The information encoded as genes in the DNA sequence of every living cell is translated to the protein language in a multistep manner. In the first step of gene expression called transcription, information stored in the nucleus is copied as an RNA molecule (another type of nucleic acid) so it can be sent out to the cell's cytoplasm, where it is translated to protein. Transcription involves many regulatory factors to ensure the proper time, amount, and type of proteins that will be later manufactured. Some proteins like those involved in the cell's metabolism are produced all the time, others are made in response to specific signals from the environment. The best example of such a response is the activation of neurons, which happens every time neuronal cells communicate. After receiving the signal neuron activates the transcription of hundreds of genes, which protein products allow to create or modify the connections with surrounding neuronal cells. This process is called neuronal plasticity and it underlies the formation of memory and learning. In the proposed project we would like to research a protein called NONO, which is involved in the regulation of transcription in many types of cells. NONO mutations in humans result in improper brain development and intellectual disability. Genetically modified mice deprived of NONO protein show similar neurological and behavioral deficits. However, it is not clear if the cognitive problems in human patients and mice are caused by abnormal brain development or faulty neuronal plasticity, as NONO is involved in the regulation of transcription necessary for both these processes. Therefore our goal is to explore the NONO protein function in mature neurons and adult animals. We will look at the consequences of NONO deprivation on the function of neuronal cells and the potential of forming and modification of neuronal connections in response to activation. To look at the whole organism level we decided to use a model organism a nematode *Caenorhabditis elegans*. The nervous system of *C. elegans* comprises 302 neurons and has the best-described anatomical network of neuronal connections. It has a transparent body and can be easily genetically modified. We will look at how deprivation of NONO induced in the adult nervous system of the worm influences its behavior. By this we hope to learn how NONO protein regulates activation-dependent transcription, which is necessary for the neuronal plasticity underlying memory formation and learning.