Surge in gastrointestinal disease spurs U.S.-China collaboration

Researchers from countries with complex political relations are collaborating to fight pressing health threats

By Kathy Wren

In the 1950s, physicians in the United States and Europe began reporting a rise in cases of inflammatory bowel disease (IBD), which increased roughly threefold by the 1990s. A similar trend began in Japan in the 1970s. Now, reports of the once-rare condition are doubling rapidly in China.

For decades, researchers understood little about IBD, which includes Crohn's disease and ulcerative colitis. But the new swell in Chinese cases offers researchers "an opportunity that is unparalleled" to understand what causes the disease and how it might ultimately be treated or prevented, said John Allen, clinical chief of digestive diseases at Yale University and president of the American Gastroenterological Association (AGA).

"We have built our entire theory of both etiology and treatment around assumptions that are now in question," Allen said, such as that IBD is a disease found only in Western, industrialized nations, primarily affecting Caucasians from Europe. A new collaboration between the AGA and the Chinese Society for Gastroenterology aims to correct that course.

Allen described the agreement at the 29 April conference, "Science Diplomacy 2015: Scientific Drivers for Diplomacy," in a session about how medical challenges can lead to international science cooperation. The day-long conference was organized by the AAAS Center for Science Diplomacy and drew more than 200 people, including representatives from the U.S. State Department and other federal agencies, as well as UNESCO, The World Academy of Sciences in Trieste, Italy, and the Academy of Sciences of Cuba. Sessions at the conference covered the roles of institutions and networks in science diplomacy, cooperation during political strain, working with shared resources, and other topics.

International research collaborations such as the one described by Allen, while important in their own right, also advance the goals of diplomacy, said Rush Holt, AAAS CEO and executive publisher of the Science family of journals. "The principles of science—transparency, open communication, and evidence-based thinking—go a long way to diffusing difficult situations, breaking through barriers, and developing relationships that can yield benefits that go beyond the scientific research that might be discussed," Holt said in a plenary address.

A general picture of IBD has emerged in recent years, in which genetic predisposition, inflammatory processes, and environmental factors such as diet and hygiene affect the makeup of the gut's microbes and contribute to the condition. The memorandum of cooperation signed last September by the U.S. and Chinese gastroenterology associations lays the groundwork for an effort to sequence the gut microbiota of both rural and urban Chinese individuals. By comparing these genetic sequences, the researchers hope to uncover clues to how IBD develops and why it is more likely to arise in urban areas where lifestyles are more like those in the United States and Europe.

The time is ripe for this research because the sequencing and analysis tools are now available and because professional medical societies are on the rise in China. After the introduction of a market-based society in the 1980s, Chinese hospitals generally operated independently of each other, with very little focus on clinical research, according
to Allen. But the newly established Chinese Society for Gastroenterology has about 20,000 members and provides a much-needed organizational system for planning the research effort. Now, “when we throw the rope over there, someone is actually catching it,” said Allen.

Other countries with limited cooperation in the policy sphere are joining forces to solve another major public health problem: multidrug-resistant tuberculosis (MDR-TB). Tuberculosis kills 2 million people every year, and strains resistant to multiple drugs are now spreading rapidly, particularly in Russia, India, China, and South Africa.

In the 1990s, treating MDR-TB was considered a low priority by the World Health Organization. That changed somewhat after Paul Farmer and Jim Yong Kim, who went on to found Partners In Health, showed that MDR-TB could be treated successfully. Today, however, less than 1% of newly diagnosed cases of MDR-TB are treated each year, said panelist Gail Cassell, citing figures from a series of meetings hosted by the Institute of Medicine. Cassell is executive vice president of TB drug development at the Infectious Disease Research Institute and a senior lecturer at Harvard Medical School.

Understanding the genetic changes that lead to TB resistance is ground zero for fighting this disease, said Cassell: “Until you have the full spectrum of antimicrobial resistance, you cannot prescribe the right drug for the right patient at the right time.”

Cassell, along with Valery Danilenko, head of the department of Post-Genomic Biotechnology at the Russian Academy of Sciences’ Vavilov Institute of General Genetics in Moscow, and Dmitry Maslov, a research associate in that department, described an international effort launched in 2011 to sequence MDR-TB strains and support the development of new diagnostic tests, vaccines, and drugs.

The consortium includes researchers from many countries, including South Africa, Iran, Sweden, and others, who are using facilities in the United States, China, and Russia to sequence and analyze strains of drug-resistant Mycobacterium tuberculosis.

For a full list of the speakers and panelists, please visit the AAAS website at www.aas.org.

Screeners needed for journalism awards
Scientists from the U.S. and abroad who will be in the Washington, DC, area between late August and late September are needed to review the scientific accuracy of entries in the prestigious AAAS Kavli Science Journalism Awards competition. If you can volunteer, please contact Earl Lane (elane@aaas.org) for screening dates and categories.

Forum on S&T policy spotlights basic research, public trust

By Kathy Wren and Earl Lane

The importance of basic research for the nation’s scientific and economic future was a recurring theme as more than 400 elected officials, government and business leaders, researchers, educators, and others gathered for the 40th annual AAAS Forum on Science and Technology Policy.

Participants at the conference, held on 30 April and 1 May in Washington, DC, explored strategies for nurturing research and innovation, at the federal level and beyond, during times of continuing fiscal austerity.

Several science-funding bills were in play on Capitol Hill as the conference convened, but legislators had not proposed a replacement for the expired congressional deal that had offset some of the worst effects of the across-the-board budget cuts known as sequestration. In sessions throughout the conference, participants delved into the factors driving the tight budget environment.

Many speakers echoed a call to better support basic research, including Rep. Jim Cooper (D–TN), Flavia Schlegel, assistant director-general for natural sciences at UNESCO, and France Córdova, director of the National Science Foundation. “Our nation’s future, including our preparedness for that future, depends on innovation,” Córdova said. “Innovation in turn depends, in large part, on discovery, and discovery is fueled by basic research. This pursuit is not discretionary.”

“A lot of folks think of basic research as a sort of frivolous approach where we’re indulging the whims of scientists who just want to follow their curiosity,” said John Holdren, White House science and technology adviser, when AAAS CEO and Science Executive Publisher Rush Holt asked Holdren what he most wished the general public understood about science. Without investing in basic research and “the effort simply to understand more fully the universe, our world, ourselves, we are undermining our future,” Holdren said.

Researchers whose work is targeted as an example of wasteful government spending need to do a better job explaining the value of their work, panelists agreed in a session on defending grants against unjustified attacks. The importance of engaging with the public, through storytelling, data-sharing projects that seek public feedback, and other strategies, also took center stage in a session on public opinion and policy.

William Press, a computer scientist and computational biologist at the University of Texas at Austin (and a former AAAS president), urged scientists to separate facts and value judgments, in order to gain the trust of a public that is skeptical about science. Speaking in the William D. Carey lecture, Press outlined two quite different story lines for science—one tied to research, discovery, and innovation and what “can” be done, the other related to educating the public and advocating for what “should” be done. “Both are valuable,” he said, but scientists should take care to distinguish between them.

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