C U R R I C U L U M V I T A E

KENNETH ALLEN JOHNSON
Roger Williams Centennial Professor of Biochemistry
Department of Molecular Biosciences
2500 Speedway, A5000, MBB 3.122
The University of Texas at Austin
Austin, Texas 78712

ACADEMIC TRAINING

University of Iowa	BS	1971	Chemistry, with highest honors and with highest distinction.
University of Wisconsin	Ph.D.	1975	Molecular Biology. Advisor: Dr. Gary Borisy Thesis Title: The Mechanism of Microtubule Assembly
University of Chicago	Postdoc	1979	With Edwin W. Taylor

OCCUPATIONAL RECORD

1998 - present	**Roger Williams Centennial Professor**, Institute for Cellular and Molecular Biology, Dept. of Chemistry & Biochemistry, University of Texas at Austin, Austin, TX
1987-1998	**Paul Berg Professor of Biochemistry** Department of Biochemistry and Molecular Biology, The Pennsylvania State University, University Park, PA
1984-1987	**Associate Professor**, Department of Molecular and Cell Biology, The Pennsylvania State University, University Park, PA
1979-1984	**Assistant Professor**, Department of Biochemistry and Biophysics, The Pennsylvania State University, University Park, PA
1975-1979	**Postdoctoral Fellow**, Department of Biophysics and Theoretical Biology, The University of Chicago, Chicago, IL (with Dr. Edwin W. Taylor)

HONORS AND AWARDS

2018	Fellow of the Biophysical Society
2017	Distinguished Alumnus, Davenport Central High School, Davenport, Iowa
2012	Vincent du Vigneaud Honorary Lectureship, University of Rochester
2007	Fellow of the American Association for the Advancement of Science
2000	Joseph Coleman Memorial Lecturer, Yale University, October 30, 2000
1998	Roger Williams Professorship, University of Texas at Austin
1989	Pfizer Award in Enzyme Chemistry, American Chemical Society
1987	Paul Berg Professorship, Pennsylvania State University
1987	Penn State Faculty Scholar Medal for Life and Medical Sciences
1983-1988	American Heart Association Established Inv
1979	Muscular Dystrophy Association Postdoctor
1976-1979	National Institutes of Health Postdoctoral Fe
1971	Phi Beta Kappa

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1971	Chemistry Faculty Undergraduate Scholar Award
1967-1971	Thomas Dooley Memorial Scholarship

COMMITTEES

National and International Committees

2015	Chair, Enzyme Mechanisms Conference
2001-2006	Member of Editorial Board of the Journal of Biological Chemistry
1996-2004	External reviewer for DFG Priority Program on Molecular Motors (Germany)
1998	Ad Hoc member of AIDS Study Section, National Institutes of Health
1997	Program Chair, Biological Division of American Chemical Society
1996	Chair, Gordon Conference on Biopolymers
1989-1998	Brookhaven STEM/NIH Advisory Committee
1992	Chair, Gordon Conference on Enzymes, Coenzymes & Metabolic Pathways
1987-1988	American Heart Association Grant Review Panel
1986-1991	Member of Cell Biology Study Section, National Institutes of Health
1986	Review Panel for the New Jersey Dept. of Higher Education
1985-1988	Monitoring Editor for the Journal of Cell Biology
1983	Organizing committee for the Cytoplasmic Matrix Conference
1983	Ad Hoc member of Cell Biology Study Section, NIH

University Committees

2016-2019	Head, Biochemistry Graduate Studies Committee
2015-2018	Faculty Workload Committee
2013-2017	Chair, Graduate Student Travel Award Committee
2007-2010	Member, Advisory Board of Institute for Cellular & Molecular Biology
2006-2008	Department of Chemistry and Biochemistry Promotion and Tenure Committee
2006-2008	College Science Promotion and Tenure Committee
2005	College Committee for MGM Department research space assignment
2004	Chair, College Review of Organized Research Units
2004	Chair, Review of Waggoner Alcohol Addiction Center
1999-2004	Institute for Cell & Molecular Biology Advisory Committee
1999-2003	Coordinator for Biochemistry Division of Chemistry & Biochemistry Dept.
2002	Chair, Chemistry & Biochemistry Search Committee
2001	Chair, Chemistry & Biochemistry Search Committee
1999	Chair, Chemistry & Biochemistry Search Committee
1996	College of Science Promotion and Tenure Committee
1994-1996	Departmental Promotion and Tenure Committee
1994-1998	Endowed Faculty Search Committee

