The Monell Connection

Monell: 30 Years of Connections

It started relatively inauspiciously...
a handful of young scientists working in a warehouse in Philadelphia. But it was a big idea — to create the world’s first scientific institute for multidisciplinary research in the chemical senses. With the vision of Dr. Morley Kare and others, along with initial financial support from the Ambrose Monell Foundation and numerous other sources, the Monell Chemical Senses Center was founded in 1968 to explore taste, smell, and chemosensory irritation — from the molecular level to the realm of human behavior.

Over the past 30 years, several hundred scientists have passed through Monell’s doors, building careers in academia, government, and industry. We contacted a number of these scientists, some of whom were on hand at the very beginning, to find out where their careers have led, and what part Monell played in their journeys. Monell has grown enormously, and an explosion in technology has greatly transformed the way we do science. What hasn’t changed in 30 years is the enthusiasm and commitment to basic scientific research evident throughout Monell.

John Kauer, Ph.D.
Professor of Neurophysiology
Tufts University

John Kauer was there at the beginning. One of Monell’s first graduate students, Kauer remembers the happy day in 1971 when the Monell staff was able to leave its “temporary” quarters of almost three years — a group of trailers set up behind the VA Hospital and a loft in a warehouse in central Philadelphia — and move into sparkling new facilities.

During his years at Monell, Kauer used the salamander as an animal model to study...
neural activity and behavioral reactions to odors. “At Monell, there are scientists working on the molecular biology of receptors, all the way up to studying the behavior of humans,” Kauer states. “That kind of eclectic approach to understanding the sense of smell was very much an influence on me.”

The work that Kauer began at Monell shifted to collaborations at Tufts University, where he currently serves as professor. Kauer has been instrumental in developing an artificial olfactory system, which may soon be available commercially. “We take the principles we obtain in the biological system and implement them in an artificial network to discriminate odors,” he explains. Kauer recently had the opportunity to demonstrate the “artificial nose” to his former colleagues when he returned to accept the 1998 Manheimer Award, given by Monell to note career achievements in the chemosensory sciences.

Marilyn L. Getchell, Ph.D.
Professor of Anatomy
University of Kentucky College of Medicine

Marilyn Getchell was just establishing the protocol upon which her thesis research would be based when she was recruited by Dr. Morley Kare and Dr. David Moulton to join in creating a new research center. Somehow, she managed to convince Northwestern University to let her conduct her research at Monell. Thus, Getchell joined the ranks of young scientists at Monell, attracted by “Dr. Kare’s exciting vision of a center for interactive research and by the opportunity to work with some of the most progressive scientists in chemosensory research.”

Currently, Getchell is professor at the University of Kentucky College of Medicine along with her husband Tom — also a Monell alumnus. Their research centers on numerous aspects of olfaction, including cellular and molecular changes in the human olfactory mucosa as a result of aging and Alzheimer’s disease.

Getchell cites the mentoring of Monell’s senior scientists as the strongest influence on her career. She recalls, “Dr. Kare’s abilities to attract industrial support for chemosensory research and his encouragement of the interaction between Monell’s basic science researchers and the scientists representing Monell’s industrial sponsors broadened my perspective on the applied scientific and industrial applications of research in the chemical senses.”

Judy Wellington, Ph.D.
President
New Jersey Aquarium Foundation

In an understated way, Judy Wellington refers to her career as “eclectic.” She came to Monell in the 1970’s to pursue post-doctoral work in organic chemistry and stayed for a decade, serving in a number of roles at the Center. Planning Monell’s new animal facilities led to a position with the Philadelphia Zoo and eventually Wellington was appointed to help oversee the design and construction of the New Jersey State Aquarium. She was involved in all aspects of the aquarium’s organization, and ultimately became its Chief Executive Officer.

Monell provided Wellington with her first administrative experiences, when she worked for two years as assistant to Dr. Morley Kare. “When I first came to Monell, I was interested in being a chemist,” she explains. However, when presented with the opportunity to serve in an administrative capacity, Wellington found a new calling. Her position at Monell paved the way for the extremely complex tasks that would soon come her way. “I was very happy at Monell, but the aquarium presented an opportunity that is not given to many people in a lifetime. To build an institution from the ground up was something I couldn’t turn down.” She adds, “Monell provided an example of how an idea can be turned into a reality.”

