

CURRICULUM VITAE

NAME : **Muhammad Anwar Waqar**

TITLE : Senior Professor of Biochemistry &
HEC Distinguished National Professor

ADDRESS

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PERSONAL & FAMILY

Date of Birth : June 15, 1941
Place of Birth : Batala, British India
Marital Status : Married, Four children

EDUCATION

1963 : *B.Sc. (Honours)*, Punjab University, Lahore,
Pakistan.
Field: Biochemical Sciences.

1964 : *M.Sc.*, Punjab University, Lahore, Pakistan.
Field: Biochemistry.

1973 : *Ph.D.*, The Flinders University of South
Australia, Bedford Park,
South Australia, Australia.
Field: Biochemistry.

1972-76 : *Postdoctoral Fellow*, Massachusetts Institute
of Technology (MIT),
Cambridge, Massachusetts.
Field : Eukaryotic DNA Replication.

HONOURS, AWARDS & MEDALS

- 1969 - 1972 Flinders University *Postgraduate Fellowship*.
- Jan.- Mar. 1982 *Advisor* in the Department of Zoology, University of the Punjab, Lahore, Pakistan, under the United Nations Development Programme/Transfer of Know-How Through Expatriate Nationals (UNDP/TOKTEN).
- December 1987 Elected to the Fellowship of Pakistan Academy of Medical Sciences (PAMS).
- March 1991 Elected to the Fellowship of the Institute of Biology (IOB), London.
- June 1991 Won the *First Award* for publication of articles in the discipline of Biological Sciences under the scheme: *Incentive for Publication of Articles in International Journals*, by National Book Council of Pakistan, Ministry of Education, and Govt. of Pakistan.
- August 1991 Won *Scientist of the Year Award* and honoured with Prime Minister's Gold Medal, by National Book Council of Pakistan, Ministry of Education, Government of Pakistan.
- March 1992 Conferred with the Civil award (a presidential award given by the Government of Pakistan) *Tamgha-i-Imtiaz* in recognition of services in the field of Biomedicine.
- October 1991 Elected to the Corresponding Fellowship of the Academy of Sciences for the Developing World (TWAS), Trieste, Italy.
- December 1991 Invited by the Institute of Fundamental Studies, Sri Lanka to serve as an *observer and evaluator* of a workshop on the feasibility of introducing Biotechnology to the school curriculum. The UNESCO sponsored this workshop. I served in the panel of educators, which prepared the final recommendations. Other members of the panel included representatives from Germany, India, Nepal, Thailand and Sri Lanka.
- December 1992 Awarded the Gold Medal in the field of Chemistry for 1992 by the Council of the Pakistan Academy of Sciences (PAS), on the recommendation of the Selection Committee, as a token of recognition for contributions and research in the subject.
- December 1992 Pakistan Academy of Medical Sciences (PAMS) for the Oration in the meeting of the Academy held on December 19, 1992. This oration lead to the conferment of Professorship of the Academy.
- March 1993 Elected to the Fellowship (Full Membership) of the Academy of Sciences for the Developing World (TWAS), Trieste, Italy.
- September 1993 Awarded the 1993 Convocation Medal of the Flinders University of South Australia, Adelaide, Australia, in the field of Biochemistry.

