

# **Genetic Consequences of Nucleotide Pool Imbalance**

*Edited by  
Frederick J. de Serres*



# Genetic Consequences Of Nucleotide Pool Imbalance

**Avril Woodhead**



## **Genetic Consequences Of Nucleotide Pool Imbalance:**

Genetic Consequences of Nucleotide Pool Imbalance Frederick De Serres, 2012-12-06 This book is concerned with the genetic consequences of nucleotide pool imbalance. There are a number of ways in which this state can be achieved and the majority of papers in this volume describe the effects of nucleotide pool imbalance on DNA replication and repair and the induction of gene mutations in various organisms. This book grew out of a Conference on Genetic Consequences of Nucleotide Pool Imbalance which was held at the National Institute of Environmental Health Sciences on May 9-11, 1983. The Organizing Committee consisted of Drs. Diana Anderson, BIBRA; Robert Haynes, York University; Bernard Kunz, NIEHS; Barry Glickman, NIEHS; and Frederick J. de Serres, NIEHS Chairman. The meeting was organized by the staff of the Office of the Associate Director for Genetics and was financed solely by the National Institute of Environmental Health Sciences. Frederick J. de Serres, Ph.D., Associate Director for Genetics.

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Multiple Mechanisms of Adenosine Toxicity in an Adenosine-Sensitive Mutant of Baby Hamster 103 Kidney BHK Cells

**Assessment of Risk from Low-Level Exposure to Radiation and Chemicals** A. D. Woodhead, 2013-11-21 The present workshop had its origins in discussions among Alexander Hollaender, Oddvar Nygaard, Donald Borg, Richard Setlow, and Victor Bond on the need for a symposium that would deal with a broad spectrum of pressing subjects related to the physics, chemistry, and biological actions of ionizing radiations and the theoretical and practical problems of risk assessment. It soon became apparent that the spectrum of subjects considered was too broad for the desired depth of coverage; in fact, it seemed unlikely that the conference participants would have the background knowledge to span the gamut. Therefore, two separate meetings were decided upon, the first of which, Comparison of Mechanisms of Carcinogenesis by Radiation and Chemical Agents, was held at the National Bureau of Standards, Gaithersburg, on December 6-7, 1983. The meeting was sponsored by the NCI. The second meeting has emerged as the present workshop at Brookhaven National Laboratory. An interface between the two conferences has been provided by Michael Fry and Donald Borg, who have summarized the salient points emanating from the NCI Symposium. We intended that the first conference should focus on the basic mechanisms of radiation and chemical carcinogenesis, while the second, the present meeting, would emphasize exposure-response relationships, particularly the theoretical and practical similarities and differences between exposure to chemical carcinogens compared to exposure to ionizing radiation.

Evolution of Longevity in Animals Avril Woodhead, 2013-03-07 The analysis of intra-group correlations between LS and BW at representative intervals yields no consistent support for the hypothesis that lower BW is associated

with longer LS Indeed among male Wistar rats and C57BL 6J and A J mice followed since weaning on AL diets the data suggested that relatively higher BW across the adult LS was generally associated with longer life Even when the diet was restricted by EOD or RES regimens this pattern of positive correlations between LS and BW persisted for the C57BL 6J and A J strains when relative ages were analyzed However when BW at absolute ages were correlated with LS support for the positive relationship between BW and LS was not as forthcoming When AL groups were assessed beginning at later ages 10 months the pattern of positive correlations was very evident for the Wistar rats heavier rats tended to live longer This pattern was also evident among AL fed C57BL 6J mice followed since 6 months but was lost in the 10 month group in this strain Among A J mice on AL diets the pattern became somewhat negative when followed at 6 and 10 months of age However among both C57BL 6J and A J mice placed on EOD diets at 6 and 10 months of age the pattern clearly tended toward the positive

Phenotypic Variation in Populations Avril Woodhead,2012-12-06 The human race has enormous heterogeneity founded on genetic and environmental sources Variability therefore is a vital dimension in any consideration of human risk assessment In the estimation of risks current methods of extrapolation based upon converting the response of a median man are inadequate as they ignore phenotypic variation and therefore susceptible subgroups There is a growing literature defining the extent of human variation in normal populations thus the normal young adult population may have 10-20% known hyperreactors How far can we ignore human variability in risk assessment Should we be concerned with susceptible groups and how can we modify the risk assessment analysis accordingly The aim of our meeting was to bring together experts from the fields of human epidemiology toxicology aging genetics carcinogenesis and teratology and to provide a forum in which we might assimilate knowledge of human heterogeneity as a coherent whole Since the resolution and obligations of risk assessment in the last analysis are a political process we also involved representatives from the legal field the unions and the regulatory agencies We are most grateful for financial support from the National Institute on Aging the U S Environmental Protection Agency the U S Department of Energy FDA National Center for Toxicological Research The Council for Tobacco Research USA Inc Johnson and Johnson Merck Sharp and Dohme Research Laboratories and Associated Universities Inc We thank our Symposium Coordinator Ms

