb, Dr. Lee has been recognized for his scientific leadership with the R&D Council of New Jersey's Thomas Alva Edison Patent Award and with the Bristol-Myers Squibb Ondetti & Cushman Award for Scientific Innovation. He is an inventor with 28 patents and an author on over 100 scientific publications.

Stuart W. Peltz, Ph.D., President and CEO, PTC Therapeutics, Inc., South Plainfield, NJ

Stuart W. Peltz, Ph.D., is an innovator and pioneer, having identified a novel direction in molecular biology and realized its massive potential applications in medicine. His most significant contribution to the field of molecular biology relates to the cellular mechanisms that control gene expression. This work has focused on how the cellular machinery controls the levels of RNA (ribonucleic acid, a nucleic acid that is central to the synthesis of proteins) in the cell. His research shed unprecedented light on the important role that these "post-transcriptional control" processes have on the rate and timing of protein production and their integral importance to proper cellular function.

Following up on his years of research and his passion for cutting edge science, Dr. Peltz developed a strategy of how to discover and commercialize these potential therapies. Ten years ago, he applied his scientific research and insights into the basic science of gene expression as the basis for the platform technology at PTC Therapeutics, a biotechnology company he co-founded. Gene expression remains the major drug discovery platform at PTC.

Since its inception, PTC has grown into a fully-integrated biopharmaceutical company with a broad pipeline of compounds that provide hope for patients with illnesses previously considered untreatable, ranging from genetic disorders to cancer and infectious diseases. Further, Dr. Peltz's achievements in science and academia have been responsible for creating numerous research opportunities in molecular biology and 200 biotechnology jobs in New Jersey to date, with the number still growing as PTC Therapeutics continues to expand.

Under Dr. Peltz's leadership, PTC has set an industry precedent in collaboration with patient advocacy organizations. These partnerships have been instrumental for patients, physicians and researchers to better understand the diseases and form the basis of collaborative partnerships that have fueled additional drug discovery.

As a result of the technologies Dr. Peltz has identified, PTC Therapeutics has engaged in numerous successful research collaborations with the world's leading pharmaceutical companies and secured grants from government agencies and patient organizations, providing financial support for PTC's numerous research programs.

NEW JERSEY'S COMMUNITY COLLEGES

and

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NJIT — New Jersey's Science & Technology University

New Jersey's Community Colleges

Atlantic Cape Community College

Bergen Community College

Brookdale Community College

BCC Burlington County College

Camden County College

Cumberland County College

ECC Essex County College

Gloucester County College

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Middlesex County College

CCM County College of Morris

Ocean County College

Passaic County Community College

Raritan Valley Community College

Salem Community College

Sussex County Community College

Union County College

Warren County Community College

Sidney Pestka, M.D., Professor and Chairman, Department of Molecular Genetics, Microbiology and Immunology, UMDNJ-Robert Wood Johnson Medical School, Piscataway, NJ

Throughout his career, Dr. Sidney Pestka has translated his basic research achievements into practical benefits for mankind. His numerous contributions to a variety of areas in basic research, starting with the genetic code and protein synthesis, often upset scientific dogma and led to new discoveries in chemistry, biochemistry and virology, which paved the way for novel treatments for human disease that were not available before his contributions.

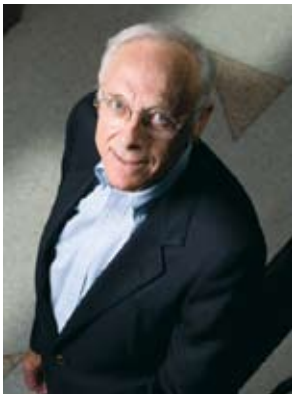
Of Dr. Pestka's many scientific discoveries, most well-known are his pioneering achievements in purifying, cloning and developing the interferons, proteins that regulate the human immune system. Dr. Pestka first isolated human alpha and beta interferons. These proteins are an extremely powerful part of the body's defenses in the fight against cancer and viral diseases. When called upon, cells secrete minute amounts of interferons in order to activate the immune system. Today, the interferons are used for the treatment of viral diseases, such as chronic hepatitis B and chronic hepatitis C, cancers and multiple sclerosis.

Dr. Pestka's pioneering achievements have led to the development of the biotechnology industry, new therapies for a variety of diseases and new technologies for biotherapeutics. Additionally, his work has uncovered several important discoveries in protein biosynthesis to receptor and cell signaling that have contributed enormously to the fields of chemistry, biochemistry, genetic engineering and molecular biology.

