

IN BRIEF

DOI:

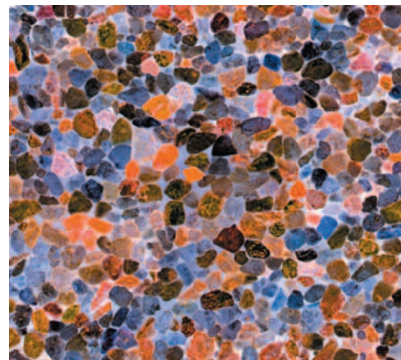
10.1038/nrd2322

STEM CELLS

Stem cells act through multiple mechanisms to benefit mice with neurodegenerative metabolic disease.

Lee, J. P. *et al. Nature Med.* **13**, 439–447 (2007)

Neuronal stem cells possess a range of actions that are potentially therapeutic. Using a mouse model of the lethal neurodegenerative disorder Sandhoff disease, Lee and colleagues showed that intracranial transplantation of neuronal stem cells (including human embryonic stem cells) delayed disease onset, preserved motor function, reduced pathology and prolonged survival. Moreover, efficacy was found to be due to factors additional to neuronal replacement. The finding that neuronal stem cells exhibit a repertoire of therapeutic actions might help formulate multimodal strategies for the treatment of neurodegenerative diseases.

**ANTIBACTERIAL DRUGS**

Structural insight into the transglycosylation step of bacterial cell-wall biosynthesis.

Lovering, A. L. *et al. Science* **315**, 1402–1405 (2007)

Peptidoglycan glycosyltransferases, which are involved in bacterial cell-wall synthesis, represent excellent antibiotic drug targets, but so far no inhibitor with appropriate properties for use in humans has been identified. Lovering and colleagues determined the 2.8Å structure of a bifunctional cell-wall crosslinking enzyme, including its transpeptidase and glycosyltransferase domains, both unliganded and complexed with the substrate analogue moenomycin. These structures could aid in the design of new antibacterial drugs that overcome resistance.

NANOTECHNOLOGY

Shape effects of filaments versus spherical particles in flow and drug delivery.

Geng, Y. *et al. Nature Nanotech.* **2**, 249–255 (2007)

There have been few studies investigating the effects of nanoparticle shape on their *in vivo* properties. Geng and colleague used filomicelles — polymer micelle assemblies — to demonstrate that filamentous nanoparticles persisted in rodent circulation for much longer than spherical nanoparticles or other known synthetic nanoparticles. Furthermore, preliminary results suggested that filomicelles could deliver the anticancer drug paclitaxel and shrink human-derived tumours in mice more effectively than free drug, highlighting the potential of filamentous carrier systems for cancer therapy.

COMPUTATIONAL CHEMISTRY

Recore: a fast and versatile method for scaffold hopping based on small molecule crystal structure conformations.

Maass, P. *et al. J. Chem. Inf. Model.* **47**, 390–399 (2007)

Replacing central elements of known active chemical structures is a common procedure to discover new compound classes. Maass and colleagues describe a new computational approach for scaffold replacement that combines three properties in one tool — avoiding structures with strained conformations, enabling the exploration of large chemical space and allowing interactive use through short response times — and demonstrate its ability to identify new valid scaffold topologies.