December 1993	Elected to the Fellowship of the Pakistan Institute of Chemists (PIC) by the Executive Council of the Institute.
January 1994	Elected to the Fellowship of the Chemical Society of Pakistan (CSP).
February 1994	Winner of the 7th International Khwarizmi Prize (1994) for contributions towards research and was awarded with the prize and plaque by the President of the Islamic Republic of Iran.
November 1995	Elected to the Fellowship of the Pakistan Academy of Sciences (PAS).
May 1998	Elected to the Fellowship of the World Academy of Art and Science (WAAS), Minneapolis, Minnesota, USA.
May 1999	Elected to the Fellowship of the Pakistan Society for Biochemistry and Molecular Biology (PSBMB).
December 1999	Elected to the life fellowship of the Zoological Society of Pakistan (ZSP).
March 2000	Conferred with <u>Zoologist of the Year Award</u> by the Zoological Society of Pakistan (ZSP).
August 2000	Conferred with the Civil Award (a Presidential Award given by the Government of Pakistan) <u>Sitara-i-Imtiaz</u> in recognition of services in the field of Chemistry.
December 2000	Elected to the Fellowship of the Islamic World Academy of Sciences (IAS), Amman, Jordan.
January 2001	Appointed Adjunct Professor, Postgraduate Institute of Biomedical Sciences, The University of Lahore.
October 2005	Bestowed upon the title of Distinguished National Professor by Higher Education Commission
September 2007	Awarded Prize and Gold Medal for Distinguished Scientist of the Year (2007) by Pakistan Academy of Sciences (PAS) in the field of Biochemistry in recognition of services/research work/contributions in the subject.

RESEARCH & PROFESSIONAL EXPERIENCE:

- August 2004 – to date *Senior Professor of Biochemistry*
Dr. Panjwani Centre for Molecular Medicine & Drug
Research (PCMD)
International Centre for Chemical and Biological Sciences
(ICCBS)
University of Karachi, Karachi-75270
- July 2002 –August 2004 *Director of Research & Professor of Cell Biology,*
Sindh Institute of Urology and Transplantation, Dow Medical
College and Civil Hospital, Baba-e-Urdu Road, Karachi-
Pakistan
- April 2002 – July 2002 *Professor of Biochemistry and Professor of Medical*
Education, Department of Basic Health Sciences, Shifa
College of Medicine, Pitras Bukhari Road, Sector: H-8/4
Islamabad, Pakistan.
- April 2001 – April 2002 *Professor of Biochemistry,* Department of Biological and
Biomedical Sciences, The Aga Khan University, Stadium
Road, P.O. Box 3500, Karachi –74800, Pakistan
- May 1986 – April 2001 *Professor & Chairman,* Department of Biochemistry, The
Aga Khan University P.O. Box 3500, Stadium Road, Karachi-
74800, Pakistan.
- 1980 - April 1986 *Cancer Research Scientist III,* November 1980, Department
of Cell and Tumor Biology, Roswell Park Memorial Institute,
Buffalo, New York, U.S.A.
- 1978 - 1980 *Cancer Research Scientist II,* May 1978. Department of Cell
and Tumor Biology (formerly Viral Oncology), Roswell Park
Memorial Institute, Buffalo, New York, U.S.A.
- 1976 - 1978 *Cancer Research Scientist I,* February 1976, Department of
Medical Viral Oncology, Roswell Park Memorial Institute,
Buffalo, New York, U.S.A.
- 1972 - 1976 *Postdoctoral Fellow,* April 1972. Department of Biology,
MIT, Cambridge, Massachusetts, in Dr. Joel A. Huberman's
laboratory. I carried out research on the topology and
biochemistry of DNA replication in eukaryotes.
- 1969 - 1972 *Graduate Student* at the Flinders University of South
Australia, Bedford Park, South Australia, 5042 Australia,
April 1969, in the laboratory of the late Professor M.R.
Atkinson, and Leigh A. Burgoyne. I received the Ph.D.
degree in April 1972, from the Biochemistry Division, School
of Biological Sciences. The title of my thesis was: *DNA
Synthesis in Mammalian Nuclei.*

1967 - 1969 *Assistant Scientific Officer* in the Pakistan Atomic Energy Commission, Lahore, Pakistan. My field of concentration was research on RNA repair in RNA containing bacteriophages, and I was collaborating with Dr. Amir Muhammad.

1965 - 1967 *Senior Research Fellow* at the Pakistan Council of Scientific and Industrial Research, Lahore, Pakistan. My research there was on amino acids biochemistry, and my advisor was Dr. Muhammad Saeed.

