PREFACE

The present three issues of *Acta Biologica Hungarica* are devoted to publication of research papers presented at the 9th Symposium of the International Society for Invertebrate Neurobiology held between 1–5 July, 1999 at Lake Balaton, Tihany, Hungary. The Balaton Limnological Research Institute of the Hungarian Academy of Sciences is the traditional place of these symposia since 1967.

Invertebrate animals, characterized by simpler nervous systems as compared to vertebrates, are not only useful models in understanding the structure and function of the human brain, but – as definite entities on the line of the evolution – they possess own distinctions, typical to the given species. In explaining the behavior characteristic to the animal not only the morphological construction, the form and way of adaptation to the outside circumstances, etc. are important, but also, beside common properties, the specific features of the neural regulation may play a role. For example, the significance of the existence of giant neurons in gastropods is not yet understood, nevertheless, it is clear, that the large soma offers a greater surface to extrasynaptic receptors and a larger reactive area for signal molecules occurring in the intercellular space, than in small neurons. It has certainly consequences in the neural communication and integration mechanisms in these animals. Another example is the regulation of muscle activity. Although the muscle contraction is based on the same molecular principles (actin-myosin interaction) in the whole animal kingdom, the neurotransmitters resulting in excitation or inhibition of muscle fibres can be different in different phyla: glutamate in insects, 5HT in molluscs, Ach in some other invertebrates and in vertebrates. The type of the transmitter substance can make distinction among species also at other levels of the neural regulation.

The papers presented at the recent ISIN Symposium give an emphasis to these “invertebrate” specificities. Studies conducted on worms, molluscs and arthropods deal in most cases with mechanisms characteristic to the given species, like chromatophore regulation, feeding in molluscs, molluscan peptides, the function of octopamin. Many of the results presented, however, concern basic problems of neurobiology, common to all animals, emphasizing the overall unity of the neuroregulatory processes and mechanisms.

The articles collected in this volume represent latest results and reflect recent ideas of research groups working since long time at this area of experimental biology.

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