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Book Review

Mattson MP, editor: *Pathogenesis of Neurodegenerative Disorders*, 304 pp, Totowa, NJ, Humana Press, 2001 (\$135.00).

This book is a timely collection of 12 papers authored by 26 experts from the USA, UK, Australia, and Switzerland. The first two chapters cover the basic molecular and biochemical mechanisms that seem to play a pivotal role in the various forms of neuronal degeneration. During "The Decade of Brain" (1990-2000), enormous amounts of new information have been accumulated about the various mechanisms that induce neuronal damage and death. As it is clearly summarized in the first two chapters, the basic processes that are relevant in this regard are apoptosis, neuronal excitotoxicity, and oxidative stress (i.e., free-radical-mediated damage). An understanding of these cellular or subcellular processes is essential because, although to variable degrees, they all play a role in the specific forms of disorders that in the not too distant past had been described almost purely on phenomenological level. It is now obvious that the above-mentioned mechanisms combined with specific molecular genetic and environmental factors are responsible for the development of the diseases that are covered in a concise, remarkably up-to-date manner in subsequent chapters. These include Parkinson's disease (PD), Huntington's disease (HD), Alzheimer's disease (AD), Down syndrome, ALS, ischemic stroke, spinal cord injury, and Duchenne Muscular Dystrophy. The chapter on "Trinucleotide Repeat Disorders" provides fascinating reading, and, although it focuses on one of these disorders (dentatorubral-pallidoluysian atrophy [DRPLA]), it is rather didactic because it is known that at least eight forms of hereditary neurodegenerative disorders are caused by expansion of CAG trinucleotide repeats.

The 12 chapters are balanced in length, are all well referenced, and provide a state of the art summary for those who are only tangentially involved in studying these disorders or treating patients suffering from any of them. On the other hand, for those whose main interest lies in research related to any of these diseases, it is a refreshing, well-written, and well-edited overview of a field that evolves and changes at unprecedented speed. Even when one is in the epicenter of scientific endeavors to unravel the heretofore unknown details of a specific disease, it is often very helpful to step back and take time to look at the "Big Picture." And this is exactly what the editor has achieved. With the help of well-known experts

in the relevant fields, several basic pieces of the puzzle are provided that with the appropriate intellectual efforts can be sewn together. The result is the emergence of an overall view, the "Big Picture." The chapters on stroke and spinal cord injuries best exemplify this. At first glance it is not evident why circulatory disorders or trauma would fit the requirements for being included in the group of neurodegenerative diseases; even more so because many of the latter often are still viewed as system or multisystem abnormalities. It is time to realize that a disease with single, apparently distinct clinical phenotype can have several underlying causes. The other side of the coin is that the same neurodegenerative process may present as several clinical phenotypes. But the basic, fundamental changes are the ones outlined in Chapters 1 and 2. This realization redefines the concept of selective vulnerability. This series of papers definitely helps to make the necessary mental "switch" from older, phenomenological classifications to the emerging idea of common molecular pathomechanisms affecting selective parts of the CNS. The selectivity now is understood more as a combined effect of cellular biochemistry, molecular genetics, and the interaction of these variables with aging and environmental factors, many of the latter still being only partially clarified.

It is probably an inherent consequence of compiling individual articles and thus creating a book that the number of illustrations is rather low. Anyone engaged in writing papers for scientific journals is well aware of the restrictions that usually apply to the number of figures. This may explain why the individual chapters have only a few illustrations (including flow charts that would have been very helpful in many instances). However, the relative lack of illustrations is still one of the weaknesses of the book. Another that may be the result of the same cause is that the individual chapters are not structured the same way. Although each of them has an "Introduction" and "Conclusion," between these two basic structural elements the chapters are quite variably assembled. Regardless, the overall value of the book is undeniable, and it is beyond doubt that it will serve as a major reference source for neurologists, neuropathologists, and residents training in the respective fields.

Peter P. Molnar
University of Debrecen
Debrecen, Hungary