CHALLENGING STIGMA

In Ancient Greece, citizens would occasionally assemble in public, each bearing a shard of pottery known as an ostracon. These jagged objects acted as ballots in an unusually solemn election that decided the fate of a particular person, who would be exiled—ostracized—from the community should the vote go against him.

While such complete community banishment is rarely practiced in modern society, individuals belonging to various groups are often set apart from others through stigmatization. The process is a complex one, and a focus of research for IIT Professor of Psychology Patrick Corrigan.

Corrigan came to the study of stigma through his long-term involvement with rehabilitation psychiatry. For more than a dozen years, he directed the University of Chicago's Center for Psychiatric Rehabilitation. More recently, he became chief of the Joint Research Programs in Psychiatric Rehabilitation at IIT.

Corrigan has found that those with mental illness are often prime candidates for stigmatization, which can cause the person to avoid treatment, hamper treatment once it has begun, exacerbate symptoms, and increase the daily challenges patients face.

Unfortunately, Corrigan says, mental illness continues in many places to be viewed as a social problem rather than as a serious health concern. Those afflicted with mood disorders, autism, schizophrenia, or substance abuse issues may be singled out for ridicule and—as Corrigan stresses—for blame. Further, people with serious mental illness frequently adopt society's prejudices toward their afflictions in a process known as self-stigmatization.

One focal point of Corrigan's work has been finding adequate housing and meaningful employment for those suffering the stigma of mental illness. In a recently completed five-year study initiated in 2003, Corrigan compared employer attitudes toward the mentally ill in a cross-cultural study of three cities: Chicago, Hong Kong, and Beijing.

Corrigan stresses that results of his research on cross-cultural stigmatization are preliminary, though his hunch is that while stigmatization is ubiquitous, modes of operation are probably culture-specific. "There may be a big difference between Asian and Western European ways of looking at this issue," he observes, "because it represents a collectivist versus individualist cultural viewpoint."

In each city, 300 employers were identified, representing six key business sectors: manufacturing, education, health care, high tech, low tech, and business office work. The three-city survey examined degrees of mental illness stigma, comparing these with employer perceptions of other stigmatized groups, specifically, those with HIV/AIDS or substance abuse. As a control, Corrigan also examined attitudes towards victims of bone cancer, who typically are not stigmatized.

Corrigan found that substance abuse cases tend to be the most severely stigmatized in all three cities, followed by schizophrenia, HIV, and lastly, bone cancer. Stigmatization appeared to be similar in severity regardless of the work sector examined. Pending more complete data analysis, the results will be used to fine-tune programs to combat workplace stigmatization within each culture.

He views stigma as a fundamental issue of societal injustice. An irrational fear of contagion—either moral or physical—often lies at the core of the problem. Corrigan insists the most effective conditions for counteracting societal stigma and overturning preconceived notions occur when the public comes in direct contact with those harboring a harmful stereotype.

Corrigan's in-depth investigations of stigma have appeared in numerous academic papers as well as in his book, *Don't Call Me Nuts! Coping with the Stigma of Mental Illness.* Much of his ongoing research is carried out under the auspices of the Chicago Consortium for Stigma Research (CCSR), for whom he is principal investigator. CCSR is funded by the National Institute of Mental Health, features behavioral and mental health services researchers from seven Chicago area universities, and is currently engaged in more than 10 interdisciplinary projects.

—Richard Harth

HEART OF THE **MATTER**

μCoSM
CENTER FOR MOLECULAR STUDY
OF CONDENSED SOFT MATTER

Condensed soft matter is as amorphous as its applications are infinite. Generally defined as solids or liquids that are non-crystalline, soft matter includes colloids, liquid crystals, and molten polymers, and appears in everything that is sticky, slimy, squishy, and gooey—from rubbers and adhesives to paints and fuel additives.

Soft matter is also ubiquitous in living tissue, which makes its study key to understanding the behavior of living systems under conditions of trauma or stress. This is the central focus of the interdisciplinary IIT Center for Molecular Study of Condensed Soft Matter (μCoSM).

Professor of Chemical and Biological Engineering Jay Schieber, Professor of Physics Larry Scott, and Marco Saraniti (now at Arizona State University) founded the center in 2007, marshaling a cross-disciplinary team to investigate theoretical and computational aspects of both synthetic and biological condensed soft matter. Since then, other experts in experimentation have joined them, including Assistant Professor of Biology Joseph Orgel, Professor of Chemical and Biological Engineering David Venerus, and Associate Professor of Chemical and Biological Engineering Victor Perez-Luna.