ASSOCIATIONS WITH PROFESSIONAL ORGANIZATIONS:

- The Biochemical Society, London	Emeritus Membership
- Medical Research Society of Pakistan	Member
- Pakistan Biological Sciences Society	“
- Pakistan Genetics Society	”
- Association for History and Philosophy of Science	”

RESEARCH INTEREST:

Elucidation of free radical scavengers in animal model

Role of urinary modulators in renal calculi formation

DNA Structures and functions

Allergies, asthma, and inhalant allergens

ADMINISTRATIVE RESPONSIBILITIES:

***Dr. Panjwani Centre for Molecular Medicine and Drug Research (PCMD),
International Centre for Chemical and Biological Sciences (ICCBS),
Karachi University,
Karachi***

Convener

- Board of Studies Sub Committee to prepare course contents, PCMD (2005)
- Committee for Prequalification of Printers, ICCBS (2005)
- Committee for the Diagnostic and Clinical Research Facility at PCMD (2005)
- Course Coordinator, PCMD
- Committee on the acquisition of fluorescence microcopy imaging facility, 10/2005
- Committee suggesting a suitable place for the construction of a record room 10/2005
- Search Committee to recruit Medical Officer in ICCBS, 03/2007.

Member

- Management Committee, PCMD (2004)
- Board of Studies, PCMD (2004)
- Infrastructure Management Committee, ICCBS (2004)
- Ethical committee for Radioactive use and Disposal, ICCBS (2005)
- Committee for Prequalification of Printers, ICCBS
- Interview panels for the Recruitment of Diagnostic and Clinical Research Facility staff, temporary posts (Project based) of Managerial/ Research and Project Director, Manager LAN/ Digital Library and network attendant of ICCBS, 07-09/2005
- To resolve the pending matters of Diagnostic Laboratory in Dr. Panjwani Center for Molecular Medicine and Drug Research 01/2006.
- Committee to review existing Courses and propose the revised contents in Biochemistry of HEJ Research Institute of Chemistry, 11/2005
- Committee to recommend Teaching Methods and Examination Systems to encourage enquiry – based learning and evaluation of conceptual understanding of students at HEJ Research Institute of Chemistry, 11/2005
- Ethical committee for the use of animals and biological samples, 08/2005
- Committee to critically evaluate/ review the research projects, 11/2005

- Committee for implementation of the safety measures at ICCBS, 11/2005
- Interview panel for the recruitment of staff for the Diagnostic lab. and Research Facility at PCMD, 07/2005
- Interview panel for recruitment of students on the grant of Dr. Kamran Azeem, 07/2005.
- Interview panel for the recruitment of future faculty members of PCMD, 10/2005
- Interview panel for the admission of short listed candidates for PCMD and HEJ Research Institute of Chemistry, 10/2005
- Committee to locate a suitable place for the incinerator.
- Committee for the preparation of Organogram of the ICCBS.
- Committee for the preparation of a proposal for M.Phil./Ph.D. program in Molecular Medicine at PCMD, University of Karachi.
- To finalize and select the questions for the admission test to enroll candidates in M.Phil./Ph.D. program in Molecular Medicine at PCMD, University of Karachi, 12/2005.
- Committee to investigate the alleged negligence of Srurgeon Tajwar, Ibn-e-Sina hospital, 07/2006.
- Committee to review the progress reports received from PCMD staff on training in Germany, 04/2007.

***Shifa College of Medicine
Islamabad***

Member

- Dean's Forum (2002)
- Academic Council (2002)
- Medical Education Group (2002)
- Attendance Criteria for Eligibility of Students to appear in the Professional Examination (2002)
- Clinical Rotations for Five Years (2002)

Appointed by the Dean to serve as a committee of one, to review and build a strategy based on the interviews with the students who performed poorly in the Term (X) Class of 2003 (2002).