Michael Naim, Ph.D.
Professor of Nutritional Biochemistry
The Hebrew University of Jerusalem

When Michael Naim came to Monell from Israel as a postdoctoral fellow in 1974, just months after serving in the Yom Kippur War, it was the first time he had traveled overseas. Naim’s thesis supervisor in Israel was impressed with the work being done at Monell, and urged him to consider Monell to gain expertise in an area that was not readily available in Israel. The warm greeting Naim and his family received from the Monell community and the research interests he subsequently developed have stayed with him to this day.

A nutritional biochemist, Dr. Naim’s current research explores cellular signal transduction mechanisms in taste and the chemical pathways of flavor formation. Although his experiments have shifted to the molecular level, the early training he received at Monell has contributed directly to his work at the Institute of Biochemistry, Food Science, and Nutrition at Hebrew University. Dr. Naim has twice returned to Philadelphia to spend a year at Monell as a visiting scientist. “I had the privilege to be part of the early phase of the Center’s development, and to explore a new research area.” Naim says. Although his scientific experience at Monell was obviously formative, Naim also points to the interaction with scientists and industrial sponsors and the social atmosphere as being particularly rewarding aspects of Monell. He notes, “We enjoyed so much being at Monell and in Philadelphia that for me and my family, these places will always be like a second home.”

Carol Christensen, M.B.A., Ph.D.
Director, Global Technology Consumer Research
Colgate-Palmolive Company

Although Carol Christensen has spent much of her career studying human behavior, she chuckles when she remembers her own behavior on the day she interviewed for a position at Monell. It was St. Patrick’s Day, 1975. Following a grueling day of interviews,
Dr. Kare took Christensen out to dinner. “I didn’t have any idea what a gourmet Dr. Kare was, and I remember him looking very distressed to see me drinking with great relish the green champagne the restaurant was serving!”

Christensen got the position — green champagne notwithstanding — and came to Monell to study the psychological and physiological mechanisms of appetite. “Monell was very appealing to me because the collaboration with scientists of different disciplines was made so easy,” Christensen recalls. Her plan was to conduct studies on the sensory controls of feeding behavior through studies of brain function. However after several years, an intensifying allergy to rodents prompted her to switch to investigating human taste perception. For the rest of her stay at Monell, Christensen focused on the perception of food texture, food texture-taste interactions, and color-taste interactions, as well as researching the role of saliva flow and composition in human taste perception.

After earning an MBA at Temple University’s night school, Christensen took her expertise to industry. She says, “Had it not been for Monell, I would never have contemplated a career in industry nor have seen how my influence in his life. When he was a high school student in Philadelphia, Glendinning spent a summer as an intern at Monell to conduct a seminar on plasticity. “It was wonderful to be back,” he says, “Over the years I have continued to feel a connection with the people there.”

John Teeter, Ph.D.
Assistant Professor
of Biological Structure
Barnard College

John Teeter’s long-standing association with Monell began at the beginning, and is still going strong. He arrived as a graduate student in 1969 to do his doctoral work on the cellular mechanisms of taste transduction, using the catfish as a model system. After leaving Monell to complete a postdoctoral fellowship in New York, Teeter turned down several attractive job offers to return. He’s been at Monell ever since.

“Monell was very active, both scientifically and socially, in the early 70’s,” Teeter recalls. “We were a new and by no means established institute with a young, bright staff just beginning to build careers.” One of the enduring aspects of Monell that Teeter still appreciates is the value placed on broad interests and the collaborative exploration of new ideas and lines of research. Over the years, he has worked on projects ranging from the cellular and molecular mechanisms of both taste and olfactory transduction, to behavioral mechanisms of chemosensory orientation in sharks and catfish, to pheromone communication in sea lampreys. Still, Teeter insists that by far the most important and enjoyable part of his extended stay at Monell has been his interactions with the large number of colleagues, collaborators, and students that he has met through Monell. “Although they are now scattered all over the world, many still work in the chemical senses, and all remain good friends,” Teeter says.

