Stem cells may provide treatment for fetal alcohol spectrum disorder

DOI: 10.1038/tp.2012.111

Stem cell therapy which targets neural circuits once they are fully developed may help to reverse the physiological and behavioral symptoms associated with fetal alcohol spectrum disorder (FASD) in rats, suggests a paper published in Translational Psychiatry this week.

Caused by exposure to alcohol before birth, patients with FASD exhibit behavioral and cognitive problems, which have been linked to abnormalities in cortical and limbic system development. Tomohiro Shirasaka and colleagues investigated the cellular mechanism underlying the disease and potential for stem cell therapy by exposing pregnant rats to ethanol, followed by intravenous administration of neural stem cells (NSCs) into the newborn rats, at a time point when neural circuit developments were already completed. The NSCs were combined with a compound called atelocollagen, used to avoid immune rejection and facilitate migration into the brain. The authors found that the NSC treatment restored both a class of neurons and neuronal protein found to be reduced in the ethanol-exposed rats, and reversed impaired memory/cognitive function and social interaction behavior.
These findings suggest that synaptic remodeling and neurogenesis play an important role in the pathophysiology and treatment of FASD, and describes therapeutic potential for intravenous NSC administration using atelocollagen.

Author contact:
Tomohiro Shirasaka (Sapporo Medical University, Sapporo, Japan)
Tel: +81 11 611 2111 x3518; E-mail: shirasaka.t@sapmed.ac.jp

Editorial contact at Translational Psychiatry:
Julio Licinio (Australian National University, Canberra, Australia)
Tel: +61 2 6125 2550; E-mail: julio.licinio@anu.edu.au

Media contacts:
Rachel Twinn (Nature, London)
Tel: +44 20 7843 4658; E-mail: r.twinn@nature.com

Neda Afsarmanesh (Nature, New York)
Tel: +1 212 726 9231; E-mail: n.afsarmanesh@us.nature.com

About Nature Publishing Group (NPG):
Nature Publishing Group (NPG) is a publisher of high impact scientific and medical information in print and online. NPG publishes journals, online databases and services across the life, physical, chemical and applied sciences and clinical medicine.

Focusing on the needs of scientists, Nature (founded in 1869) is the leading weekly, international scientific journal. In addition, for this audience, NPG publishes a range of Nature research journals and Nature Reviews journals, plus a range of prestigious academic journals including society-owned publications. Online, nature.com provides over 5 million visitors per month with access to NPG publications and online databases and services, including Nature News and NatureJobs plus access to Nature Network and Nature Education’s Scitable.com.

Scientific American is at the heart of NPG’s newly-formed consumer media division, meeting the needs of the general public. Founded in 1845, Scientific American is the oldest continuously published magazine in the US and the leading authoritative publication for science in the general media. Together with scientificamerican.com and 15 local language editions around the world it reaches over 3 million consumers and scientists. Other titles include Scientific American Mind and Spektrum der Wissenschaft in Germany.

Throughout all its businesses NPG is dedicated to serving the scientific and medical communities and the wider scientifically interested general public. Part of Macmillan Publishers Limited, NPG is a global company with principal offices in London, New York and Tokyo, and offices in cities worldwide including Boston, Buenos Aires, Delhi, Hong Kong, Madrid, Barcelona, Munich, Heidelberg, Basingstoke, Melbourne, Paris, San Francisco, Seoul and Washington DC. For more information, please go to www.nature.com.