



Setting the course for excellence

BY ELISA LUDWIG

Michael Klein's enduring influence at CST—on teaching, advanced research, and support for students, faculty and staff—will leave a lasting legacy.

As dean of the College of Science and Technology for more than a decade, Michael L. Klein, FRS, led the college through a period of critical transformation. This year, he moves on from that role as he continues to pursue advanced research at Temple University.

Trained as a chemist, Klein has built an impressive body of interdisciplinary research, first bridging from chemistry to physics, then touching on chemical engineering and bioengineering, and more recently through biophysics to medicine. Klein was an early pioneer of using computer simulations to look at the behavior of molecules in complex systems and his work has been highly influential, with almost 117,000 total citations over his career and more than 700 articles with at least 10 citations each. His Hirsch-index, $h = 128$, is a measure of both impressive productivity and citation impact.

Klein's extraordinary career includes membership in the U.S. National Academy of Sciences and the World Academy of Sciences and as a Fellow of the Royal Society (FRS), whose members have included Isaac Newton and Albert Einstein. At the same time, Klein has honed a passion for teaching at several institutions including the University of Pennsylvania, before arriving at Temple in 2009.



Establishing research centers

Early on, Klein set out his priorities for CST, including a strategic plan for strengthening its research capabilities. Central to this plan was the development of new institutes and centers of excellence to drive research in emerging areas. Under Klein's leadership, a dozen institutes and centers of excellence were created. He also oversaw the final development and completion of the Science Education and Research Center in 2014, which is home to many of these research entities as well as teaching labs and classrooms.

"The centers serve as attractors for like-minded faculty, and even more importantly, their affiliated students and post-doctoral researchers," Klein says. "The latter offer undergraduate research experiences, potentially more rewarding than working with an isolated faculty member. Institutes and centers of research excellence often generate new topics for the undergraduate curriculum, new courses at the graduate level and new master's programs."

Building scholarly excellence

Among the emerging academic subject areas CST invested in during Klein's tenure as dean are high performance computing, evolutionary biology and functional genomics.

"These are now the research areas in which we are considered excellent, and they have become big areas of research around the world," says Sudhir Kumar, Laura H. Carnell Professor of Biology and Computer and Information Sciences and director of the Institute for Genomics and Evolutionary Medicine.

These investments had a cascading effect, says Kumar, heightening Temple's profile as a top research university, expanding CST's research funding portfolio and enabling the college to offer new undergraduate degree programs. For example, genomic medicine was one of the first of its kind in the nation and has seen strong enrollment growth since launching several years ago. "Students can now pursue cutting-edge careers that were not possible without the recruitment and investments that were made by the college," Kumar says.

Making research accessible

Klein also recognized that preparing students for STEM careers does not begin and end in the classroom, but must also encompass hands-on opportunities for conducting research. He nurtured the college's Undergraduate Research Program, now known as the CST Research Scholars Program (CST-RSP).

"Mike understands that undergraduate research is not only something that qualifies you for your career or for advanced study or for professional school. It's actually a pathway to graduation," says Susan Jansen Varnum, senior associate dean for undergraduate affairs, science education and community engagement. "As an undergraduate researcher, you immediately have a set of colleagues, people who are like minded, who will teach you skills and support your work."

Interest in research has exploded in recent years, she says, with up to 160 undergraduates pursuing CST-RSP projects each year. Many more are working on research through the Science Scholars Program for incoming students and sophomores, research opportunities available through CST's six academic departments and summer and international research experiences. "Research is not for the select few," says Varnum. "It's for the many, and Dean Klein has made that a reality for our students."

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Attracting top talent

Developing an exceptional research institution requires the consistent recruitment and retention of top faculty with high research impact. Klein focused his efforts on attracting promising assistant professors that either brought new research directions or helped bridge existing areas of expertise in the college, allowing for multidisciplinary collaboration.

Sudhir Kumar was one such recruit, brought to Temple from Arizona State University. He was impressed by many things about CST, but he was especially drawn to the school's vision for collaborative research efforts—in his case, combining computation, biology and medicine in the context of studying evolutionary changes to DNA.

Engaging with undergraduates

Even as he was spurring major growth in Temple's research areas, Klein remained committed to undergraduate students and improving the student experience.

