



Paul Berg, on his 65th birthday, speaking at the Symposium organised in honour of the occasion.

Foreword

Paul Berg was born on 30th June 1926 in New York City. He grew up in the Brooklyn community of Seagate and attended the Abraham Lincoln High School, which had, some years earlier, numbered Arthur Kornberg amongst its pupils. Paul's undergraduate study at Pennsylvania State College was interrupted by service in the United States Navy but he graduated with a B.S. in biochemistry in 1948 and then went to Western Reserve University in Cleveland to work for his Ph.D with Warwick Sakami and Harland Wood. His thesis work was concerned with one carbon metabolism and he pursued his interest in metabolic biochemistry during a Post-Doctoral period in Herman Kalckar's laboratory at the Institute of Cytophysiology in Copenhagen, where he worked on nucleoside diphosphokinase. A second Post-Doctoral year was spent with Arthur Kornberg in the Department of Microbiology at Washington University in St. Louis. During this period Paul's interest in the synthesis of acetyl-CoA led him to study acyl adenylates and from there it was but a brief step to aminoacyl adenylates and thus to the enzymes that we now know as aminoacyl-tRNA synthetases, and an interest in the mechanisms that underlie the transfer of genetic information that has remained to the present. In 1955 Paul was appointed to the Faculty of the Department of Microbiology and in 1959 he moved to the new Department of Biochemistry at Stanford University Medical School where he has remained. He is currently Willson Professor of Biochemistry and Director of the Beckman Center for Molecular and Genetic Medicine.

Paul's contributions to the study of nucleic acids are enormous. For many years he undertook outstanding studies of aminoacyl-tRNA synthetases, and of the mechanisms of genetic suppression, and he also worked extensively on RNA polymerase. In 1967 he went to the Salk Institute for a sabbatical year in Renato Dulbecco's laboratory with the intention of learning about polyoma, a newly characterised virus which, because of its small genome size and ease of growth in cell culture, seemed to offer the opportunity of applying the experimental approaches that had been so successful with bacteriophage to the study of eukaryotic genes. On his return to Stanford, Paul began to work with the closely related monkey virus, SV40, and soon realised that the enzymology that had always been his first love could be applied to the manipulation of the viral genome and to the construction of recombinant DNA molecules. There soon followed the seminal paper that described for the first time the joining together of two unrelated DNA molecules and a major body of work in which the power of nucleic acid enzymology was deployed in the mapping of the viral genome and in the construction of predetermined mutations.

These first recombinant DNA experiments excited enormous interest, and apprehension, both within and without the scientific community. Paul played a leading role in the discussions of both the safety and the ethics of the new work and was instrumental in the establishment of the guidelines that allowed the science to move forward in a fashion that society as a whole found acceptable. Once the moratorium was lifted Paul's laboratory was at the forefront of the development of vector systems for mammalian cells and he continued throughout the 1980s to pursue the refinement of such systems, focussing most recently on vectors for homologous recombination and on the mechanisms of recombination.

Paul's work has been recognised by the international scientific community with many awards, most notably the Eli Lilly Prize of the American Chemical Society in 1959, the Albert Lasker Basic Medical Research Award in 1980 and the Nobel Prize in Chemistry, also in 1980. The Nobel Committee cited him for his 'fundamental studies of the biochemistry of nucleic acids, with particular regard to recombinant DNA'.

These public facts tell only part of the story. For those of us privileged to have worked in his laboratory, Paul defines all that is good about the pursuit of science. A fierce critic, as much of himself as of others, yet a wonderful supporter and a source of continuous encouragement; an inspired teacher and a marvellous friend and colleague. Above all, he taught us how to do science properly and responsibly.

All of the papers in this special issue of Nucleic Acids Research are authored by former students, post-doctoral fellows and sabbatical colleagues of Paul's. We dedicated this volume to him, in honour of his 65th birthday, with profound thanks for all that he has done for us and in recognition of his outstanding contributions to our knowledge of the nucleic acids.

Peter Rigby
Tom Shenk