

Stanford



Teresa Wang

Klaus Bensch Professor in Experimental Pathology, Emerita

 Curriculum Vitae available Online

CONTACT INFORMATION

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Bio

ACADEMIC APPOINTMENTS

- Emeritus Faculty, Acad Council, Pathology
- Member, Stanford Cancer Institute

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our major focus is to understand the molecular mechanisms involved in maintaining genome integrity during chromosome replication. Our current research programs are:

(1). We investigate what types of mutation in genes that play a critical role in DNA replication can cause an early event in tumorigenesis and are a source of the genetic instability observed in cancer cells. We use both budding and fission yeast as the model organisms to identify replication mutators. Similar and identical mutations are then introduced into homologous genes in human cell lines. We then investigate the physiological effects of the replication mutators on human cells by cytogenetic, cell biologic, and biochemical approaches to resolve the molecular mechanisms that cause the aberrant phenotype in human cells.

(2). We investigate how cells respond to replication stress to maintain genome integrity by checkpoint mechanisms. We used fission yeast as the model organism and replication mutants to induce stress in S-phase. We then investigate how the checkpoint mechanisms maintain genome integrity by inducing tolerance of the replication stress, preventing replication fork collapse, and promoting replication fork re-start. Knowledge gained from the fission yeast studies is then applied to investigate how mammalian cells respond to replication stress to maintain genome integrity.

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Cancer Biology (PhD Program)

Publications

PUBLICATIONS

- **Replication-compromised cells require the mitotic checkpoint to prevent tetraploidization** *CHROMOSOMA*
Zhang, Z., Arora, S., Zhou, y., Cherry, A., Wang, T. S.
2011; 120 (1): 73-82
- **Rad3-dependent phosphorylation of the checkpoint clamp regulates repair-pathway choice** *NATURE CELL BIOLOGY*
Kai, M., Furuya, K., Paderi, F., Carr, A. M., Wang, T. S.
2007; 9 (6): 691-U148
- **Rad4(TopBP1) associates with Srr2, an Spc1 MAPK-regulated protein, in response to environmental stress** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Taricani, L., Wang, T. S.
2007; 282 (12): 8793-8800
- **Rad4(TopBP1), a scaffold protein, plays separate roles in DNA damage and replication checkpoints and DNA replication** *MOLECULAR BIOLOGY OF THE CELL*
Taricani, L., Wang, T. S.
2006; 17 (8): 3456-3468
- **Methods for studying mutagenesis and checkpoints in *Schizosaccharomyces pombe*** *DNA REPAIR, PT B*
Kai, M., Taricani, L., Wang, T. S.
2006; 409: 183-194
- **Replication checkpoint kinase Cds1 regulates Mus81 to reserve genome integrity during replication stress** *GENES & DEVELOPMENT*
Kai, M., Boddy, M. N., Russell, P., Wang, T. S.
2005; 19 (8): 919-932
- **A coordinated temporal interplay of nucleosome reorganization factor, sister chromatin cohesion factor, and DNA polymerase alpha facilitates DNA replication** *MOLECULAR AND CELLULAR BIOLOGY*
Zhou, Y. J., Wang, T. S.
2004; 24 (21): 9568-9579
- **The B-subunit of DNA polymerase alpha-primase associates with the origin recognition complex for initiation of DNA replication** *MOLECULAR AND CELLULAR BIOLOGY*
Uchiyama, M., Wang, T. S.
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- **Checkpoint responses to replication stalling: inducing tolerance and preventing mutagenesis** *MUTATION RESEARCH-FUNDAMENTAL AND MOLECULAR MECHANISMS OF MUTAGENESIS*
Kai, M., Wang, T. S.
2003; 532 (1-2): 59-73
- **Genomic instability induced by mutations in *Saccharomyces cerevisiae* POL1** *GENETICS*
Gutierrez, P. J., Wang, T. S.
2003; 165 (1): 65-81
- **Replication proteins influence the maintenance of telomere length and telomerase protein stability** *MOLECULAR AND CELLULAR BIOLOGY*
Dahlen, M., Sunnerhagen, P., Wang, T. S.
2003; 23 (9): 3031-3042
- **Checkpoint activation regulates mutagenic translesion synthesis** *GENES & DEVELOPMENT*
Kai, M., Wang, T. S.
2003; 17 (1): 64-76
- **Fission yeast Rad17 associates with chromatin in response to aberrant genomic structures** *MOLECULAR AND CELLULAR BIOLOGY*
Kai, M., Tanaka, H., Wang, T. S.
2001; 21 (10): 3289-3301

