Preface

This Special Issue of Acta Biochimica Polonica presents the Abstracts of Invited Lecturers, and of submitted accepted posters (several of which have been selected for short oral presentation) to the 6th International Conference on INHIBITORS OF PROTEIN KINASES (IPK’2009).

Like previous Conferences in this series, the 6th IPK is devoted to the fundamental properties of protein kinases (Insights into Protein Kinases), with special emphasis on the development of selective inhibitors of these enzymes, as well as of the corresponding protein phosphatases, and particularly their potential utility as chemotherapeutic drugs.

Reversible protein phosphorylation by protein kinases/phosphatases is the most important pathway for regulation of protein function in living cells. It is involved in the switching of cellular activities from one state to another and, in this manner, regulates gene expression, cellular proliferation and cell differentiation. It is the major mechanism whereby cells respond to extracellular signals, such as hormones and growth factors, and controls all events in the various stages of the cell cycle, as well as the response of the cell to environmental and nutritional stresses.

The key role of protein kinases (and phosphatases) in signal transduction has stimulated the search for selective inhibitors of individual kinases, of which more than 500 are coded for by the human genome. Considerable success towards this goal has been achieved with the aid of a variety of interdisciplinary approaches, both experimental and theoretical. Many such inhibitors are now widely employed for better identification of individual kinases (and phosphatases), and for delineation of signaling pathways.

Dysfunction of protein kinases (and phosphatases) is associated with numerous severe pathological states, ranging from diabetes, through inflammatory diseases, to cancer. It is consequently not surprising that the pharmaceutical and biotechnology sectors are amongst the most active participants in the design of protein kinase and phosphatase inhibitors, primarily with a view to their potential clinical applications. There are now many potent and selective inhibitors, some of which have been approved for clinical use, and many more in clinical trials.

The present IPK includes 31 lectures, each in the form of a review of a particular field, on protein kinases and phosphatases, and their inhibitors, by leading world specialists. Texts of these review lectures are to be published in a Special Issue of the international journal Biochimica Biophysica Acta (Proteins & Proteomics).

Of additional interest is the participation of a number of representatives from the biotechnology sector, and their interplay with academic participants.

As in the case of preceding IPKs, the present one includes both lectures and posters on protein kinases of pathogenic agents (bacteria, viruses, parasites), which share only limited sequence homology with their eukaryotic (host) counterparts, and are therefore very attractive targets, highly relevant to current efforts to control diseases such as malaria, and most timely in relation to the present world-wide threat of the H1N1 (so-called swine flu) virus.

The Organizing Committee wishes to express appreciation to members of the International Advisory Board for their assistance in drawing up the program, and selection of invited lecturers, and to the many contributors who have complied with our request for Abstracts that are broadly informative.

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