**Brain dopamine functions and pharmacology: studies with the dopamine transporter mutant mice**

Monoaminergic neurotransmitter dopamine plays a critical role in the regulation of movement, emotions and reward, and its dysfunction contributes to several brain disorders. A complex homeostatic balance between the amount of DA synthesized, packaged in the vesicles, released, re-uptaken via plasma membrane transporter and metabolized, determines overall status of dopaminergic signaling. The plasma membrane dopamine transporter (DAT) provides effective control of both the extracellular and intracellular concentrations of DA by re-capturing released neurotransmitter into the presynaptic terminals. This transporter is a primary target of psychostimulants and neurotoxins, such as cocaine, amphetamines and MPTP. Dr. Gainetdinov will summarize recent advances in understanding the functional roles of these transporters and the mechanisms of action of psychotropic drugs as revealed in studies using mice with genetic deletion of the DAT.