Treatment of Neurodevelopmental Disorders in Adulthood.
The Journal of Neuroscience 2012.

This is an excellent review of a concept that appears to be growing in popularity. Neuronal plasticity is defined as “the capacity of neurons and neural circuits in the brain to change structurally and functionally in response to experience”. During our development, it was thought that there was a “critical period of plasticity” after which, the brain became less responsive (eg. it is easier to learn a foreign language as a child than as an adult). However, studies looking at the visual cortex in mouse models have shown that the state of plasticity observed in the “critical period” can be reactivated in adulthood through drug treatment and specific environmental manipulation - also called environmental enrichment (EE). Combine this with appropriate rehabilitation and it is then possible to demonstrate recovery of function to a certain extent.

The authors review some of the evidence that suggests that the phenotypes associated with neurodevelopmental disorders might be improved, even in adulthood, with these approaches. They also focus on 2 particular conditions, Fragile X Syndrome and Neurofibromatosis type 1, both of which are genetically inherited conditions. They review experimental data on adult mouse models that have demonstrated the reversal of some of the features of the underlying condition. They conclude by saying that this line of research may eventually lead to the development of treatments that might alleviate or cure symptoms and disabilities that occur secondary to neurodevelopmental disorders.

Note - Although CDKL5 is NOT specifically mentioned in this review, it is still pretty exciting stuff! Clearly there is a long way to go with this line of research, and as always, the big question will be can results from animal studies be translated to humans? If it does become possible to induce a state of plasticity such that a ”learning programme” can be instituted to improve cognitive function, then, this would go a long way to helping many adults and children with conditions like CDKL5.