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Translational Neuroscience Accomplishments

SOCIETY FOR NEUROSCIENCE

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Depression and Bipolar Disorder Animal research has revealed the biochemical systems involved in mood and led to better treatments for depression that more directly target the key neurotransmitters that regulate mood.

Drug Addiction Rodent research has led to the understanding that addiction is a brain disease, how chemical signaling is altered in addiction, and to the testing of new drug treatments for drug abuse.

If you have any questions concerning the list, contact tna@sfn.org.

Multiple Sclerosis Rodent models have created a unique opportunity to observe the way the nerve covering myelin is created, damaged, and repaired in MS, findings that have been essential in improving treatment.

Stroke The use of animal models has guided the successful development of treatments including a drug which relieves clots blocking blood flow to the brain, cooling the brain, and drugs to reduce damage once a stroke has occurred.

Stress Basic animal research has revealed the chemical and anatomical systems involved in anxiety and post-traumatic stress disorder, providing targets for medications to help restore normal function.

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The Brain's Chemical Code The development and use of new neuroanatomical techniques in rodents and nonhuman primates advanced the understanding of how neurons communicate with each other. This led to a molecular understanding of the synapse, the communication point between neurons, and several brain disorders.

Polio Experiments in monkeys led to the understanding that polio was caused by a virus and set the stage for subsequent development and testing of a polio vaccine in nonhuman primates that was then translated for use in humans.

Prions Experiments using rodents found that prion diseases, such as scrapie, kuru, Creutzfeldt-Jakob disease, and "mad cow" disease, are all infectious, yet they are transmitted through a novel mechanism. This has laid the groundwork for the diagnosis and, eventually, the treatment of prion-related disorders.

Neural Circuitry of Memory Experimental analyses of both rodent and nonhuman primate models have revealed the neural circuitry and several molecular mechanisms of memory that have implications for Alzheimer's disease and aging.

Blindness and the Retina The unraveling of the genetic basis for a particular form of retinitis pigmentosa that leads to blindness in both dogs and humans has led to the successful use of gene therapy to restore vision in dogs with this genetic defect, laying the groundwork for such an approach in humans.

Parkinson's Disease Studies of animals led to understanding the mechanisms that underlie neurodegeneration and the detailed circuitry affected in PD. This has led to two promising treatments involving surgery and deep brain stimulation, and provided molecular targets for countering the degeneration of dopamine neurons that are involved in PD.

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