- **Role of fission yeast primase catalytic subunit in the replication checkpoint** *MOLECULAR BIOLOGY OF THE CELL*
Griffiths, D. J., Liu, V. F., Nurse, P., Wang, T. S.
2001; 12 (1): 115-128
- **Analysis of fission yeast primase defines the checkpoint responses to aberrant S phase initiation** *MOLECULAR AND CELLULAR BIOLOGY*
Tan, S. Y., Wang, T. S.
2000; 20 (21): 7853-7866
- **A novel mutant allele of the chromatin-bound fission yeast checkpoint protein Rad17 separates the DNA structure checkpoints** *JOURNAL OF CELL SCIENCE*
Griffiths, D., Uchiyama, M., Nurse, P., Wang, T. S.
2000; 113 (6): 1075-1088
- **Schizosaccharomyces pombe replication and repair proteins: Proliferating cell nuclear antigen (PCNA)** *METHODS*
Arroyo, M. P., Wang, T. S.
1999; 18 (3): 335-348
- **Mutator phenotype induced by aberrant replication** *MOLECULAR AND CELLULAR BIOLOGY*
Liu, V. F., Bhaumik, D., Wang, T. S.
1999; 19 (2): 1126-1135
- **Human papillomavirus DNA replication - Interactions between the viral E1 protein and two subunits of human DNA polymerase alpha/primase** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Conger, K. L., Liu, J. S., KUO, S. R., CHOW, L. T., Wang, T. S.
1999; 274 (5): 2696-2705
- **Mutational effect of fission yeast Pol alpha on cell cycle events** *MOLECULAR BIOLOGY OF THE CELL*
Bhaumik, D., Wang, T. S.
1998; 9 (8): 2107-2123
- **Mutant PCNA alleles are associated with cdc phenotypes and sensitivity to DNA damage in fission yeast** *MOLECULAR AND GENERAL GENETICS*
Arroyo, M. P., Wang, T. S.
1998; 257 (5): 505-518
- **DNA replication and order of cell cycle events: A role for protein isoprenylation?** *BIOLOGICAL CHEMISTRY*
Galli, I., Uchiyama, M., Wang, T. S.
1997; 378 (9): 963-973
- **A novel mutant allele of Schizosaccharomyces pombe rad26 defective in monitoring S-phase progression to prevent premature mitosis** *MOLECULAR AND CELLULAR BIOLOGY*
Uchiyama, M., Galli, I., Griffiths, D. J., Wang, T. S.
1997; 17 (6): 3103-3115
- **Schizosaccharomyces pombe proliferating cell nuclear antigen mutations affect DNA polymerase delta processivity** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Arroyo, M. P., Downey, K. M., So, A. G., Wang, T. S.
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- **STUDIES OF SCHIZOSACCHAROMYCES-POMBE DNA-POLYMERASE-ALPHA AT DIFFERENT STAGES OF THE CELL-CYCLE** *NUCLEIC ACIDS RESEARCH*
Park, H., Davis, R., Wang, T. S.
1995; 23 (21): 4337-4344
- **MUTATIONAL STUDIES OF HUMAN DNA-POLYMERASE-ALPHA - LYSINE-950 IN THE 3RD MOST CONSERVED REGION OF ALPHA-LIKE DNA-POLYMERASES IS INVOLVED IN BINDING THE DEOXYNUCLEOSIDE TRIPHOSPHATE** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Dong, Q., Wang, T. S.
1995; 270 (37): 21563-21570
- **INTERACTION OF HERPES-SIMPLEX VIRUS-1 ORIGIN-BINDING PROTEIN WITH DNA-POLYMERASE-ALPHA** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Lee, S. S., Dong, Q., Wang, T. S., Lehman, I. R.

