Can we get there from here? Translating stem cell research into therapies

May 25 2011

A new article published by Cell Press in the May 26 issue of the journal *Neuron* provides comprehensive insight into the current status of neural stem cell research and the sometimes labyrinthine pathways leading to stem cell-based therapies. The perspective on translating neural stem cell research into clinical therapeutics is part of a special issue of *Neuron* devoted to neural stem cells and neurogenesis and is published in collaboration with the May issue of Cell Stem Cell, which also has a selection of reviews on this topic.

Neurological disease and injury are a major cause of disability worldwide, and there is a pressing need to find reparative therapeutics for the central nervous system (CNS). Although stem cell therapies represent the frontier of regenerative medicine, the "bench to bedside" leap where scientific discoveries in the laboratory are translated to actual patient therapeutics faces many challenging hurdles.

"Stem cell research is one of the most rapidly developing areas of science and medicine," says study author Dr. Sally Temple from the Neural Stem Cell Institute in Rensselaer, New York. "The explosive rise in discoveries and technologies that we see in the basic research labs has yet to enter the pipeline, and there is an enormous gap between what we can do at the bench and what we see in the current clinical trials. It is imperative that we work towards making the process of translation more effective and affordable."

In their article, Dr. Temple and colleagues describe the current status of

stem cell-based CNS therapies, analyze currently approved clinical trials, and discuss key issues associated with translational progress. The authors report that many basic scientists are struggling with low funding levels and that funding cutbacks substantially impede new research directions. They suggest that successfully transitioning from the lab to the clinics requires a comprehensive and collaborative team effort among researchers, clinicians, regulatory agencies, patient advocacy groups, ethics bodies, and industry, and they stress that pioneering this new partnership model is essential for smooth translational path that will improve the chance that the health benefits of research reach patients.

"There is no doubt that stem cell research and application is opening great opportunities in CNS regenerative therapies and, although our survey shows that we are still at relatively early stages of defining safety for human trials, stupendous strides are being made in preclinical studies," says Dr. Temple. "However, we must engage basic researchers and their institutions to ensure that they participate in the rewards of successful translation and benefit from revenue return that will fund further creative discoveries. We envision a much more concerted effort towards translation that would make the process more accessible and efficient, forging new private/public partnerships that will spread both risks and benefits in the process. Ultimately, the rewards of solving this problem could be seen at every level, from the next generation of young scientists to the patients. We need to take steps soon, as the challenge posed by neurological disorders is growing."

Provided by Cell Press

Citation: Can we get there from here? Translating stem cell research into therapies (2011, May 25) retrieved 23 April 2024 from https://medicalxpress.com/news/2011-05-stem-cell-therapies.html

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