About 1% of people suffer from Autism Spectrum Disorder (ASD). Recently, functional deterioration of connections between the cortex and thalamus that is a subcortical center of sensory processing has been reported in ASD patients. The goal of our project is to develop an animal model of thalamocortical dysfunctions, and use this model to understand how these dysfunctions are involved in the pathogenesis of ASD. A strain of genetically modified mice has been created in our laboratory, in which the activity of genes that shape thalamic excitability patterns is decreased. In these mutant mice, we will examine sensory sensitivity, social performance and other ASD-like behavioural responses, to validate these mice as a model of ASD. Next, we will analyse electrical activity of neurons in thalamocortical loops, in order to correlate the identified perceptual or behavioural deficits with specific brain impairments. Then, we will perform o series of experiments with compounds that modify neuronal activities to understand cellular underpinnings of thalamus-dependent ASD pathomechanisms. With this research, we will explain how the thalamus contributes to ASD-associated sensory hypo- or hypersensitivity, social communication and behavioral flexibility, and open a new avenue towards the understanding and treatment of this disorder.