Dwight Riskey, Ph.D.
Senior Vice President,
Global Marketing
Frito-Lay, Inc.

Dwight Riskey’s association with Monell began when, as a newly minted Ph.D. at UCLA, he was invited to give a brown bag seminar at Monell on cognitive information processing and perceptual impression formation — subjects he describes as “having only the most tangential relationship to the perceptual processes of taste and smell.” But it was a seminar that would change Riskey’s life. “It was an almost magical experience for me, as I could sense a real connection with the staff,” Riskey recalls, “and I found myself driving with my wife and two small children from Los Angeles to Philadelphia in 1978 for the biggest adventure of our lives.”

Trained as a psychologist with a specialty in psychophysics, Riskey remembers that his colleagues at Monell were “willing to grant me my naïve flights of academic fancy on the bet that my background would provide a fresh and unique perspective on the field.” He was drawn to Monell’s collaborative and collegial atmosphere while conducting research projects ranging from biochemistry to psychophysics. Riskey explains, “Life at Monell was all about a common quest to do good science. It was a lofty and aligning goal, and we celebrated each other’s successes and worked hard to assure mutual progress.”

Although his stay at Monell lasted only two years, its impact was tremendous. Not surprisingly, major food corporations were quite interested in Riskey’s research into how people develop taste preferences, leading him to a successful business career. Riskey has built his career on the clear thinking and scientific principles he employed at Monell, and comments that even in the corporate world, he still thinks like a scientist.
Adaptation

For one Monell scientist, the sky is the limit...

Pamela Dalton is a prime example of what it takes to be a successful scientist in today’s world, and she is typical of the breed of investigators attracted to the varied opportunities available at Monell. Dalton is many things: head of an active scientific research team, educator, community activist, and sought-after lecturer. So how does she think of herself? “Becoming a successful scientist these days is like running a business. You have to utilize good management skills in order to juggle all the different demands on your time.”

And juggle she does. Luckily, she’s adaptable, because Dalton currently has ten major research initiatives either in progress or on the drawing table, keeping her team of assistants busy in both the lab and the field. In her five years at Monell, first as a postdoctoral fellow, and currently as an Assistant Member, she has been involved in endeavors ranging from olfactory effects of solvent exposure on workers in the textile industry to investigation of the repellent effects of odorants. Dalton’s projects span a variety of scientific disciplines, frequently involving collaborations with scientists at Monell and elsewhere. At the core of her work is the study of olfactory adaptation — how humans acclimate to odors, particularly over an extended period of time.

The seed of Dalton’s research interest was planted years ago when she read an article written by a journalist who was present when a crew of astronauts disembarked from the Space Shuttle. The journalist reported that when the shuttle door opened, a terrible smell wafted out, causing her to throw up at the feet of the crew. They, on the other hand, seemed unfazed by the shuttle’s odor.

The image left its mark on Dalton: “The olfactory system is truly amazing. Here you have people living in conditions that cause other people to vomit, and they’re just not perceiving it. What kind of a system could produce adaptation that specific yet that profound?” Seeking answers to this question, Dalton came to Monell in 1993 after earning her doctorate in experimental psychology at New York University to work with Dr. Charles Wysocki, who was interested in some of the same issues.

And in one sense her career has come full circle, as she now anticipates being part of a project to develop more effective odor-reduction techniques for the SpaceLab. The goal is to build a behavioral testing station for the SpaceLab that could allow astronauts to conduct experiments on rodents. Dalton says astronauts have so far refused to fly on missions that include mice, who produce particularly pungent urine. Using Monell’s recently-constructed environmental chambers, Dalton and her research team hope to assess
Lab to Real Life

Pamela Dalton, Ph.D.

Adapting to chronic background odors is also the subject of a long-term study Dalton is conducting in South Camden, New Jersey, a community with a long history of complaints of industrial odor pollution. Dalton examined the prevalence of reported odors and their relationship to reports of annoyance, sensory irritation, health symptoms, and behavior among residents of South Camden. “There was something very compelling about going out in the field every day, testing people that were coming in with real-world complaints and talking about the problems in their neighborhoods,” Dalton says. The study involved residents who live near a sewage treatment plant in South Camden and also those living in a neighborhood in North Camden that faces many of the same urban problems, but is not exposed to a constant cloud of industrial odor.

