Growth Factors and Receptors

A PRACTICAL APPROACH

Edited by
I. A. McKAY and K. D. BROWN

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Growth Factors and Receptors

A Practical Approach

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and

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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

AAV	adeno-associated virus
Ad	adenovirus
AEC	3-amino-9-ethylcarbazole
APS	ammonium persulfate
ATCC	American Type Culture Collection
BDNF	brain-derived neurotrophic factor
BrdU	5′-bromo-2′-deoxyuridine
CMV-IE	cytomegalovirus immediate early region gene
CNBr	cyanogen bromide
CRP	C-reactive protein
3D	three-dimensional
DAB	diaminobenzidine
DEPC	diethyl pyrocarbonate
DMEM	Dulbecco's modified Eagle's medium
DMSO	dimethyl sulfoxide
DSP	dithio*bis*(succinimidyl proprionate)
DSS	disuccinimidyl suberate
EDC	1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide
EDTA	ethylenediaminetetraacetic acid
EGF	epidermal growth factor
EGFR	epidermal growth factor receptor
EIVT	enhanced *in vitro* translation
ELISA	enzyme-linked immunosorbent assay
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
HB-EGF	heparin binding EGF-like growth factor
HPLC	high-pressure liquid chromatography
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

MEM	minimal essential medium
MTD	maximum tolerated dose
NGF	nerve growth factor
NT	neurotrophin
OD	optical density
PAGE	polyacrylamide gel electrophoresis
PBS	phosphate-buffered saline
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
SAR	structure–activity relationships
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
TEMED	*N*,*N*,*N*′,*N*′-tetramethylethylenediamine
TFA	trifluoroacetic acid
TGF	transforming growth factor
VEGF	vascular endothelial growth factor
VPF	vascular permeability factor

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