

Curriculum Vitae

DAVID JONATHAN BRENNER, Ph.D., D.Sc.

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Date of Birth: 9 June 1953.
Place of Birth: Liverpool, England
Nationality: British
Status: Permanent Resident of U.S.A.
Education: 1963-1970 Merchant Taylors' School, Liverpool, England.

1971-1974 Oxford University, St. Edmund Hall,
reading Physics and Philosophy.
Awarded Carter Physics Prize, 1974.
Degrees obtained: B.A., M.A.

1975-1976 Medical College of St. Bartholomew's Hospital,
University of London.
Degree obtained: M.Sc. in Radiation Physics (Distinction)

1976-1979 University of Surrey, Physics Department
Degree obtained: Ph.D.
Thesis Title: *Pion Interactions with Light Nuclei and
Applications to Radiotherapy*

APPOINTMENTS

2008- Higgins Professor of Radiation Biophysics and Director, Center for
Radiological Research, Columbia University Medical Center
1994- Professor of Radiation Oncology and Public Health, and Director,
Radiological Research Accelerator Facility, Center for Radiological
Research, Columbia University Medical Center.
1993-94 Tenured Associate Professor of Radiation Oncology and Public Health,
Center for Radiological Research, College of Physicians & Surgeons of
Columbia University.
1992-93 Associate Professor of Radiation Oncology (Tenure), Center for
Radiological Research, College of Physicians & Surgeons of Columbia
University.
1986-92 Assistant Professor of Radiation Oncology, College of Physicians &
Surgeons of Columbia University.
1983-86 Associate Research Scientist, Radiological Research Laboratory, College
of Physicians & Surgeons of Columbia University.
1981-83 Staff Member, Los Alamos National Laboratory.
1979-81 Postdoctoral Fellow, Los Alamos Scientific Laboratory.

AWARDS

University of California, Berkeley, Miller Professor (2002)
Honorary Degree (Doctor of Science), Oxford University, 1996.
Winner, 1992 National Council on Radiation Protection and Measurements, Robert D. Moseley Award for Radiation Protection in Medicine.
Winner, 1991 Radiation Research Society Annual Research Award.
Oxford University Carter Physics Prize, 1974

P.I. of NIH Grant “*Center for Minimally-Invasive High-Throughput Radiation Biodosimetry*” 2005-09
P.I. of NIH P41 grant “*Radiological Research Accelerator Facility*” 1996-2008
P.I. of NIH grant “*Cancer Risks Attributable to Radiation from Pediatric CT*” 2002-2007
P.I. of DOE grant “*A Validated High-LET-Radiation Specific Biomarker in the Mayak Worker Cohort*” 2001-2008
P.I. of DOE grant “*The Bystander Effect: Modeling, experiments, and More Modeling*” 2001-2007
P.I. of DOE grant: “*mFISH Measurements of Chromosomal Aberrations in Individuals Exposed In Utero to Low Doses of Gamma Rays*” 2002-2005
P.I. of Society of Pediatric Radiology grant: “*Credible risk estimates for pediatric CT examinations*” 2001-2002
P.I. of NIH grant “*Clinical mammographic imaging and cancer risks*” 1998-2001
P.I. of DOE grant “*Genetic, cytogenetic and oncogenic effects of low doses of low-energy (< 50 keV) x rays, measured at the National Synchrotron Light Source*” 1998-2002
P.I. of NIH grant “*Chromosomal Fingerprints of Prior Exposure to Neutrons and Alpha Particles*”, 1996-2000
P.I. of NASA grant “*Dose Rate Effects with Fast Protons*”, 1992-1993.
P.I. of ACS Grant “*High vs Low Dose Rate for Cervical Carcinoma*”, 1991-1994.
P.I. of NIH grant “*Radon, Bronchial Morphometry and Occupational Health*”, 1991-1994
P.I. of NIH Grant “*Early Effects of Radiation-Induced Radicals*”, 1985-1989

