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GUEST EDITORIAL

A bridge to somewhere

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With over 5000 journals indexed in PubMed, the announcement of a new journal generally elicits a raised brow along with some variation on these questions: Do we need another journal? Who can read even 10% of the journals covering neuropsychiatric science, either basic or clinical? Will more journals just permit more publishing of mediocre science? The answers depend on the journal or, more specifically, on the topic.

Translational Psychiatry addresses a topic that is timely and important. The parallel revolutions in basic neuroscience and genetics have not translated to a revolution in clinical psychiatry. Indeed, few clinical researchers and even fewer clinicians understand the transformative power of the changes that have taken place in the past decade in both genetics and neuroscience. The reason is simple: genetics and neuroscience have not yet proven actionable for clinical psychiatry. All of the discoveries of rare and common variants associated with mental illnesses should prove useful as portals into the pathophysiology of schizophrenia or bipolar disorder, and they may reveal 'druggable' targets. However in 2011, none of these findings are changing how clinicians diagnose or treat serious mental illness. Although neuroimaging has given us a window into brain development, connectivity and function, is there any scan that reliably influences clinical care? Even the early diagnosis of Alzheimer's disease, one broadly recognized application of positron emission tomography imaging, has yet to be shown to change the course of dementia.

Would it be irrational exuberance to claim that this 'valley of death' between basic science and clinical care is about to be bridged? I think the bridge is already well underway, and the span is not only from the traditional 'bench to bedside' but also increasingly from the clinic to the lab and back again. Indeed, if there is a culture shift that underscores the timeliness of *Translational Psychiatry*, it is the blurring of what used to be the divide between basic and clinical research. Consider a few examples, all of which are taken from current National Institute of Mental Health-funded projects:

- Discovery of a new risk gene in people with schizophrenia or autism leads to studies of this variant in neural development in a mouse or synaptic plasticity in slices, searching for cellular pathways that might explain abnormal brain function.
- Induced pluripotent stem cells from people with 16p11.2 or 22q11.2 mutations are differentiated into parvalbumin-positive interneurons along with pyramidal cells to create a 'disease in a dish' that can be used for high-throughput screening of small-molecule modifiers.
- Splice variants of candidate genes are mapped in the developing human cortex to identify where and when sequence variation alters transcription.

Are these basic or clinical studies? For most of the twenty-first century, science may not be divided into these categories. What we call 'translational' today will likely become the center of our efforts: humans will be the animal model of choice, and information from human studies will guide bench science as often as bench discoveries influence human research.

Of course, the real test of translation will be its impact on public health more than its impact on science. That bridge is still very much under construction, but it is perhaps the best argument for *Translational Psychiatry*. Public health impact, measured as a decrease in morbidity and mortality, will depend on three breakthroughs in our understanding of mental illness. First, we need biomarkers for early detection. Currently, all mental illnesses are diagnosed by abnormal behavior and cognition. We know from other brain disorders (for example, Parkinson's, Huntington's and Alzheimer's disease) that changes in behavior and cognition are a late stage of a chronic process, and we know from other areas of medicine (for example, cardiovascular disease and cancer) that early detection and early interventions are associated with better outcomes. Neuroimaging, genomics and perhaps other 'omics' will give us these biomarkers for mental disorders. Second, we need pre-emptive interventions for those detected to be at risk or those in pre-symptomatic stages of a mental illness. These interventions could include medication, but more likely will be psychosocial supports for families or devices such as video games to improve executive function. Finally, we need better treatments for people with symptoms. Current medications are not good enough. Translational science can yield new molecular targets, new small molecules and a generation of new early-phase clinical trials that focus on specific domains of function rather than diagnostic categories. Again, we have experience with this drug discovery process for other medical disorders. With the advent of novel molecular targets for mental disorders, we can expect a generation of new small molecules, some of which will become entirely new classes of treatments, perhaps as adjuncts to psychosocial treatments as part of a personalized approach to care.

These three breakthroughs will be necessary, but not sufficient, for bending the curve of morbidity and mortality from mental illness. A lesson learned from the rest of medicine is relevant to *Translational Psychiatry*. There are three spans to the translational bridge: the traditional span (T1), described in the previous paragraph, bridges bench and bedside, or perhaps more often in psychiatry, from imaging lab to imaging suite. Equally important will be the bridge from clinical lab to practice (T2). The gap between clinical science and clinical practice is legendary in medicine, where a decade or more can separate a new discovery from its broad implementation in practice. The gap in psychiatry is even greater, as most

clinicians come from disciplines outside medicine, and hence much of mental health care is provided in schools, homes and institutions outside traditional health care. Translational research that focuses on implementation and dissemination needs breakthroughs as much as T1 research. However, there is yet another span, especially important for psychiatry. The T3 span is the bridge from practice to policy. Even if a $20 000 positron emission tomography scan could reliably diagnose bipolar disorder (T1), and even if this could be shown to work in a 'real world' clinic (T2), would this scan be reimbursed by payors or required by guidelines (T3)? If translational science only makes mental health care more expensive and less accessible, we cannot expect to be successful in terms of public health impact.

All of these issues are within the domain of this new, exciting journal *Translational Psychiatry*. Yes, there are too many journals for anyone to read, and yes, this proliferation will lead to too many papers being published. However, *Translational Psychiatry* has an opportunity to make a difference by publishing the best science at a time when we can see this historic bridge being built that will link science, practice and policy. I, for one, will watch (and read) with enthusiasm.

Conflict of interest

The author declares no conflict of interest.

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