1995; 92 (17): 7882-7886

- **Purification of mammalian DNA polymerases: DNA polymerase alpha** *DNA REPLICATION*
Wang, T. S., Copeland, W. C., Rogge, L., Dong, Q.
1995; 262: 77-84
- **Rationale for mutagenesis of DNA polymerase active sites: DNA polymerase alpha** *DNA REPLICATION*
Copeland, W. C., Dong, Q., Wang, T. S.
1995; 262: 294-303
- **DOWN-REGULATION OF GENES ENCODING DNA-REPLICATION PROTEINS DURING CELL-CYCLE EXIT** *CELL GROWTH & DIFFERENTIATION*
Moore, A. L., Wang, T. S.
1994; 5 (5): 485-494
- **ENZYMATIC CHARACTERIZATION OF THE INDIVIDUAL MAMMALIAN PRIMASE SUBUNITS REVEALS A BIPHASIC MECHANISM FOR INITIATION OF DNA-REPLICATION** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Copeland, W. C., Wang, T. S.
1993; 268 (35): 26179-26189
- **MUTATIONAL STUDIES OF HUMAN DNA POLYMERASE-ALPHA - SERINE 867 IN THE 2ND MOST CONSERVED REGION AMONG ALPHA-LIKE DNA-POLYMERASES IS INVOLVED IN PRIMER BINDING AND MISPAIR PRIMER EXTENSION** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Dong, Q., Copeland, W. C., Wang, T. S.
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- **FISSION YEAST WITH DNA-POLYMERASE DELTA TEMPERATURE-SENSITIVE ALLELES EXHIBITS CELL-DIVISION CYCLE PHENOTYPE** *NUCLEIC ACIDS RESEARCH*
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- **FIDELITY STUDIES OF THE HUMAN DNA POLYMERASE-ALPHA - THE MOST CONSERVED REGION AMONG ALPHA-LIKE DNA-POLYMERASES IS RESPONSIBLE FOR METAL-INDUCED INFIDELITY IN DNA-SYNTHESIS** *JOURNAL OF BIOLOGICAL CHEMISTRY*
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- **MUTATIONAL ANALYSIS OF THE HUMAN DNA POLYMERASE-ALPHA - THE MOST CONSERVED REGION IN ALPHA-LIKE DNA-POLYMERASES IS INVOLVED IN METAL-SPECIFIC CATALYSIS** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Copeland, W. C., Wang, T. S.
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- **INITIATION OF SIMIAN VIRUS-40 DNA-REPLICATION REQUIRES THE INTERACTION OF A SPECIFIC DOMAIN OF HUMAN DNA POLYMERASE-ALPHA WITH LARGE T-ANTIGEN** *MOLECULAR AND CELLULAR BIOLOGY*
Dornreiter, I., Copeland, W. C., Wang, T. S.
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- **CELL-CYCLE EXPRESSION OF 2 REPLICATIVE DNA-POLYMERASES ALPHA AND DELTA FROM SCHIZOSACCHAROMYCES-POMBE** *MOLECULAR BIOLOGY OF THE CELL*
Park, H., Francesconi, S., Wang, T. S.
1993; 4 (2): 145-157
- **HUMAN DNA POLYMERASE-ALPHA AND POLYMERASE-BETA ARE ABLE TO INCORPORATE ANTI-HIV DEOXYNUCLEOTIDES INTO DNA** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Copeland, W. C., Chen, M. S., Wang, T. S.

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- **PROTEIN AFFINITY-CHROMATOGRAPHY REVEALS CELL-CYCLE DEPENDENT ASSOCIATION OF CELLULAR FACTORS WITH HUMAN DNA POLYMERASE-ALPHA** *CHROMOSOMA*
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Copeland, W. C., Wang, T. S.
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- **CELL CYCLE-DEPENDENT PHOSPHORYLATION OF HUMAN DNA POLYMERASE-ALPHA** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Nasheuer, H. P., Moore, A., Wahl, A. F., Wang, T. S.
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- **HUMAN DNA POLYMERASE-ALPHA GENE - SEQUENCES CONTROLLING EXPRESSION IN CYCLING AND SERUM-STIMULATED CELLS** *MOLECULAR AND CELLULAR BIOLOGY*
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- **HUMAN DNA-POLYMERASE ALPHA-GENE EXPRESSION IS CELL-PROLIFERATION DEPENDENT AND ITS PRIMARY STRUCTURE IS SIMILAR TO BOTH PROKARYOTIC AND EUKARYOTIC REPLICATIVE DNA-POLYMERASES** *EMBO JOURNAL*
Wong, S. W., Wahl, A. F., Yuan, P. M., Arai, N., Pearson, B. E., Arai, K., Korn, D., Hunkapiller, M. W., Wang, T. S.
1988; 7 (1): 37-47
- **SPECIFICITY OF THE CATALYTIC INTERACTION OF HUMAN DNA-POLYMERASE BETA WITH NUCLEIC-ACID SUBSTRATES** *BIOCHEMISTRY*
Wang, T. S., Korn, D.
1982; 21 (7): 1597-1608
- **REACTIVITY OF KB CELL DEOXYRIBONUCLEIC-ACID POLYMERASES-ALPHA AND POLYMERASES-BETA WITH NICKED AND GAPPED DEOXYRIBONUCLEIC-ACID** *BIOCHEMISTRY*
Wang, T. S., Korn, D.

