

Building for Science

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DEAN'S COLUMN

One of the pleasures of being dean of the School of Arts and Sciences is that you learn something new every day. As our name denotes, the School encompasses the full spectrum of academic disciplines — the humanities and the natural and social sciences. What that requires of a dean is considerable stamina, a sense of intellectual curiosity and a willingness to take up the challenge of understanding a wide span of fields covering everything from poetry to populations to proteins.

As an English professor stepping into this role, I knew from the start that I would be responsible for a high-stakes and immensely important part of the School's mission, the sciences, even though my expertise is in the humanities. Over the last two years, I've worked with our scientists and science chairs to gain a firmer grasp of the issues they face. They have taught me a great deal about science and its past, present and future. It's been an absolutely fascinating journey and one of the most rewarding aspects of my job.

Our strategic plan calls for targeted investments in five multidisciplinary initiatives. Two of them are in the sciences: nanoscale research and what we've come to call genes to brains to behavior. Both areas of research

are rich in the promise of breakthroughs in fundamental knowledge and world-changing applications. Recognizing that the School of Arts and Sciences is well positioned to move forward in these areas, we are embarking on an ambitious plan to build two new facilities: a nanoscale research building and a neural and behavioral science building. These buildings will allow us to recruit and retain the very best scientists and to educate a new generation, working closely with those faculty.

The School is fortunate to be able to leverage the University of Pennsylvania's depth of resources and strong culture of collaboration in the physical and life sciences. Faculty from the School's diverse academic departments and the University's other schools are already working together, using some of the latest tools of science to take on challenging problems and questions.

In her laboratory, biology professor Nancy Bonini introduces human-disease genes into the fruit-fly genome to study how devastating neurodegenerative illnesses like Alzheimer's and Parkinson's attack the brain. Nancy carries out close research collaborations with investigators from the Department of Pharmacology in the School of Medicine. Clinical researchers and R&D scientists from drug companies sometimes contact her for advice on treatments they are developing.

With technologies that allow us to push around individual atoms, nanoscientists can now build "machines" measured in millionths of a millimeter. Together with faculty from the School of Engineering and Applied Science, physicist Charlie Johnson has created tiny sensors that can detect single molecules in the environment. The minuscule device is made of a carbon nanotube, whose wall is one atom thick, and a single strand of DNA. His nanosensor can sniff out molecular traces of explosives or bioweapons and might even have a future role to play in detecting protein byproducts of cancerous growths.

Detailed brain-imaging technology, a deeper understanding of the genetic origins of human behavior, new techniques to build molecule-size machines with atoms as building blocks — these remarkable tools and theories hold the promise of breakthrough discoveries that couldn't have been imagined just 20 years ago. With the kind of basic research our scientists carry forward every day — their ceaseless pushing at the frontiers of the unknown — the School of Arts and Sciences can make a vital contribution. ■

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