Multiple Sclerosis (MS)

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.

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.

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.

Neural Circuitry of Memory

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

Neuroprosthetics

Experiments in monkeys and rodents led to the development of neuroprosthetic devices that can help patients to restore some of their lost sensory and motor functions.

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.

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Animal Research Accomplishments

Advancing Science, Improving Health

FENS Federation of European Neuroscience Societies

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Basic neuroscience research on animal models is essential to aid the understanding of brain disorders that afflict humans— and the development of successful therapies. Here are some examples.

Depression & Bipolar Disorder

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

Polio

Experiments in monkeys revealed that polio was caused by a virus and set the stage for subsequent development and testing of a polio vaccine in monkeys that was then translated for use in humans.

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. It also laid the groundwork for such an approach in humans.

Parkinson's Disease (PD)

Research using Rhesus monkeys led to our understanding of the detailed brain circuitry affected in PD and the development of techniques for electrically stimulating the living brain. This led directly to treatment of PD by deep brain stimulation, a therapeutic approach that bettered the lives of tens of thousands of PD sufferers worldwide. Animal research also provided molecular targets for countering the degeneration of dopamine neurons that are involved in PD.

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.

The Brain's Chemical Code

Neuroanatomical and physiological techniques in rodents and monkeys revealed fundamental principles of brain functions: how neurons communicate with each other and how neuronal circuits process sensory inputs and generate motor behaviours. This aids the understanding of several brain disorders.

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