ADMINISTRATIVE RESPONSIBILITIES: (Aga Khan University)

WORKED AS:

- *Chairman*, Ad-hoc Search Committee for Microbiology Chair.
- *Chairman*, Ad hoc Committee to hold Grand Seminar at 1993 Convocation (1993)
- *Chairman*, Ad hoc Immunology and Molecular Genetics Course Committee (1993)
- *Chairman*, Scientific Events Committee (1993-1994)
- *Chairman*, Admission Selection Committee for the Class of 1995.
- *Chairman*, Committee to Streamline Job Classification and Salary Levels for Technologists of Medical College.
- *Chairman*, Young Scientists Award Committee, to give travel awards for the Third National AKU Symposium (1996).
- *Chairman*, Poster Review Committee to give awards to the best posters presented in the Third National AKU Symposium (1996).
- *Convenor*, Scientific Programme Sub-Committee for Graduation for the Class of 1988.
- *Vice-Chairman*, Research Committee (1987-1992)
- *Convenor*, Question Review Committee for Basic Health Sciences, 1995 - 1996.
- *Chairman*, Young Scientists Award Committee, to give travel awards for the Fourth National AKU Symposium (1997)
- *Chairman*, Poster Review Committee to give awards to the best posters presented in the Fourth National AKU Symposium (1997)
- *Co-Chairman*, Scientific Committee of the 7th AKU National Symposium, 2001
- *Chairman*, Hospitality Committee of 7th AKU National Symposium, 2001
- *Convenor* , Sub-Committee (Introductory Block – Introduction to the Cell Biology) for the 1st two years of the of the PBL curriculum to develop a problem on Muscular spherocytosis, 2001.

SERVED AS MEMBER:

- Search Committee for Associate Dean and Director of The Aga Khan University School of Nursing (1988-1990)
- Acting Rector/Dean's Search Committee
- Task Force on Measures to Reduce Student Stress Committee
- Ad-hoc Committee on Dual Track for Clinical Faculty
- Graduate Studies Committee

- Committee of Academic Pathway for Instructors with Clinical Qualifications in Basic Sciences Department
- Interview Panel (1986-2002)
- Curriculum Committee (1986-1989)
- Committee for Recommendations on End of Term and Professional Examinations
- Research Laboratory Space Committee
- Planning Committee for the First Medical College Graduation
- Graduate Degree Course Ad-hoc Committee
- Review Group for the Operations of the materials Management Division
- Steering Committee (Degree Programme for the School of Nursing)
- The Committee to Plan a Tutorial for Junior Faculty in Teaching Techniques, Preparation of Audio-Visuals, etc.
- Basic Health Sciences Curriculum Sub-Committee
- Ad-hoc Committee to recommend name of Degree to be conferred on SON degree Graduate
- Ad-hoc Curriculum Committee
- Ad-hoc Committee to Review the policies in the Medical College for the Fee Structure for Students and for the Provision of Financial Assistance - Analysis, Comments and Recommendations for Board of Trustees, 1991
- Research Review Sub-Committee (1987-1988)
- Admissions Selection Committee for the Classes of 1993, 1994 and 1996
- Admissions Selection Committee (Leadership Development Programme) - Class of 1997
- Admission Advisory Group Committee
- AKU Academic Regalia for Graduation Committee (1988-1992)
- Code of Behaviour for Medical Students Committee (1987-1992)
- Committee to hold Grand Seminar at 1994 Convocation
- Faculty Executive Committee (1986-1996)
- Board of Graduate Studies (1991-1994)
- Search Committee for Paediatrics Chair (1994-1995)
- Poster Review Committee to give awards to the 3 best posters presented in the Second National Symposium (1995)
- Search Committee for Physiology/Pharmacology Chair (1995-1996)
- Examination and Promotion Committee (1996-2002)
- Steering Committee on Celebration of First Decade of the Medical Centre (1993)
- Strategic Planning Committee on the Graduate Program
- Medical College Faculty Council (1996 - 2002)
- Multi User Committee to oversee and make recommendations regarding multi use laboratory space and equipment in all areas of the University Campus (1996 - 2002)
- Organizing Committee, Third National AKU Symposium (1996)
- Scientific Committee, Third National AKU Symposium (1996)
- Poster Review Committee, Third National AKU Symposium, to recommend for awards to the best posters presented in the Symposium as part of the Infection Control Day Programme at the AKU (1996)
- Scientific Committee, Fourth National AKU Symposium (1997)

