



## The art of neuroscience

Image 'Layers of the mind' by Rhiannon Meredith. Does your work lend itself to a striking visual image? Get in touch on [jon.sutton@dbps.org.uk](mailto:jon.sutton@dbps.org.uk).

At the Meredith Lab ([www.rhisearch.com](http://www.rhisearch.com)) part of the Center for Neurogenetics and Cognitive Research in the Netherlands, Rhiannon Meredith

and colleagues are studying how synaptic transmission and plasticity changes during key periods of brain development. One recent study (see

[tinyurl.com/cmub99h](http://tinyurl.com/cmub99h)) was driven by the theory that in the brains of people with autism there are more interconnected short-range networks and weaker or fewer connections between networks spread across the brain. 'We decided to test this directly at the synaptic connections between neurons in "living" brain tissue,' Meredith tells us. 'I have a colony of mice with the same genetic impairment as people with fragile X syndrome, a disorder characterised in humans by intellectual disability, cognitive

impairments and also autistic spectrum disorder in around one third of diagnoses.' Example clusters of recorded neurons are shown in the composite image, filled with a chemical marker and stained. 'Our findings confirmed the theory proposed by human data that there is hyperconnectivity at short-range connections in medial prefrontal cortex in this genetic mouse model for fragile X syndrome. Further research suggested this was limited to early developmental stages, but we predict that such

neuropathological abnormalities could re-occur again in the adult.' The image received an 'Honorable mention' in the 2012 Art of Neuroscience competition, organised by the Netherlands Institute for Neuroscience. 'It's an opportunity to highlight the work we're doing to an audience that may not be aware of what links can be made between human disorders and genetic mouse models,' says Meredith. 'In this case, it highlights what we see as the beauty of the intricate structures from which we record neuronal activity patterns.'