Scientists such as Dr. Pestka are the life-blood of a research-intensive medical institution. They represent the highest

quality of scientist that institutions strive to develop and support, and stand as examples, mentors and teachers to the next generation of medical scientists.

Dr. Pestka's achievements have led to his receipt of several awards, including The Harvard University Warren Alpert Prize, the Lemelson-MIT Lifetime Achievement Award, and the National Medal of Technology, presented by The White House. Today, he continues to direct and pursue research in interferons and cytokines; receptors and signal transduction; immunotherapy of cancer; prevention, treatment and control of cancer; and prevention and treatment of viral diseases. He also is actively publishing and patenting through both his academic work at UMDNJ and his company, PBL Biomedical Laboratories.



Aaron J. Shatkin, Ph.D., Director, Center for Advanced Biotechnology and Medicine (CABM)/ UMDNJ-Robert Wood Johnson Medical School/Rutgers, The State University of New Jersey

Aaron J. Shatkin, Ph.D., is a world-renowned scientist who pioneered innovative and revolutionary research in the fields of virus replication and eukaryotic mRNA translation, biosynthesis and metabolism. His seminal work provided a new understanding of the regulation of gene expression in eukaryotic cells and viruses, and his many groundbreaking discoveries have served as the foundation for subsequent important discoveries in transcriptions, translation, mRNA stability and virus replication.

All of this important research has had a major impact upon cell biology and genetic regulation research. The results of Dr. Shatkin's efforts have helped to explain how viruses can alter the cell so as to produce only viral proteins, and ultimately kill the cell.

No one has contributed more to the understanding of the translation initiation and its many-faceted links to other processes than Dr. Shatkin, primarily through his own discoveries, and also through his mentorship over the years of an outstanding group of younger researchers who continue to enlarge and deepen his critical insights.

Dr. Shatkin's stature in science has been affirmed with his election to the National Academy of Sciences, with his receipt of the National Academy's Molecular Biology Award, and with the Association of American Medical Colleges (AAMC) Award for Distinguished Research in the Biomedical Sciences.

Further, under his strong leadership, CABM has grown into a world-class research institute whose members are some of the most innovative and productive scientists within UMDNJ. This has served to strengthen the quality of the intellectual community at UMDNJ-Robert Wood Johnson Medical School and Rutgers.

In addition, Dr. Shatkin continues to publish on a variety of topics including the biochemistry of virus replication and the regulation of eukaryotic transcriptions and translation. He has served as editor and advisory member to a large number of committees and boards across the country. His creativity and vigorous scientific approach led to fundamental discoveries that are already benefiting the scientific community and will continue to do so for years to come.

Margaret M. Wu, Ph.D., Senior Scientific Advisor, ExxonMobil Research & Engineering Co., Annandale, NJ

The picture of a female researcher studying motor oil might be difficult to imagine. But Margaret M. Wu's career in Mobil and ExxonMobil research organizations has included experience in catalysis, process chemistry and lubricants that laid the foundation for a continuing flow of major contributions in petrochemicals, polyolefins and synthetic lubricants.

A major commercial success evolved from Dr. Wu's discovery of a new class of synthetic base stock, SuperSyn™, which is featured in a breakthrough new Mobil 1 lubricant, one of ExxonMobil's flagship products. Dr. Wu also was a key participant in a team effort to bring SuperSyn to successful commercialization.

This new class of lubricant fluids contributes significantly to wear protection, improved energy efficiency, more reliable operation and reduced used oil generation by extending oil life, thereby positively impacting society through reduced waste, lower emissions and energy conservation.

Dr. Wu currently heads ExxonMobil's synthetic base stock development effort and is widely consulted by many business groups within the company. Her expertise in synthetic fluids, petrochemicals and catalysis also is recognized outside the company, and she is frequently invited to write papers and make presentations in these areas.

Dr. Wu is a strong supporter and mentor for younger technical staff and has a solid record for supporting women scientists at work. She is a founding member and champion of the Clinton Woman's Interest Network (CLNWIN), and is active in many professional organizations, including the American Chemical Society-Petroleum Chemistry and Polymer Science sections, Chinese American Chemical Society, Society of Automobile Engineers and Society of Tribologists and Lubrication Engineers.

She has received the prestigious ExxonMobil Outstanding Patent Award for Commercial Success and the ExxonMobil Chemical Global Technology Award, among other internal awards, and has been recognized with the New Jersey R&D Council's Thomas Alva Edison Award and the ACS Industrial Chemical Award "for her discovery and successful commercialization of new synthetic fluids with step-out performance and positive economical and environmental impact, and for her technical leadership role in ExxonMobil organizations."