- The Ad-hoc Review Committee to Review Terms I to VI and the Integrated Module of Phase I of the undergraduate Medical Curriculum (1998-)
- Search Committee for Manager Warehouse and Distribution (1998)
- Staffing Sub-Committee of the Faculty of Health Sciences-Budget Advisory Committee 1998....
- Basic Sciences Working Group, 1999-2000.
- Focus Group (Research into Spending Patterns of Faculty Members, 2000)
- Organizing Committee for the 7th AKU National Symposium, 2001
- Block Sub-Committee (Neoplasia and Multi system Module) of the PBL curriculum, 2001
- Block Sub Committee (Introductory Block-Introduction to the Cell Biology) for the 1st two years of the new curriculum (PBL), 2001.
 - Block Sub-Committee of the Introductory Block- Introduction to the Cell Biology of the PBL curriculum to develop a problem on Down's Syndrome, 2001
- Course Coordinator, Term II, Class of 2006
- Search Committee, Department of Biological & Biomedical Sciences, 2001

Appointed by the Dean to serve as a committee of one, to review and build a strategy based on the Leadership Development Programme: its problems, successes, failures, resources and opportunities.

Appointed by the Dean to serve as University Marshal, Faculty of Health Sciences (1992-1994).

NATIONAL & INTERNATIONAL RECOGNITION

MEMBER:

- Selection Board, Institute of Biochemistry, University of Balochistan, Quetta.
- Board of Studies, Institute of Biochemistry, University of Balochistan, Quetta.
- Technical Committee in Biological Sciences, National Scientific Research and Development Board (NSRDB), University Grants Commission (UGC), Islamabad.
- Nutrition Advisory Committee, Palm Oil Research Institute of Malaysia (PORIM), Kuala Lumpur, Malaysia 1989-1996.
- Nutrition Advisory Committee-South Asia, Palm Oil Research Institute of Malaysia (PORIM), Kuala Lumpur, Malaysia, 1997-2001.
- Sub-Group of Technical Committee in Biological Sciences, National Scientific Research and Development Board (NSRDB), University Grants Commission (UGC), Islamabad.
- Pakistan Universities Coordination Council (PUCC), University Grants Commission (UGC), Islamabad.
- Board of Studies, Department of Genetics, University of Karachi, Karachi.
- Editorial Board, Journal of the Pakistan Council of Scientific and Industrial Research, since December 1991.
- Board of Trustees, Pakistan Academy of Medical Sciences (PAMS), July 1993.
- Advisory Committee of BCCI Fast Chair in Microbiology/Molecular Genetics/Molecular Biology/Genetic Engineering, University of Karachi, 1993
- Academic Council, Hamdard University, Karachi, 1995 -todate.
- Board of Studies, Department of Biochemistry, University of Karachi, Karachi, 1995
- Selection Board, Department of Genetics, University of Karachi, Karachi, 1995-1998
- Executive Board, Hamdard College of Eastern Medicine, Karachi, 1997-1998
- Life Scientists Group, Ministry of Science and Technology, Government of Pakistan to Explore Avenues for Advancement of Studies and Research in their Respective Fields, 1996-todate.
- Group for the Development of National Biotechnology Policy and Plan of Action, Ministry of Science and Technology, Government of Pakistan, 1997
- Permanent Committee for Scientific Promotion, Department of Scientific Council Affairs, King Abdulaziz University, Jeddah, Ministry of Higher Education, Kingdom of Saudi Arabia, 2001

MEMBER & EXPERT:

- Basic Sciences Sector selected by the Cabinet Committee to Review the Working of R&D Organizations, 1993
- National Scientific Research and Development Board (NSRDB). 1993
- Advisory Committee for National Institute of Biotechnology and Genetic Engineering (NIBGE), Pakistan Atomic Energy Commission. 1996.
- Review Committee for the National Centre of Excellence in Molecular Biology, University of the Punjab, Lahore, 1998
- Technical Committee to review grant applications submitted to Pakistan Science Foundation for funding, 1999
- Pakistan Science Foundation (PSF) Expert Panel for Evaluation of the National Commission for Science and Technology (NCST) Projects

Convener of the Pakistan Medical Research Council's Expert Panel of Molecular Biology/Genetics June 2007-May 2010.

