rewarding problems in astrophysics. Again, the more we learn about the sun, the better we will be able to interpret similar observed features on other stars. This theme is expanded in part 5, which combines discussions of solar-like phenomena observed on other stars with observations of the sun as just another star.

The 123-page bibliography lists some 4000 references (this is my guess) with full titles. The sources are almost all to be found in the refereed and commonly available literature, and they include works published up to about 1990. The book also includes a group of appendixes containing basic data on the sun's element abundances, models of its interior, and its so-called p-mode frequencies, but lacks a detailed subject index. In my opinion, this is defensible given the targeted audience and the uselessness of 100 references such as "Sunspots, magnetic fields."

Solar Interior and Atmosphere should be available to anyone involved in astrophysical or space research and teaching, and it also would be a useful addition to any solar physicist's personal library.

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A Peptide

Galanin. A New Multifunctional Peptide in the Neuro-endocrine System. TOMAS HÖKFELT, TAMAS BARTFAI, DAVID JACOBOWITZ, and DAVID OTTOSON, Eds. Macmillan, London, 1992. xviii, 433 pp., illus. £75. Wenner-Gren International Symposium Series, vol. 58. From a symposium, Stockholm, June 1990.

The biologically active peptide galanin was isolated in 1983 from porcine intestine by Tatemoto, Mutt, and collaborators, who used a biochemical protocol to identify new compounds with COOH-terminal amino acid α-amides. This type of sequence was common to many known biologically active peptides, and Tatemoto *et al.* reasoned that others could be isolated on this basis as well. The current myriad of peptides in search of function is overwhelming, but galanin stands out in that it has been clearly implicated in a number of neuromodulatory and endocrine functions. Galanin is colocalized in many cholinergic neurons of the brain, including those involved in memory acquisition and those particularly susceptible to Alzheimer's disease. Cellular and biochemical studies have shown that one of galanin's common functions is to presynaptically inhibit acetylcholine release. In the endocrine pancreas of many species, galanin acts directly on the pancreatic β cells to inhibit glucose-stimulated release of insulin. Galanin is also involved in the regulation of growth hormone release.

The potential importance of this peptide is underscored by the large international group of researchers actively investigating its actions, many of whom contributed to the symposium from which this volume is derived. The contributions are loosely organized into sections on topics ranging from the discovery, biochemistry, and molecular biology of galanin to its role in behavior and disease. The organization is somewhat arbitrary since many presentations span more than one subject; there is also considerable repetition since several groups are investigating similar aspects of galanin's function. Unfortunately, the index is poor, which means that there is no easy way to access all of the information on a particular area. These caveats aside, the volume provides an excellent overview of our current understanding of this peptide.

Chapters by Rökaeus and Waschek and Kaplan *et al.* in the first section provide especially nice reviews of the molecular biology of galanin, and excellent discussions and maps of the distribution of galanin and its binding sites are provided in the second section. The remainder of the contributions deal with functional studies on topics from receptors to behavior, with evidence at each level that the NH_2-terminal portion of the molecule is important for function. Residues 1 through 15 or 19 (of 29) generally work as well as the whole molecule. A tryptophan in the second position is crucial in many instances.

The NH_2-terminal portion of the molecule is highly conserved among all species examined, but there is considerable species diversity in the action of galanin. The chapter by McDonald *et al.* nicely addresses this issue with respect to galanin's role in inhibiting secretagogue-induced insulin release. The possibility exists that some of this diversity in the pancreas and elsewhere derives from the less conserved COOH-terminal portion of the molecule.

There is still much to be learned about galanin and its mechanisms of action. Just under the surface in many of the chapters in this volume is the idea that there may also be other galanin-like peptides yet to be discovered. Galanin has established its importance in the neuroendocrine field in less than ten years; the next ten years should be exciting.

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