Growth Factors and Receptors

A PRACTICAL APPROACH

Edited by

I. A. McKAY and K. D. BROWN



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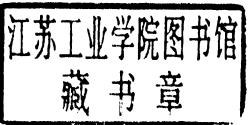
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Preface

The rapid discovery of novel growth factors over the past 30 years led to a need for standard protocols describing methods for their isolation, identification and characterization. In 1993, one of us co-edited a book in the Practical Approach Series designed to fulfil that need. Since the publication of *Growth Factors: A Practical Approach*, the demands of many researchers working in this rapidly developing field have expanded and now include not only the analysis of physiological function, but also the engineering of factors with novel activities and applications. Our aim in producing this new book, *Growth Factors and Receptors: A Practical Approach*, was to build on the success of the previous volume and to meet those new demands.

In keeping with the aims of the Practical Approach Series, our international cast of authors has provided detailed experimental protocols that describe everything from basic analytical techniques to complex *in vivo* applications. While the protocols are exemplified by reference to the proteins of greatest interest to the individual authors, they should, in most cases, be applicable to studies of a range of other growth factors.

In the Contents the reader will find a list of chapters that deal with different approaches to growth factor studies, including Chapter 1 which serves as an overall introduction to growth factors and receptors. We have included three appendices with useful information, including references to all the families and individual growth factors known to us at the time of going to press. In addition to chapters with protocols applicable to their own studies, we hope that readers will also find other chapters which will help them understand and apply techniques that they might previously have thought too esoteric.

Finally, we extend our warm thanks to all the contributors for their positive response to our, sometimes nit-picking, editing, to Geraldine Garnett-Frizelle for her excellent secretarial assistance, and to you for buying this book.

Good factoring!

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Abbreviations

adeno-associated virus AAV

Ad adenovirus

AEC 3-amino-9-ethylcarbazole APS ammonium persulfate

ATCC American Type Culture Collection brain-derived neurotrophic factor **BDNF**

5'-bromo-2'-deoxyuridine BrdU

cytomegalovirus immediate early region gene CMV-IE

cyanogen bromide **CNBr** C-reactive protein **CRP** 3D three-dimensional DAB diaminobenzidine **DEPC** diethyl pyrocarbonate

Dulbecco's modified Eagle's medium **DMEM**

dimethyl sulfoxide **DMSO**

dithiobis(succinimidyl proprionate) **DSP**

DSS disuccinimidyl suberate

1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide **EDC**

ethylenediaminetetraacetic acid EDTA

epidermal growth factor **EGF**

EGFR epidermal growth factor receptor enhanced in vitro translation **EIVT**

enzyme-linked immunosorbent assay **ELISA**

FGF fibroblast growth factor

FGFR fibroblast growth factor receptor **FITC**

fluorescein isothiocyanate

GF growth factor GH growth hormone

GM-CSF granulocyte/macrophage colony stimulating factor

GTh gene therapy GTr gene transfer

heparin binding EGF-like growth factor HB-EGF high-pressure liquid chromatography **HPLC**

HRG heregulin

IGF insulin-like growth factor

IL interleukin

 K_{d} dissociation constant **KGF** keratinocyte growth factor

LD lethal dose

MCP-1 monocyte chemoattractant protein-1

Abbreviations

MEM minimal essential medium MTD maximum tolerated dose NGF nerve growth factor

NT

neurotrophin OD optical density

polyacrylamide gel electrophoresis **PAGE**

phosphate-buffered saline **PBS** PCR polymerase chain reaction PE Pseudomonas exotoxin

Pipes piperazine-N,N'-bis(2-ethanesulfonic acid) RAC Recombinant DNA Advisory Committee

RIA radioimmunoassay

RNase ribonuclease

RP-HPLC reverse-phase high-pressure liquid chromatography RT-PCR reverse transcription polymerase chain reaction

SAP saporin

structure-activity relationships SAR SB^3 bis(sulfosuccinimidyl)suberate **SEAP** secreted alkaline phosphatase

SELEX systematic evolution of ligands by exponential enrichment

TAMIA tag-mediated immunoprecipitation assays

TCA trichloroacetic acid

N,N,N',N'-tetramethylethylenediamine **TEMED**

TFA trifluoroacetic acid

TGF transforming growth factor

VEGF vascular endothelial growth factor VPF vascular permeability factor

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