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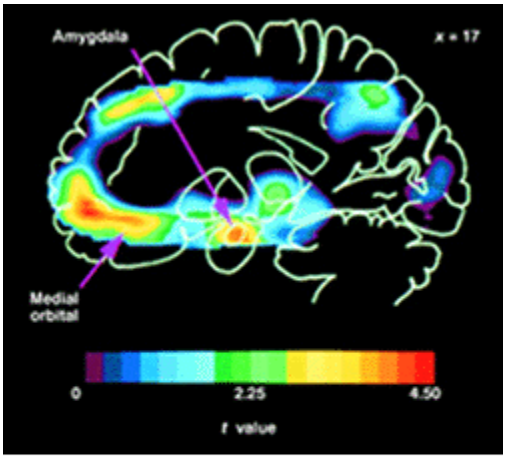
# The Nervous System




One of the major areas in which molecular genetics will play an important role in the future is in complex disorders like schizophrenia and depression. The figure shows areas of increased bloodflow (red hotspots) in the left amygdala and the medial orbital cortex of a person with familial, major depressive order. The molecular basis for this observation, and others like it, remain a challenge for the future. [Reproduced from Andreasen, NC (1997) Science 275, 1586-1593, with permission.]

The brain and nervous system form an intricate network of electrical signals that are responsible for coordinating muscles, the senses, speech, memories, thought and emotion.

Several diseases that directly affect the nervous system have a genetic component: some are due to a mutation in a single gene, others are proving to have a more complex mode of inheritance. As our understanding of the pathogenesis of neurodegenerative disorders deepens, common themes begin to emerge: Alzheimer brain plaques and the inclusion bodies found in Parkinson disease contain at least one common component, while Huntington disease, fragile X syndrome and spinocerebellar atrophy are all 'dynamic mutation' diseases in which there is an expansion of a DNA repeat sequence. Apoptosis is emerging as one of the molecular mechanisms invoked in several neurodegenerative diseases, as are other, specific, intracellular signaling events. The biosynthesis of myelin and the regulation of cholesterol traffic also figure in Charcot-Marie-Tooth and Neimann-Pick disease, respectively.

## Diseases

Alzheimer disease

Amyotrophic lateral sclerosis

Angelman syndrome

Ataxia telangiectasia

Charcot-Marie-Tooth syndrome

Cockayne syndrome

Deafness

Duchenne muscular dystrophy

Epilepsy

Essential tremor

Fragile X syndrome

Friedreich's ataxia

Gaucher disease

Huntington disease

Lesch-Nyhan syndrome

Maple syrup urine disease

Menkes syndrome

Myotonic dystrophy

Narcolepsy

Neurofibromatosis

Niemann-Pick disease

Parkinson disease

Phenylketonuria

Prader-Willi syndrome

Refsum disease

Rett syndrome

Spinal muscular atrophy

Spinocerebellar ataxia

Tangier disease

Tay-Sachs disease

Tuberous sclerosis

Von Hippel-Lindau syndrome

Williams syndrome

Wilson's disease

Zellweger syndrome