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Anticlastogens in Mammalian and Human Cells

With 16 Figures and 19 Tables

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Preface

Antimutagenesis, because of its intricate relationship with anticarcinogenesis and its significance in genetic disease, but also in cancer and perhaps even in aging, has experienced a renaissance during the last 10 years. Its roots, however, go back to the fifties, when Novick and Szilard created the term "antimutagenesis", and when protection by antimutagens also of chromosome structure from the detrimental effects of ionizing radiation and certain chemical mutagens was reported first.

Indeed, an important part of all efforts in the field of antimutagenesis research was contributed by studies on anticlastogenesis, i.e. the reduction of the amount of chromosome damage induced by mutagens. Both authors were involved in this type of research performed on human and mammalian cells from its very beginning.

As a lucky chance (i.e. a visiting grant of Deutscher Akademischer Austauschdienst – DAAD) led Ruben Arutyunyan to my lab, we decided to invest our years of experience into this summarizing book. The result of this cooperation, naturally cannot be absolutely exhaustive, as we had to try a short summary of all data available to us, but also to concentrate on selected aspects of anticlastogenesis research. Obviously such a selection will turn out to be subjective, but we seriously exerted ourselves to cover as many aspects of anticlastogenesis as possible. We hope that our original intention will be fulfilled by our book, i.e. to draw the attention of many scientists and students to this advanced field of research which, nevertheless, still seems very promising to us, and to advance understanding of the complex processes and interrelationships of anticlastogenesis, and antimutagenesis.

It is our desire to give our thanks to all our colleagues who allowed us to include into this book their unpublished data or parts of their publications, but also to those who encouraged us by valuable advice and discussions. We greatly acknowledge the financial support of R. A.'s stay in Erlangen by DAAD which was a basic requirement for writing this book. Last, but not least, we are also indebted to the publisher for the extremely good cooperation.

Erlangen, May 1991

Prof. Dr. E. GEBHART
(on behalf of the authors)

Contents

Abbreviations

AET	β-Aminoethylisothiouronium
AMSA	amsacrine
Ara-C	cytosine arabinoside
BaP	benzo⟨α⟩pyrene
BLM	bleomycin
BrdUrd	5-bromodeoxyuridine
CHO	Chinese hamster ovary cell line
COL	colchicin
DEB	diepoxybutane
DMBA	dimethylbenz⟨α⟩anthracene
DNA	deoxyribonucleic acid
EMS	ethylmethane sulfonate
G0	stationary stage of interphase
G1	prereplicative phase of interphase
S	replication phase of interphase
G2	postreplicative phase of interphase
h	hour
HCT	homocysteine thiolactone
HN2	nitrogen mustard
8-HQS	8-hydroxyquinoline sulfate
ICPEMC	International Commission for Protection Against Environmental Mutagens and Carcinogens
M	Molar
MMC	mitomycin C
MMS	methylmethane sulfonate
MNNG	N-methyl-N′-nitro-N-nitrosoguanidine
NAC	N-acetylcysteine
NaF	sodium fluoride
NHAAF	N-hydroxyacetylaminofluorene
NMU	nitrosomethylurea
NQO	4-nitroquinoline-1-oxide
PCC	premature chromosome condensation
PCZ	Procarbazin
PVP	polyvinylpyrrolidone
SCE	sister chromatid exchange
TEM	triethylenemelamine

TEPA	triethylenephosphamide
ThioTEPA	triethylenethiophosphamide
TPA	tetradecanoylphorbolacetate
TR	trenimon
UV	ultraviolet
VINC	vincristin
WR 2721	S-2-(3-aminopropylamine)ethylthiophosphate