"Dean Klein stayed personally involved in the undergraduate life of Temple, whether that was showing up for a Saturday Experience Temple Day, welcoming new students or playing cornhole at Convocation," says Ann Valentine, professor of chemistry and department chair.

Recognizing that science education at the university level faces numerous challenges, including students arriving to campus underprepared for science majors, Klein supported the creation of a new student seminar in 2019, a requirement for every incoming freshman at CST.

"There was an initial challenge of getting some faculty to understand the value of the course," says Tom Price, assistant dean of advising and student success. "Dean Klein took the initiative and agreed to teach it himself. To take the time and energy from all of his other obligations and connect with first semester students was beyond fantastic."

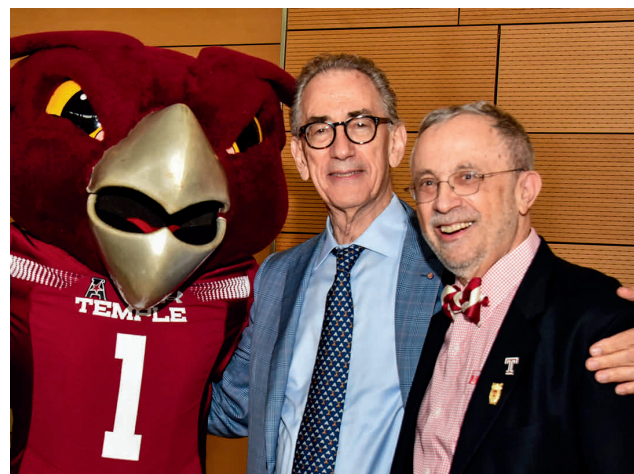
Not only did students have the rare opportunity to interact with the dean in 20-person cohort groups, but he set a powerful example with this act of leadership, says Varnum. "When a National Academy member and a fellow of the Royal Society is teaching a freshman seminar, that inspires other faculty to join in."

Supporting community initiatives

Klein promoted strategic outreach and community engagement efforts, such as programs aimed at middle and high school students from North Philadelphia and throughout the region, to spark interest in fields related to STEM and help demystify the path to higher education.

"He put as much effort and energy into that as he did into his own research and teaching," says Varnum. "He just has this huge commitment to the students and student communities."

For many, Klein put the mission of the college into action and in doing so expanded the reach of Temple's STEM programs. "We now offer quite a variety of educational activities, not only benefiting undergraduate and graduate students at Temple, but also pre-college students from local communities," says Hai-Lung Dai, Laura H. Carnell Professor of Chemistry and a former CST dean himself.





Setting the example

CST faculty and staff recognize Klein's contributions to the college and his focus on encouraging growth, providing opportunities, mentoring where needed and building trusting relationships.

"When I first came to interview here, it was already clear that he was someone important and a leading figure in the college. Later, when I was vice chair, he was a tremendous partner in listening to what we needed and being responsive to what would grow the department and keep us robust and healthy," says Valentine.

CST faculty expect to see Klein's legacy live on in his innumerable contributions to the college. "Michael Klein is a true academic leader—he was able to recruit top scholars and guide the process of tenure and promotion of faculty in CST. He has been devoted to education at all levels," Dai says.

"Michael Klein embodies the finest attributes of the academic scholar: incisive intelligence, collegiality and dedication to education," says Barry C. Arkles, CST '70, '76, a Temple University Trustee and a member of the CST Board of Visitors. "Coupled with strong humanism, sense of humor and the active engagement with local and global scientific communities, he has built a reputational legacy for himself and Temple's College of Science and Technology."

Getting back in the lab full time

Even while serving as dean, Klein continued to make important discoveries in his field, and he is looking forward to devoting more time to his research.

"It has been a privilege to serve as dean of the College of Science and Technology at Temple University for the past 10 years," says Klein. "I was motivated by the desire to enhance the reputation of the college and provide all our students with a valuable educational experience."

He has funding for his research lined up for the next several years and he remains active both nationally and internationally, serving on advisory panels and organizing international scientific conferences.

In the meantime, he envisions that the work in many ways has just begun: STEM education will play a major role in ensuring a more sustainable future for planet Earth.

"CST has embraced this challenge and started by creating new cross-school initiatives, new cross-department programs and new majors, such as ecology, evolution and biodiversity," explains Klein. "Notably, we are only at the very beginning of this journey. Designing an optimal path forward for this important challenge will be one of the tasks awaiting the new CST dean." ■