

Multi-author Review

Recent developments in interferon research

The Editors wish to thank Dr H. K. Hochkeppel for coordinating this review.

Introduction

H. K. Hochkeppel

Pharmaceutical Research Laboratories, Ciba-Geigy Ltd, CH-4002 Basel (Switzerland)

This collection of articles is not intended to review or update the whole interferon field; many reviews for this purpose have appeared in recent and past years. The following chapters should, rather, give the reader an insight into very recent developments in this field and discuss new, even at times controversial aspects concerning the mechanism of interferon action, and its role as a member of the super-cytokine family. The interferons were identified and defined by their ability to induce cells to inhibit viral replication and to make new proteins. In addition, it was found that interferons exert antiproliferative as well as cell regulatory activities. Because interferons influence cells of the immune system, they have also been assigned an additional, immunoregulatory role. Interferons are a heterogeneous family of proteins (interferon alpha and interferon beta or type I interferon, and interferon gamma or type II interferon). They are synthesized and secreted by a variety of cell types in response to several classes of inducers, and exert their actions through specific receptors. In this respect, they are analogous to the polypeptide hormones, the big difference, however, being that interferons are produced locally and released into microenvironments while hormones are transported to and act on distant parts of the body. In this multi-author review two chapters (K. E. Mor-

gensen et al. and S. E. Grossberg et al.), devoted to interferon receptors, attempt from somewhat different angles to shed light on the complex process of interferon interactions with their receptors as well as on the role of these receptors in interferon actions. As the reader will see, these complicated processes are just beginning to be understood, and are still open to different interpretations and speculation. No less intriguing are the interactions with other cytokines (described by G. Opdenakker et al.), and, within the cytokine network, the actions of interferon and interacting cytokines on B cells (A. Jurado et al.). Gene expression of interferons in normal and diseased tissue of man are subsequently discussed by M. G. Tovey. Specific effects of interferons or other cytokines on certain enzymes involved in defense mechanisms against pathogens (J. M. Carlin et al.) or associated with autoimmune diseases (S. Masure and G. Opdenakker) are described, followed by a discussion of the very complex activities of interleukin 6 (alias interferon beta 2) in infection and inflammation (M. Revel). The collection is concluded by a chapter on recent trends in animal models in interferon research (H. Schellekens) showing us, among other things, how little of our knowledge gained from in vitro experiments can be transferred to the in vivo situation.

The cellular receptor of the alpha-beta interferons

K. E. Mogensen, G. Uzé and P. Eid

Laboratoire d'Oncologie Virale, CNRS ER 274, 7 rue Guy Môquet, F-94802 Villejuif Cedex (France)

Summary. This is a selective review of recent trends in research on the cellular receptor for the alpha-beta interferons. It deals mainly with work published in the last three years (1985–88), and therefore mainly with receptors for the human interferons. The binding characteristics of several human alpha interferons are examined, and the importance of in vitro experimental models for establishing the relationship between receptor binding and the cellular response is emphasized.

Key words. Interferon receptor; polypeptide receptor; multiple ligands; cellular differentiation; binding response relationship.