“We are interested in how, once an odor is smelled, information about that odor is interpreted with regard to personal health. When an odor informs individuals that they are being exposed to a chemical, they often begin to monitor health-related attributes, heightening anxiety and stress levels.”

The results were interesting to Dalton from several perspectives. “When rating the intensity of sewage plant odors, people who lived near them tended to rate the lower concentrations of those odors as much, much weaker, and some couldn’t discern them at all,” she explains. There are many questions yet to be answered about how this adaptation occurs. “Are the receptors responding less because they have been chronically exposed or is there some part of the brain that filters out information intentionally, much as what happens to people who live on a noisy street and learn to filter out the noise of traffic?”

Dalton’s research in the lab indicates that people do indeed become less sensitive to compounds that they are exposed to on a regular basis, either in their occupational setting or in a residential environment.

Some of Dalton’s experiments are directed at understanding how people react to odors and irritants on a physiological level. She measures heart and respiration rates, stomach contractions, and electrical signals and blood flow in nasal tissue. However, as a result of her training as a cognitive psychologist, Dalton is particularly attuned to the psychological aspects of a subject’s response to an odor. One of her current protocols addresses non-sensory factors in odor perception by exposing different groups of people to the same chemical odor but giving them different hypothetical scenarios about the source of the chemical.

“We’ve done this with more than a dozen compounds, so it’s not specific to any one chemical,” Dalton explains. “The major variable appears to be what people think the source of the odor is and whether they believe it is a risk to their health.”

“It’s very exciting for me to be able to use the new environmental chambers that we have constructed here at Monell, study people’s behavior and responses to chemicals, and then use that information to help people understand how to deal with the problems that odors produce in the outside world,” Dalton says. The ability to engage in that kind of research is one of the reasons she believes scientists thrive at Monell. “Scientists today have to spend an inordinate amount of time talking to people about projects and writing grants and papers, but at Monell we are still able to connect to what’s going on in the lab. For most of us, that is what got us so excited about science in the first place.”
the U.S. but throughout Europe, Japan, and in South Africa. These multinational connections insure a continual influx of visitors to Monell from around the world and, luckily, provide opportunities for Monell scientists to travel abroad.

The Center itself is also international in its scientific staff. Over Monell’s 30 years of existence we have had staff or visiting scientists from nearly 30 countries. Today working at the Center are scientists from Canada, China, the Czech Republic, England, France, Japan, Morocco, Pakistan, the Philippines, Russia, and the Ukraine, as well as the U.S. These international interactions enrich the science we do and, as part of our training mission, provide alumni and good will ambassadors who are now scattered throughout the world.

Our activities are related to the clear internationalization of the scientific enterprise itself. More and more scientific meetings are being held around the world, and many of us collaborate closely via fax and email with scientists in different countries.

Monell’s trajectory is toward further expansion of international activities. First, the science itself continues to expand beyond national borders. Excellent science and scientists can be found throughout the world, so it behooves us all not to limit our sights even to Europe, North America, and East Asia — or to the English language. Second, we are seeing a very strong trend for postdoctoral applicants to come from foreign countries. The reasons are complex and have been discussed by others but a consequence of this is the almost inevitable further expansion of the international scope of our scientific staff. Third, we anticipate that there will be a growing number of international companies that will join our sponsors program, and even among those already working with us we see increased focus on international markets. Finally, I personally believe that there should and will be even more collaboration with scientists in different countries that include exchanges in both directions. This will be good for the Center, good for the scientists, and good for science.
The worlds of industry and academia have often been viewed as mutually exclusive and somewhat adversarial. Not at Monell. In fact, industrial sponsors have played an important role in Monell’s development from the start, and Monell scientists have proven to be a valuable resource for corporations throughout the world and across many disciplines.

