



SETTING NEW PATTERNS IN PSYCHIATRIC RESEARCH

With improved imaging technologies, leading radiologists in southwest China have **IMPROVED DIAGNOSIS** of psychiatric disorders.

Over the past three decades, rapid advances in brain imaging techniques have improved understanding of psychiatric illnesses and treatment effects. Application of these advances to clinical practice holds promise for improving diagnosis and individualized care for patients with common psychiatric illnesses, leading to the rise of a new discipline in medical sciences, psychoradiology.

“Psychoradiology uses radiological technologies to unveil patterns of brain abnormalities in patients with psychiatric disorders,” said Qiyong Gong, director of the Huaxi Magnetic Resonance Research Center (HMRR) at West China Hospital of Sichuan University. “This is particularly important, given the high incidence of such disorders.”

Of all radiological techniques, magnetic resonance imaging (MRI) is the most significant for psychoradiology. With its multimodal imaging capacities, MRI has allowed quantifying brain characteristics at structural, functional and molecular levels, enabling a comprehensive

psychoradiological system. Specifically, it maps out volume, shape, as well as structural/functional connectivity and integrity in tissues of certain brain regions. High-resolution measurements also include temperature, tissue stiffness, macro molecular changes, and metabolism. Informed by the quantitative imaging, rich data can be acquired about a diseased brain, while stringent quality control and comprehensive image analysis build a disease discrimination model, potentially leading to tailored diagnosis and treatment plan.

Breaking new ground at the intersection between radiology and psychiatry/psychology, Gong has led his team in translational imaging to improve clinical care for patients with neuropsychiatric disorders. Their pilot study on the association between clinical symptoms and cerebral gaps in psychiatric patients has led to the psychoradiological hypothesis of mental disorders. This theory suggests that brain syndromes arise from structural alteration, mainly due to the

impact of impaired functional connectivity. Following this theory, Gong’s team, and others, have identified a variety of anatomical and functional characteristics (known as ‘psychoradiological signs’) specific to psychiatric disorders.

At the Radiological Society of North America’s 2019 meeting, Gong explored the application of radiology to the diagnosis and treatment of depression, and was recognized as ‘a leader in the field of psychoradiology’ by the annual meeting’s organizer.

A Changjiang Scholar, Gong was also awarded the NIBIB New Horizons Lectureship, Finalist of the Young Investigator Award, and Senior Fellowship of the International Society for Magnetic Resonance in Medicine (ISMRM). He assumed leadership roles at various international journals and radiology associations, including the associate editor of the *American Journal of Psychiatry* and the chair of Psychiatric MR Study Group of the ISMRM. His team has published more than 300 peer-reviewed original articles in leading journals, having garnered 20,000-plus citations to date.

Gong himself has also been listed among the Clarivate Analytics’ Highly Cited Researchers in 2018 and 2019 with a current h-index of 76.

Through Gong’s efforts, HMRR has developed into a multidisciplinary centre on MR technologies, basic and clinical brain research, and education, enriched by exchanges and collaborations with leading institutions at home and abroad. Gong was invited to edit an issue on psychoradiology for *Neuroimaging Clinics of North America*, a significant series accredited by the Accreditation Council for Continuing Medical Education (ACCME) for practicing radiologists, radiology residents, and other related healthcare professionals.

With a mission to develop and apply advanced MR imaging and analytical techniques to study normal human brains and diseased ones, “we want to advance the clinical translation of psychiatric neuroimaging,” said Gong. ■


 四川大学
华西医院
 qiyonggong@hmrrc.org.cn
<http://hmrrc.org.cn>