The talk will describe the clinical characteristics of fragile X syndrome, basic research and animal model work leading to understanding of the roles of FMRP in regulation of dendritic translation and synaptic morphology and plasticity, and aberrant regulation ensuing from absence of FMRP in FXS and FXS models. The development of treatments correcting the cellular translational pathway, synaptic functioning and numerous phenotypes in the animal models will be presented, followed by a discussion of the effort to bring these findings to humans with FXS, including hurdles, lessons learned, and resultant need to develop new paradigms for translation of treatments targeted to mechanisms of neural plasticity in neurodevelopmental disorders.