

BOOK REVIEW

Foundational Concepts in Neuroscience: A Brain-Mind Odyssey

By David E. Presti

2016 Academic Press, 298 pages

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David Presti's new neuroscience book is a concise volume, a little over 250 pages of text. The organization of the book is fairly typical for a neuroscience text, the first chapter is historical although there is a good deal of history incorporated into other chapters as well. Chapter 2 introduces the nervous system and gives an overview of the major brain structures: medulla, pons, cerebellum and the four cerebral lobes without mentioning any functions associated with them. The major parts of the neuron appear in a drawing in the same chapter, but the only thing shown in the cell body interior is the nucleus; organelles and their functions are not mentioned anywhere in the text, although ribosomes are briefly mentioned in a later chapter.

Presti is obviously a big fan of chemistry, but too much of the text is occupied with molecular structures for the intended audience of introductory neuroscience students or general readers. Structural drawings appear so often throughout the text that I wondered whether some chapter topics were chosen in order to show the structures rather than using the structures to illustrate a particular concept. For example, Chapters 8, Poison, Medicine and Pharmacology and Chapter 9 Psychoactive Drugs have redundant content and could have been combined if the extensive treatment of toxins, TTX, STX, BTX had been omitted. Similarly, the chapter on smell could have been combined with the taste chapter instead of spending so many pages on chemical structures of different spices and aromatic substances, especially since the structures cannot be tied to specific receptors.

Chapter 11 introduces the sensory systems by primarily discussing systems not available to humans, for example detection of polarized light, electrical and magnetic fields. It is interesting, but I wonder whether it belongs in the text since there is no discussion of the mechanisms for transducing these different types of signals.

The Memory chapter (19) covers the major topics: working memory, long term memory, declarative and non-declarative memory. The topic of cellular and molecular mechanisms of memory in *Aplysia* is introduced but the mechanism described is the one underlying sensitization, not associative learning. The Hebb rule is also introduced but there is no mention of NMDA receptors, and neither LTP nor activity-dependent pre-synaptic facilitation are presented as learning or memory mechanisms, which are serious omissions.

The chapters describing neuronal transmission are clear and concise as are the chapters on vision, hearing and touch. TRP channels are mentioned in connection with taste, and in the discussion of temperature and pain receptors in the skin. As befits someone with doctorates in both molecular biology and clinical psychology, Presti issues appropriate cautions about overly simplified notions of the relationship between brain chemistry and psychological disorders.

No experimental findings are described in connection with any of the topics except in the most general way. To use this book as a text would require supplementary material including better figures. Although it is readable, it has odd features. Presti draws many examples from the film *2001 A Space Odyssey*, which most students and many faculty have never heard of, much less seen. He also ends most chapters with a haiku. There are only black and white drawings and photographs, among them beautiful reproductions of illustrations by Vesalius, Cajal, Golgi and Descartes. The contemporary drawings of brain structures are less successful because interior structures are not depicted with any detail, and muddy shading obscures others.

In the preface to this volume, Presti identifies his intended audience as students in introductory neuroscience classes or general readers. The unusual nature of the book would make its use in an introductory course problematic without substantial supplementary material, and I think general readers would find some aspects tough to comprehend.

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