"μCoSM was put in IIT's University Technology Park to encourage the sort of multidisciplinary projects that could come from people in electrical engineering, chemical engineering, biological engineering, biology, and physics," says Schieber, center director. The center's computational facilities include a new 256 CPU computing cluster, and μCoSM recently joined IIT's Pritzker Institute of Biomedical Science and Engineering.

The behavior of condensed soft matter is complex and tricky to adequately model and predict. Such material has the capacity to self-organize at the mesoscopic level—that is, within a broad range spanning from the atomic to the macroscopic level, the latter observable without the use of a microscope. Further, soft matter often displays a curious, time-dependent quality not found in other types of matter. This allows it to respond over intervals ranging from milliseconds to minutes or even longer, when subjected to deformational stress. Schieber explains this property, known as viscoelasticity, by the behavior of a rubber band. "If I take a rubber band and I stretch it," he explains, "the tension in the rubber band can take many days to reach a constant value."

The wide range of length scales that must be addressed, from the atomic to the macroscopic, makes the group's research particularly challenging. Each μCoSM researcher contributes expertise at specific points along the way. Orgel examines the structure and behavior of viscoelastic fibrous networks such as collagen via X-ray diffraction experiments conducted at Argonne National Laboratory. The resultant data is then applied to atomic-level simulations aimed at determining the mechanical properties of these networks, Scott's area of expertise.

Schieber uses this information to develop theories describing mechanical properties at the macroscopic level. Finally, μCoSM faculty David Gidalevitz, Venerus, and Perez-Luna verify the theoretical and computational work.

"We're spanning many areas in experiments, theory, and computation," Schieber notes, stressing that the collaborative efforts will enable accurate predictions of soft matter behavior. Researchers in Greece and Switzerland have already verified the theoretical predictions of Schieber and graduate student Renat Khaliullin about the nature of polymer-polymer interactions using atomic-level simulations. A growing body of experimental data is in agreement with the theory.

The functions of living cells and transfer through cell membranes figure among the investigations of Gidalevitz, assistant professor of physics. Condensed soft matter in the form of actin filaments and fibrils contain long-chained molecules that provide cells with their mechanical structure, something Gidalevitz is hoping to better understand.

μCoSM researchers will further explore issues including the modeling and simulation of intracellular protein and DNA dynamics, mechanical properties of the cytoskeleton, synthetic polymer property modeling, and membranes and membrane proteins. Additional applications of soft matter research are under investigation at μCoSM, including potent alternatives to conventional antibiotics and antiviral drugs, ocular drug delivery, and wound-covering materials for the treatment of burns.

—Richard Harth

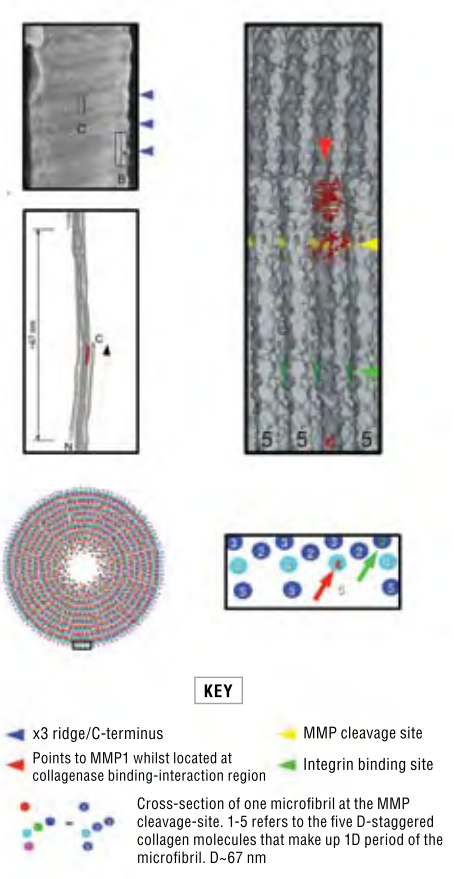

Image courtesy Joseph Orgel

Molecular architecture of the type I collagen fibril and its interaction with collagenase

MORE ONLINE

IIT Center for Molecular Study of Condensed Soft Matter: **www.grad.iit.edu/researchcenters/ucosm/index.html**
General background information about condensed soft matter: **http://physicsworld.com/cws/article/print/169**