

RESTOR 00092

Guest Editorial

Restitution of function; a research goal for the decade of the brain

The past decade of neuroscience research, basic and clinical, is characterized by impressive advances in understanding the structure and function of the nervous system, the prevention of neurological disorders and improved methods of diagnosis and treatment. The language and methodologies of modern neurobiology including molecular genetics, cellular biology, neuropharmacology, brain imaging and clinical trials are now all part of our everyday conversation; the remarkable increase in the number of first-class journals in the neurosciences is a measure of continuing and accelerated growth of knowledge.

However, in our preparation for scientific and/or medical careers, our teachers often told us that the human nervous system was incapable of meaningful biological repair. Phylogenetic dogma dictated that specialized neuronal function had been achieved at the price of the ability of neuronal tissue to heal itself or be healed. It was believed that all that was available was surgical excision of pathological tissue, pharmacologic interference with pathophysiologic processes, psychological counseling for behavioral dysfunction, and a biological process called 'plasticity' – usually meaning a reorganization by which other areas of brain assumed some of the function of the damaged zone. Acceptance of the concept that the damaged neuron could repair itself is very recent; axons and dendrites can regenerate; denervated tissue can be reinnervated; the pharmacologic replacement of a lost neurotransmitter is achievable; the surgical reconstruction of a damaged zone is feasible. To put it another way, it is now acceptable to consider that restitution of lost nervous system function is a realizable biological and medical objective.

Following a Congressional resolution in 1989, in July 1990 President Bush issued a Presidential Proclamation designating the period 1990–1999 to be the Decade of the Brain. He called upon the nation to address the issues of understanding the human brain and to apply that knowledge both to decreasing mortality and to improving the quality of life of our citizens. The

National Institute of Neurological Disorders and Stroke (NINDS), the focal point at the National Institutes of Health for neurological research, has accepted this Presidential charge. Stable research programs for increasing our knowledge about neurological disease prevention have been put in place; aggressive research programs have been initiated for the development of improved methods of diagnosis and intervention early in neurological disorders in order to arrest the progression of disease. The next challenge is the development of a national endeavor for research on restitution of function – improving biological knowledge of the basis for the selective vulnerability of neural tissues and of their specific reaction to injury – evaluating the efficiency of present methods of clinical intervention, and developing and evaluating new methods of intervention to restore function.

Each of these research agendas must overcome the prevailing scientific and health care biases, attract the attention of basic and clinical scientists, obtain necessary funds for exploratory and pilot studies, and receive sympathetic attention from national funding agencies. These are the same problems that other areas of nervous system research have faced in the past – faced and successfully solved. In this NINDS Decade of the Brain, research on restitution of function is in a particularly favorable position to receive the emphasis needed. However, the NINDS can only *help* the community address the research agenda; it cannot assume responsibility for the conduct of that agenda. By giving priority to research addressing improvement in the quality of life, the NINDS has set the administrative stage at the federal level for support of research on restitution of function. The scientific communities are now challenged to get on with the job.

Will we hear from you?

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