



nature publishing group



► **COVER:** 'Thinking is a drawing in your head' by Simon Fenwick, inspired by an image in *The Art of Looking Sideways* by Alan Fletcher.



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It is said that a picture is worth a thousand words. But where the intricate and complex nervous system is concerned, obtaining finely detailed pictures of cellular structure and activity is not a trivial pursuit. However, neuroimaging techniques have undergone a 'rainbow' revolution during the past few decades. This has provided significant impetus for studies in all areas of neuroscience, including basic neurobiology, cognitive neuroscience, translational neurology, and clinical practice. They are an indispensable part of an emerging trend of so-called 'integrative neuroscience', in which genetics, cellular and molecular biology, electrophysiology, computer modelling, bioinformatics and behavioural studies converge to address sophisticated, high-level neuroscience questions.

In this issue, Misgeld and Kerschensteiner (page 449) outline the *in vivo* optical imaging techniques used to visualize the nervous system, and how these approaches have shed fresh light on the aetiology of and therapeutics for neurological diseases. They discuss the challenges of integrating real-time observations with the molecular mechanisms and clinical manifestations of neurological diseases, and argue that the convergence of new optical and non-optical methods will be crucial for further advancement. This review marks the beginning of a series of articles on neuroimaging techniques, which will be published over the coming months.

The development of neuroimaging techniques is also the topic of a Research Highlight this month. 'Nanoscale neuroimaging' (page 416) describes the application of an innovative method to view cellular structures such as synaptic vesicles. This technique, known as stimulated emission depletion microscopy, overcomes the limitations of conventional microscopy methods, and can obtain images that are sharpened to a nanoscale resolution.

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