1993-1996	Faculty Search Committee, Chairman
1992	Endowed Faculty Position Search Committee, Chairman
1991	Faculty Search Committee
1990	Graduate Student Search Committee, Chairman
1989	College of Science Promotion and Tenure Committee
1988-1989	Departmental Nominations Committee, Chairman
1987-1989	Departmental Headship Search Committee, Chairman
1987-1989	College of Science Dean Search Committee
1987	Departmental Graduate Candidacy, Chairman
1987	Departmental Promotion and Tenure Committee, Chairman
1986	Biochemistry Program Graduate Candidacy, Chairman
1985-1986	Graduate Student Admissions
1985-1986	Faculty Search Committee
1980-1983	Graduate Student Admissions

CONSULTING ACTIVITIES

1987-present	President, KinTek Corporation, State College, PA
2005-present	Consultant and Member of Scientific Advisory Board of Pacific Biosciences
2011-2014	Consultant, Novartis Vaccines & Diagnostics, Emeryville, CA
2008-2012	Consultant, Roche Pharmaceuticals, Palo Alto, CA and Nutley, NJ
2007	Fish & Richardson – Expert witness for patent lawsuit on the use of reverse transcriptase in PCR.
2005	Drinkler Biddle & Reath – expert witness on lawsuit relating to the toxicity of AZT in treating AIDS.
2004	Fish & Richardson – expert witness on patent infringement lawsuit involving use of polymerases in PCR
2003-2004	Consultant for Applied Biosystems Group, Applera Corp
1994-2001	Consultant for Applied Biosystems Division, Perkin Elmer Corporation, Foster City, CA
1999-2001	Consultant for Schering-Plough
1996-1997	Expert witness for PCR patent law for Finnegan, Henderson, Farabow, Garrett & Dunner, Washington, DC
1987-1990	Consultant for Monsanto Agricultural Co., St. Louis, MO

RESEARCH INTERESTS

Research in the Johnson Lab is focused on three different areas. The projects are linked by the common thread of using transient kinetic methods to examine enzyme reaction pathways and to relate our kinetic and functional analysis to enzyme structure.

HIV Reverse Transcriptase mechanism, fidelity, inhibition and drug resistance. In previous work we have established the elementary steps leading to correct nucleotide incorporation by HIV reverse transcriptase and have quantified the changes in individual kinetic constants occurring during misincorporation. In addition, we have determined the mechanism of action of a class of nonnucleoside inhibitors and characterized changes leading to resistance against these agents. In current work, we are continuing to explore the mechanisms of multiple drug resistance and had provided an understanding of the role of enzyme conformational changes in enzyme specificity. A better understanding of these phenomena at the structural and mechanistic level can lead to the development of better combination therapies in the treatment of AIDS.

Mitochondrial DNA Polymerase mechanism, fidelity and inhibition by nucleoside analogs. Several studies point to the likely role of the mitochondrial DNA polymerase in the toxicity of nucleoside analogs used in the treatment of viral infections such as hepatitis and AIDS. We have established that the toxicity of nucleoside analogs is correlated with their incorporation into mitochondrial DNA by the mitochondrial polymerase, spanning six orders of magnitude. We are currently examining the role of mutations in the human mitochondrial DNA polymerase that are linked to heritable human diseases. Our studies include detailed kinetic analysis of mutants and unique physiological studies in humanized yeast where the yeast mitochondrial DNA polymerase is replaced with the human orthologue.

Mechanism of RNA-dependent RNA replication by the Hepatitis C viral polymerase. Hepatitis C infect 3% of the worlds population and chronic infection leads to liver cirrhosis and cancer. We are currently working to understand the mechanisms of initiation and elongation of RNA polymerization and the mechanisms of action of drugs currently under development. Here we take advantage of our recent success in finding conditions for the formation of a stable, highly active elongation complex. We showed how the kinetics of incorporation versus nucleotide-dependent excision explain why Sofosbuvir (a UMP analog) is an effective drug, while a similar cytosine analog fails.

Mechanistic basis for CRISPR-Cas9 specificity. CRISPR-Cas9 offers the promise of effective gene therapy, but it is limited by off-target effects. In our current work, we are investigating the kinetic and thermodynamic basis of enzyme specificity and evaluating several “high fidelity” variants. This work provides a guide for enzymes with improved specificity.

SARS-CoV-2 RNA-dependent RNA polymerase. In our current work we have reconstituted the viral polymerase and have provide kinetic analysis to explain why Remdesevir is an effective inhibitor used to treat COVID-19. This work lays the foundation for development of new direct acting antiviral drugs.

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