Member of the Councils Technical Advisory Committee (TAC)Appointed by Board of Governors of the Pakistan Medical Research Council (PMRC), June 2009 to May 2010.

SERVED AS MEMBER ON:

- The Panel of Experts from Germany, Sri Lanka, Thailand, Nepal, India and Pakistan to give the report with recommendations on the feasibility of introducing Biotechnology to the School's curriculum in Sri Lanka held in December, 1991. This workshop was organized by the Institute of Fundamental Studies (IFS), Sri Lanka, and sponsored by United Nations Educational, Social and Cultural Organization (UNESCO).
- National Steering Committee, Ministry of Science and Technology, Government of Pakistan, in the field of Life Sciences to monitor new developments in this area on constant basis at National and International level and recommend appropriate measures for the benefit of the Country in the future 1996

Executive Member:

- Pakistan Genetics Society, 1996

General Secretary:

- Promotion of Education in Pakistan Foundation, Inc., New York, USA, 1995 - 1998

Vice President

- Promotion of Education in Pakistan Foundation, Inc., New York, USA, 1998 - 2000

REVIEW PANEL SERVICES:**RESEARCH GRANTS**

- Higher Education Commission
- Islamic Development Bank (IDB Young Researchers Support Program) (2002 – to date)

- Research & Development / Technology Development Research Projects (Ministry of Science & Technology) (2002 – to date)
- Monitoring & Evaluation of Institutional up gradation projects (Ministry of Science & Technology) (2002 – to date)
- PTCL Research & Development Fund (2002 - to date)
- Pakistan Science Foundation
- Center for Special Studies and Programs (CSSP), Bibliotheca Alexandria, Egypt
- Pak-US S&T Co-op Program under Pakistan Council for Science and Technology (PCST)

SCIENTIFIC JOURNALS

- Pakistan Journal of Scientific and Industrial Research
- Journal of the College of Physicians & Surgeons of Pakistan (JCPSP)
- Journal of the Chemical Society of Pakistan
- Pakistan Journal of Medical Sciences
- Proceedings of the Pakistan Academy of Sciences
- Parlar Scientific Publications (PSP), Fresenius Environmental Bulletin, Germany
- Journal of Cellular Biochemistry

LIST OF Publications:

1. Burgoyne, L.A., Waqar, M.A. and Atkinson, M.R. Calcium-Dependent Priming of DNA Synthesis in Isolated Rat Liver Nuclei. *Biochem. Biophys. Res. Commun.* 39, 254-259, 1970.
2. Burgoyne, L.A., Waqar, M.A. and Atkinson, M.R. Initiation of DNA Synthesis in Rat Thymus: Correlation of Calcium-Dependent Initiation in Thymocytes and in Isolated Thymus Nuclei. *Biochem. Biophys. Res. Commun.* 39, 918-922, 1970.
3. Waqar, M.A., Burgoyne, L.A. and Atkinson, M.R. Deoxyribonucleic Acid Synthesis in Mammalian Nuclei: Incorporation of Deoxyribonucleotides and Chain-Terminating Nucleotide Analogues. *Biochem. J.* 121, 803-809, 1971.
4. Waqar, M.A. and Burgoyne, L.A. DNA Synthesis in Mammalian Nuclei: Inhibition of DNA Synthesis in the Resting Rat Liver Nucleus by Ethidium Bromide, Proflavin and Actinomycin D. *Biochem. Biophys. Res. Commun.* 43, 1024-1028, 1971.
5. Waqar, M.A. and Huberman, J.A. Evidence for the Attachment of RNA to Pulse-Labeled DNA in the Slime Mold, *Physarum polycephalum*. *Biochem. Biophys. Res. Commun.* 51, 174-180, 1973.
6. Waqar, M.A. and Huberman, J.A. Nucleotide Sequences at the Junction Between RNA and Nascent DNA in the Slime Mold, *Physarum polycephalum*. *Fed. Am. Soc. Exp. Biol.* 33, 1352, 1974.
7. Waqar, M.A. and Huberman, J.A. Covalent Linkage Between RNA and Nascent DNA in the Slime Mold, *Physarum polycephalum*. *Biochem. Biophys. Acta* 383, 410-420, 1975.
8. Waqar, M.A. and Huberman, J.A. Covalent Attachment of RNA to Nascent DNA in Mammalian Cells. *Cell* 6, 551-557, 1975.
9. Waqar, M.A., Minkoff, R., Tsai, A. and Huberman, J.A. Evidence for RNA linked to Nascent DNA in Eukaryotic Organisms. In: *DNA Synthesis and Its Regulation*, eds. M.M. Goulian, P.C. Hanawalt and C.F. Fox, W.A. Benjamin, Inc. Menlo Park, California. *ICN-UCLA Symp. Molec. Cell. Biol.* 3, 334-356, 1975.
10. Edenberg, H.J., Waqar, M.A. and Huberman, J.A. Subnuclear Systems for *in vitro* SV40 DNA Synthesis. *Proc. Natl. Acad. Sci. U.S.A.* 73, 4392-4396, 1976.
11. Edenberg, H.J., Waqar, M.A. and Huberman, J.A. DNA Synthesis by Partially Purified Replicating Simian Virus 40 Chromosomes. *Nucleic Acids Res.* 4, 3083-3095, 1977.
12. Waqar, M.A., Huberman, J.A. and Evans, M.J. DNA Polymerases Bound to Replicating SV40 Chromosomes. *Fed. Am. Soc. Exp. Biol.* 36, 654, 1977.

14. Waqar, M.A. and Huberman, J.A. Studies on Replicating Simian Virus 40 Chromosomes: Association with Thymidine Kinase. In: *DNA Synthesis; Present and Future*, eds., M. Kohiyama and I. Molineux, Plenum Press, New York and London. *NATO Advanced Study Institutes Series* 17, 1093-1110, 1977.
15. Tsubota, Y., Waqar, M.A., Burke, J.P., Milavetz, B.I., Evans, M.J., Kowalski, D. and Huberman, J.A. Association of Enzymes with Replicating and Nonreplicating Simian Virus 40 Chromosomes. In: *DNA Replication and Recombination. Cold Spring Harbor Symposium Quant. Biol.* 43, 693-704, 1978.
16. Waqar, M.A., Tsubota, Y., Burke, J., Milavetz, B.I., Plummer, M.J., Evans, M.J. and Huberman, J.A. Resistance of *in vitro* Mammalian DNA Replication and of Purified DNA Polymerase α to 2',3'-Dideoxy-TTP. *Fed. Am. Soc. Exp. Biol.* 37, 1409, 1978.
17. Waqar, M.A. Evans, M.J. and Huberman, J.A. Effects of 2',3'-Dideoxythymidine-5'-Triphosphate on HeLa Cells *in vitro* DNA Synthesis: Evidence that DNA Polymerase α is the Only Polymerase Required for Cellular DNA Replication. *Nucleic Acids Res.* 5, 1933-1946, 1978.
18. Tsubota, Y., Waqar, M.A., Spotila, L., Kowalski, D., Eddy, M.J. and Evans, M.J. Association of DNA Polymerase α with Highly Purified Replicating Simian Virus 40 (SV40) Chromosomes. *Fed. Am. Soc. Exp. Biol.* 37, 1603, 1978.
19. Waqar, M.A., Taber, R.L. and Huberman, J.A. Studies on the Penetration of Mammalian Cells by Deoxyribonucleoside-5'-Phosphates. *J. Cell. Physiol.* 101, 251-259, 1979.
20. Evans, M.J., Waqar, M.A., Tsubota, Y., Milavetz, B.I., Burke, J. and Huberman, J.A. The Effect of Polymerase α Deletion *In vitro* DNA Synthesis by Replicating SV40 Chromosomes. *Fed. Am. Soc. Exp. Biol.* 38, 488, 1979.
21. Waqar, M.A., Evans, M.J. and Huberman, J.A. Processive DNA Synthesis by Partially Purified Replicating SV40 Chromosomes. *Fed. Am. Soc. Exp. Biol.* 39, 1959, 1980.
22. Waqar, M.A. Soltyk, A., Plummer, J., Evans, M.J. and Huberman, J.A. Aphidicolin-Resistant DNA Synthesis by DNA Polymerase α on Partially Purified Replicating SV40 Chromosomes. *Fed. Am. Soc. Exp. Biol.* 40, 1904, 1981.
23. Tsubota, Y., Waqar, M.A., Davis, L.R., Spotila, L. and Huberman, J.A. Both Parental DNA Strands at Each Replication Fork of Replicating Simian Virus 40 Chromosomes are cut by a Single-Strand-Specific Endonuclease. *Biochemistry* 21, 2713-2718, 1982.
24. Waqar, M.A., Evans, M.J., Burke, J.F., Tsubota, Y. Plummer, M.J. and Huberman, J.A. *in vitro* DNA Synthesis by an α -Like DNA Polymerase Bound to Replicating Simian Virus 40 Chromosomes. *J. Virol.* 48, 304-308, 1983.
25. Waqar, M.A., Evans, M.J., Manly, K.F., Hughes, R.G. and Huberman, J.A. Effects of 2',3'-Dideoxynucleosides on Mammalian Cells and Viruses. *J. Cell. Physiol.* 121, 402-408, 1984.