When industry, along with government and foundations, joined with academia to found the Monell Center 30 years ago, such a collaboration was quite unusual. Indeed, some in academia’s ivied walls were suspicious. But because Monell presented a unique opportunity, several companies agreed to provide short-term financial support as well as critical advice and guidance. It is remarkable that virtually all of those initial corporate sponsors, some competitors in the marketplace, still stand behind and support Monell’s mission.

The number of companies now providing financial support to Monell through corporate sponsorship has grown to more than 50, although these funds still account for less than one-third of the Center’s budget. Unlike government grants — which constitute Monell’s major funding source — sponsorship funds are unrestricted, providing the flexibility that permits the Center to initiate new programs, hire new staff, and provide bridge support for more senior faculty.

The range of enterprises that support Monell as sponsors is extraordinary. From huge multinational corporations to small start-up businesses, they span the globe, including companies in Europe, the Far East, and South Africa. Although all obviously have a business interest in the chemical senses, their specific concerns vary from foods to fragrances, industrial chemicals, personal products, and over-the-counter drugs.

Equally as diverse as the size and location of Monell’s sponsors are their reasons for providing financial support to a basic research institution. A primary goal is access to a dynamic group of research scientists encompassing a broad range of interdisciplinary approaches to understanding the mechanisms and functions of the chemical senses. Representatives of sponsoring institutions have access to the latest findings in the field, including as-yet-unpublished work conducted by Center scientists. Several formal meetings are held at the Center each year to bring sponsors up-to-date on results of Monell’s research. In addition, much smaller roundtable dialogues are conducted, often on a confidential basis. The focus of these exchanges, and of one-on-one discussions, can range from tutorials on basic mechanisms to in-depth explorations of problems dealing with specific ingredients. Corporate sponsors also have first rights to evaluate and license Monell’s intellectual property.

Collaboration on projects of mutual scientific interest has increased in recent years, although the Center is not a contract research laboratory and conducts no direct product research. However, it has become increasingly clear that there are projects that have both basic and applied components, and the Center now has a substantial number of research agreements with companies that are corporate sponsors.

Unlike the stereotypical “us versus them” relationship of academia and industry, Monell and its sponsors have worked hard to create an arrangement that is unique and beneficial to both.

Monell sponsorship is not a one-way street. Individuals from sponsoring organizations also provide Monell scientists with insights into real-world problems that can easily be missed in academia. They contribute a different and valuable perspective both formally, as members of various advisory boards to the Center, and informally, a result of the close personal collaborative relationships that develop. Furthermore, sponsors also frequently make available specialized equipment and supplies for use in research projects at Monell.

Over the years, substantial numbers of Monell-trained scientists have gone on to positions in the laboratories and corporate offices of our sponsors. This provides yet another valuable resource for sponsoring companies. And, the Center welcomes visiting scientists from sponsoring companies for training and collaborative work. These interchanges bring a personal dimension into the relationships, serving to further cement the already strong bridge between two worlds with a common interest in the chemical senses.
Monell has a growing presence in the popular media both nationally and abroad. Less visible to the general public, but perhaps more importantly, Monell and its scientists continue to be well represented in numerous professional publications. This track record in publishing is just one measure of Monell’s remarkable success. The diversity of the journals in which staff members have published speaks to the breadth of the research being conducted at Monell, as well as to the wide audience we reach.

Since the Center’s founding, Monell scientists have published nearly 1,100 articles in almost 300 journals and more than 325 chapters in scientific books. Those statistics are steadily increasing, reflecting growth in the number of scientists working at the Center, and increased productivity of Monell’s scientific staff. Among the journals in which Monell scientists have published papers are widely-circulated ones such as Nature, Science, the New England Journal of Medicine, JAMA, Neuron, and the American Journal of Physiology. In addition, Monell publications appear in various specialized journals, including Chemical Senses, Appetite, Brain Research, the American Journal of Clinical Nutrition, the Journal of Chemical Ecology, and Behavior Genetics. The Center also maintains a high visibility in trade journals, such as Food Technology and Perfumer & Flavorist.

A complete bibliography of Monell’s publications from 1969 to the present is available upon request.

Publications Provide a Window onto Monell’s Broad Reach