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FOREWORD

All Living entities, including microbes, plants and animals are constantly exposed to ionizing radiations originating from natural sources such as cosmic rays and from radionuclides in the earth's crust, air, food, water and the human body itself. In addition to natural radiation, which constitutes 90% of the radiation, result of human activities and medical diagnosis/therapy may cause radiation exposure. Hence, radiation is an integral part of our daily life which makes it imperative to comprehend its effects on biological systems and also use them to our advantage.

Today, as we completed 75 years of India's Independence, it is irrefutable that 'nuclear power' and 'nuclear technologies for non-power applications' in various fields such as agriculture, food security, healthcare and industry will play a pivotal role in the future socio-economic development of India. Mindful of the fact that the successful implementation of the “Three stage Indian Nuclear Power Program” requires the support of an effective R&D program in the field of Bio-sciences, as envisioned by Dr. Homi Jehangir Bhabha, who initiated biological research in the Department of Atomic Energy in 1948. Towards this objective, Dr. A. R. Gopal-Ayengar was recruited by Atomic Energy Commission as Head, Cell Biology Unit and subsequently appointed as Director, Biology Group of Atomic Energy Establishment, Trombay.

The foundation laid by Dr. A. R. Gopal-Ayengar during fifties and sixties heralded the future of multi-disciplinary biological research in DAE in several fields including radiation medicine, mutation breeding, radiation biology, cytogenetics, biophysics, molecular biology, food technology, cancer research etc. The subsequent 50 years (1973-2023) witnessed exponential growth of biological research in DAE in terms of its contribution towards both basic as well as applied research and marked the 'golden era' of Bio-science Group of BARC.

This book is an exhaustive account of the tremendous strides made by Bio-science Group and the successes and achievements of DAE scientists in the field of biological research. The editors of this book, Dr. Tapan K. Ghanty and Dr. Santosh K. Sandur, must be complimented for their efforts in collating the R&D activities and achievements of DAE in biological research. I am sure that the readers will appreciate and enjoy the accomplishments as they journey through the multidisciplinary research expounded in this book.

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