Basic and Applied Mutagenesis A. Muhammed,2012-12-06 The aim of the editors of this volume is to use basic and applied studies in the field of mutagenesis to approach a problem of especial concern The problem is that of the usage of toxic chemicals particularly agricultural chemicals in ever increasing quantities in those parts of the world that feed the most people Agricultural chemicals that are in use in Pakistan are emphasized here These are the same chemicals that are in use throughout the developing world although the quantities of the different types that are used may vary from country to country and from region to region within countries A number of these chemicals can no longer be sold in Europe or in the United States and it is often difficult to identify a scientific reason as to why they are sold at all It is ironic that toxic chemicals are used as a humanitarian device to rid the world of Pestilence

and Famine two of the Horsemen of the Apocalypse If we do not wish poisonous chemicals to become the fifth Horseman of the Apocalypse then we must begin now to identify and regulate the large scale usage of toxic substances everywhere

**Antimutagenesis and Anticarcinogenesis Mechanisms** Delbert M. Shankel, Philip E. Hartman, Tsuneo Kada, Alexander Hollaender, Claire M. Wilson, Gregory Kuny, 2013-03-13 *Nutrition and Cancer Prevention* Atif B. Awad, Peter G. Bradford, 2005-09-19 Epidemiological studies have estimated that approximately 35 percent of cancers are potentially avoidable by nutritional modification These modifications include strategies such as caloric restriction and limitation of specific macro nutrient groups However recent research indicates that what you eat may well be just as important as what you s

**Progress in Plant Cellular and Molecular Biology** H.J. Nijkamp, L.H.W. van der Plas, J. van Aartrijk, 2012-12-06 Plants are an important source of food and of valuable products for industry agriculture and medicine They are unique in many aspects of metabolic processes development and reproduction Most of these aspects can now be studied by the modern methods and technologies of molecular and cellular biology Such studies are also encouraged as to improve plant yield and quality During the past decade research in plant sciences has demonstrated the feasibility of plant cell and tissue culture techniques as major tools in biology and agriculture These techniques are also essential in strategies for engineering of biological systems The proceedings of the VII International Congress on Plant Tissue and Cell Culture in Amsterdam show that in recent years an impressive progress has been achieved The papers of the congress with more than 2000 participants include the full text of plenary lectures keynote lectures and presentations of speakers who have been selected out of more than 1400 abstracts This combination which provides readers with reviews as well as recent findings and future developments captures an important part of the scientific exchange during the congress The papers in these proceedings are a reflection of the role of plant cell and tissue culture in disciplines varying from plant breeding to molecular biology Basic as well as applied studies in a variety of plant disciplines are presented in 4 sections 1 Genetic manipulation and propagation 2 Morphogenesis and metabolism 3 Secondary metabolites and 4 Biotechnology and developing countries

*Advances in Cancer Research*, 1992-12-17 *Advances in Cancer Research* *Current Catalog* National Library of Medicine (U.S.), 1985 First multi year cumulation covers six years 1965 70 **National Library of Medicine Current Catalog** National Library of Medicine (U.S.), 1985 *Energy Research Abstracts*, 1983 **Issues in Genetic Medicine: 2011 Edition**, 2012-01-09 Issues in Genetic Medicine 2011 Edition is a ScholarlyEditions eBook that delivers timely authoritative and comprehensive information about Genetic Medicine The editors have built Issues in Genetic Medicine 2011 Edition on the vast information databases of ScholarlyNews You can expect the information about Genetic Medicine in this eBook to be deeper than what you can access anywhere else as well as consistently reliable authoritative informed and relevant The content of Issues in Genetic Medicine 2011 Edition has been produced by the world's leading scientists engineers analysts research institutions and companies All of the content is from peer reviewed sources and all of it is