26. Waqar, M.A., Chung, S.D., Hiller, S. and Taub, M. Hormonally Defined Medium Permits an Analysis of Phosphate Transport by Primary Kidney Cultures. *Fed. Am. Soc. Exp. Biol.* 43, 2054, 1984.
27. Waqar, M.A., Seto, J., Chung, S.D., Hiller-Grohol, S. and Taub, M. Phosphate Uptake by Primary Renal Proximal Tubule Cell Cultures Grown in Hormonally Defined Medium. *J. Cell. Physiol.* 124, 411-423, 1985.
28. Waqar, M.A., Seto, J., Chung, S.D. and Taub, M. Phosphate Transport in Renal Proximal Cells Cultured in Defined Medium. *International Symposium on Growth and Differentiation of Cells in Defined Environment*, held in Fukuko, Japan, Eds., H. Murakami, I. Yamane, D.W. Barnes, J.P. Mather, I. Hayashi and G.H. Sato; Kodansha, Tokyo and Springer-Verlag; Berlin, Heidelberg, New York, Tokyo, pp.449-454, 1985.
29. Iqbal, M.P. and Waqar, M.A. Heterogeneity of Methotrexate Binding in Mammalian Liver. *Biochem. Soc. Trans.*, 15, 666-667, 1987.
30. Siddiqui, A.A., Mehboobali, N., Zulfiqarali, T., Khurshid, M. and Waqar, M.A.. Ultrathinlayer SDS-Polyacrylamide Gradient Gel Electrophoresis of Cerebrospinal Fluid (CSF) Proteins. *Biochem. Soc. Trans.*, 15,: 1111-1113, 1987.
31. Waqar, M.A. *In vitro* DNA Replication by Partially Purified Replicating Simian Virus Chromosomes. *Annals of Jinnah Postgraduate Medical Centre*, 4, 54, 1987.
32. Waqar, M.A. Simian Virus 40 DNA Replication *in vitro*. *Biochem. Soc. Trans.*, 16, 545-546, 1988.
33. Waqar, M.A. Separation of Replicating Simian Virus 40 Chromosomes According to Extend of Replication. *Biochem. Soc. Trans.*, 16, 546-547, 1988.
34. Waqar, M.A. Replicating Simian Virus 40 Chromosomes Structure. *Biochem. Soc. Trans.*, 16, 604-605, 1988.
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