The brain’s response to financial loss

A region of the brain involved in the sensory and reward system is important to how people respond to financial loss. Research published online this week in Molecular Psychiatry, suggests that the transport of a reward system neurotransmitter, called norepinephrine, could be crucial in the development of pharmacological therapies for neuropsychiatric disorders like pathological gambling and ADHD.

Loss aversion describes having greater sensitivity to losses compared to gains, and it can vary widely between individuals. Most people would only enter a two outcome gamble if it were possible to win more than they could lose; people with impaired decision making show reduced sensitivity to monetary loss. Previous evidence indicates that this could be due to low levels of norepinephrine.
Hidehiko Takahashi and colleagues investigated the relationship between norepinephrine transporters on neurons in the thalamus and loss aversion by performing positron emission tomography (PET) scans on 19 healthy male individuals. Individuals participated in a gambling task and then subsequently had PET scans. The PET scans showed substantial individual differences in terms of density of norepinephrine transporters in the thalamus. The authors found that individuals with low levels of norepinephrine transporters—that is, having less norepinephrine re-uptake—show enhanced emotional effects in relation to norepinephrine. These findings mean that these individuals show pronounced emotional or arousal response to losses relative to gains.

Author contact
Hidehiko Takahashi (Kyoto University Graduate School of Medicine, Japan)
Tel: +81 75 751 8507; E-mail: hidehiko@kuhp.kyoto-u.ac.jp

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

Press contacts:
For media inquiries relating to embargo policy for the journal, Molecular Psychiatry:

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

Ruth Francis (Nature London)
Tel: +44 20 7843 4562; E-mail: r.francis@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.