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**Progress in Nucleic Acid Research and Molecular Biology**, 1986-11-06 Progress in Nucleic Acid Research and Molecular Biology *Enzyme Dynamics and Regulation* P. Boon Chock, Charles Y. Huang, C.L. Tsou, Jerry H. Wang, 2012-12-06 Recent developments in concepts and techniques have brought enzyme research to a changing yet exciting stage Enzymes have served as indispensable tools in the phenomenal rise of molecular biology and the resultant biotechnology thrusts enzymes to new heights and territories This volume the proceedings of a recent symposium on the Dynamics of Soluble and Immobilized Enzyme Systems provides a current overview of the field to help scientists utilize long established and newly acquired information Biological Reactive Intermediates IV Charlotte M. Witmer, Robert R. Snyder, David J. Jollow, George F. Kalf, James J. Kocsis, 2013-03-09 The finding that chemicals can be metabolically activated to yield reactive chemical species capable of covalently binding to cellular macromolecules and the concept that these reactions could initiate toxicological and carcinogenic events stimulated a meeting by a small group of toxicologists at the University of Turku in Finland in 1975 Jollow et al 1977 The growing interest in this field of research led to subsequent symposia at the University of Surrey in England in 1980 Snyder et al 1982 and the University of Maryland in the U S A in 1985 Kocsis et al 1986 The Fourth International Symposium on Biological Reactive Intermediates was hosted by the Center for Toxicology at the University of Arizona and convened in Tucson Arizona January 14 17 1990 Over 300 people attended There were 60 platform presentations by invited speakers and 96 volunteer communications in the form of posters were offered These meetings have grown from a small group of scientists working in closely related areas to a major international series of symposia which convene every five years to review and place in context the latest advances in our understanding of the formation fate and consequences of biological reactive intermediates The Organizing Committee Allan H Conney Robert Snyder Co chairman and Charlotte M Witmer Rutgers University Piscataway NJ David J Jollow Co chairman Medical University South Carolina Charleston SC 1 Glenn Sipes Co chairman University of Arizona Tucson AZ James J Kocsis and George F DNA Replication Arthur Kornberg, Tania A. Baker, 2005-06-24 DNA Replication second edition a classic of modern science is now back in print in a paperback edition Kornberg and Baker's insightful coverage of DNA replication and related cellular processes have made this the standard reference in the field **The Early Effects of Radiation on DNA** E.M. Fielden, P. O'Neill, 2013-06-29 Interest in the biological effects of ionising radiation closely followed the identification of such radiation The realisation that DNA is the site of genetic information in cells subsequently focussed attention on DNA as an important target in the lethal and mutagenic effects of ionising radiation Thus radiation effects upon DNA became an important area for fundamental scientific studies by radiation biologists chemists and physicists To a first approximation the concerns of the three disciplines can be divided by time scales the physical process of energy deposition from photon or

charged 16 12 particle and subsequent relaxation 10 to 10 secs followed by chemical 12 2 reactions 10 to 10 secs and finally the expression of biological effect minutes to years Thus the concept of early processes conveys different ideas to different scientists although they are all interrelated To attempt to describe in any detail all these processes is a mammoth task which is not made easier by the different conventions and experimental approaches of the three disciplines However the recent advances in all these scientific areas seemed to the organisers at least to offer the opportunity to stimulate more active interaction between physicists chemists and biologists With this in mind a multi disciplinary workshop was organised which brought together some fifty scientists to present their own specialist interests and through extensive discussion explore which problems are of high priority and require input from the different disciplines to resolve them

**New Trends in Genetic Risk Assessment** G. Jolles,A. Cordier,2013-10-22 New Trends in Genetic Risk Assessment is based on the Fifth International Round Table of the Rh ne Poulenc Sant Foundation held in Nice 1987 The conference was an attempt to review the latest theories and mechanisms stipulated for the various aspects of genotoxicity it was above all an open forum to discuss the new trends the new tests and the new battery of tests for assessing the genetic risk of chemicals and especially drugs This volume is actually not a proceedings of the meeting but a monograph specially edited to report the reviews which were presented and the discussions which took place it was designed to provide a better understanding of the knowledge obtained in the most recent years and to help in the practical choice of approaches or tests for the prediction of the various forms of genotoxicity The main subjects of this review concern molecular analysis of mutagenesis detection of DNA damage gene mutation clastogenesis aneuploidy and germ cells Each theme is preceded by a short overview summarizing the state of the art and the contributions of each author Finally special attention was given to the personal views of some leading toxicologists as to the battery of tests presently available or recommended

**Mechanisms of DNA Damage and Repair** Michael G. Simic, Lawrence Grossman, Arthur C. Upton, David S. Bergtold, 2013-11-21 This book is based on the papers presented at the conference on Mechanisms of DNA Damage and Repair Implications for Carcinogenesis and Risk Assessment held at the National Bureau of Standards on June 2 7 1985 This volume deals with mechanisms of DNA damage and repair at the molecular level consequences of unrepaired or misrepaired damage with major emphasis on carcinogenesis drugs which bind selectively to altered and potentially damaging DNA sequences and potential utilization of DNA damage as an endpoint for assessing risks of UV light ionizing radiations chemicals drugs and hazardous agents in foods Because the induction of mutations by radiation and genotoxic chemicals has been observed to follow one hit kinetics in some instances it is generally assumed that any level of exposure to a DNA damaging agent may increase the risk of genetic disease or cancer in an exposed population At the same time however there is evidence that although the DNA of living cells is continually damaged by natural background radiation free radicals and other naturally occurring processes most of the damage is normally repaired

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