

2016 – 2017 William F. Friedman Endowed Fellow



Elena Minakova, MD, MS
Fellow, Neonatology

Project Title: *Melanotan-II reverses autistic features in environmental and genetic mouse models of autism*

Elena Minakova, MD, MS, is a third-year fellow in the division of Neonatology. Dr. Minakova was drawn to the field of developmental neurobiology due to the plasticity of the nervous system and its ability to significantly impact outcomes during critical time points of development. She's spent over three years conducting basic science research in this field, where she explored mechanisms by which neurotransmitters, GABA and glutamate, can affect electrical activity with resultant neurotransmitter re-specification. Understanding these critical time points in brain development along with the pertinent neuro-modulatory signals involved will help advance the ability to treat and understand disorders such as schizophrenia, depression, and autism spectrum disorders (ASD).

ASD is a neurodevelopmental disorder characterized by impaired social interactions, difficulty with communication, and repetitive behavior patterns. Currently, treatment for autism is largely limited to behavioral therapy modifications. Due to the complex interplay between environmental and genetics factors implicated in autism, pharmacological agents targeting the underlying cause of the condition are not available. Of interest, a brain chemical known as oxytocin has been shown to increase social interactions and bonding. Previous attempts at administering oxytocin in both humans with autism and mouse models of autism have yielded inconsistent results due to difficulty of oxytocin crossing from the bloodstream to the brain.

Recently, a novel pharmacological agent called Melanotan-II (MT-II) has been shown to cross easily from the bloodstream to the brain and stimulates brain oxytocin release. Following MT-II administration in mouse models, a significant improvement was shown in social deficits and the staining of the hypothalamic region of the brain revealed an increased number of oxytocin neurons. Dr. Minakova's current research project investigates MT-II as a potential therapeutic target for autism in environmental and genetic autistic mouse models and its effect on neurotransmitter/neuropeptide changes in the limbic system and hypothalamus.

Dr. Minakova hopes to become a principal investigator spending the majority of her academic time performing basic science research in the field of autism while also practicing clinical neonatology.