MEMBERSHIPS and COMMITTEES

Director, Radiological Research Accelerator Facility, Columbia University
Member, National Council on Radiation Protection and Measurements (NCRP)
Member, National Academy of Sciences BEIR VI Committee , 1994-98
Member, National Council on Radiation Protection Committee 1-6, on Linearity of Dose Response, 1995-2000
Chairperson, Columbia University Radiation Safety Committees, 1992-
Editorial Board, Radiation and Environmental Biophysics, 2002-
Member EPA Science Advisory Sub-Committee on Radon Research, 1993-96 .
Associate Editor, International Journal of Radiation Biology, 1991-1996
Member, Columbia University Senate, 1985-1987.
Physics Councilor, Radiation Research Society Executive Council, 1993-1996.

TEACHING

Teacher, Columbia University School of Public Health *Core Course in Environmental Sciences*.
Teacher of *Radiobiology for Radiation Oncology/Radiology Residents* (Columbia-Presbyterian Medical Center).
Teacher of Columbia University School of Public Health course P6320, *Radon, Risk and Remedy*
Teacher of undergraduate course *Radiation and Life*. Columbia University, Dept. of Biology,

PATENTS

US Patent 5,818,054: *Substance Detection with Monoenergetic Neutrons* (with G. Randers-Pehrson)

BOOKS

"*Radon, Risk and Remedy*", D. J. Brenner (W. H. Freeman, New York, 1989).

"*Making the Radiotherapy Decision*", D. J. Brenner and E. J. Hall (Lowell House, 1996)

PEER-REVIEWED PAPERS

- 1.* Brenner, D. J. and Smith, F. A. *Dose and LET distributions due to neutrons and photons emitted from stopped negative pions*. Phys. Med. Biol., 22, 451-465 (1977).
- 2.* Brenner, D. J. and Reading, D. H. *A method for measuring neutron spectra in a stopping pion field*, Nucl. Instr. Meth., 153, 137-144 (1978).
3. Jackson, D. F. and Brenner, D. J. *Nuclear interactions for medical purposes*, Prog. Part. Nucl. Phys., 5, 143-204 (1981).
- 4.* Brenner, D. J. *Monte Carlo self-shielding corrections for use with neutron spectrum unfolding codes*, Nucl. Sci. Eng., 78, 175-177 (1981).
5. Zaider, M., Dicello, J. F., Brenner, D. J., Takai, M., Raju, M. R. and Howard, J. *Microdosimetry of range-modulated beams of heavy ions I. Determination of the yield of projectile fragments from microdosimetric spectra for neon beams*. Radiat. Res., 87, 511-520 (1981).
- 6.* Brenner, D. J., Dicello, J. F. and Zaider, M. *An interpretation of some biological results obtained in range-modulated negative pion beams*, Int. J. Radiat. Oncol. Biol. Phys., 8, 121-126 (1982).
- 7.* Brenner, D. J. *Calculation of ionization distributions in a tissue-equivalent cloud chamber gas mixture*. Radiat. Res., 89, 194-202 (1982).
8. Zaider, M., Brenner, D. J., Hanson, K. and Minerbo, G. N. *An algorithm for determining the proximity distribution from dose-averaged lineal energies*. Radiat. Res., 91, 95-103 (1982).
9. Zaider, M., Brenner, D. J. and Wilson, W. E. *The application of track calculations to radiobiology. I. Monte Carlo simulation of proton tracks*. Radiat. Res., 95, 231-247 (1983).
10. Atari, N., Malik, S. R., Brenner, D. J., Hilko, R. and Bradbury, J. N. *A lyoluminescent tissue-equivalent dosimeter for pion therapy beams*. Phys. Med. Biol., 28, 493-502 (1983).
- 11.* Brenner, D. J. and Zaider, M. *Soft x-rays as a tool to investigate radiation-sensitive sites in mammalian cells*. Proc. SPIE, 47, 172-179 (1983).
12. Goodhead, D. T. and Brenner, D. J. *Estimation of a single physical property of low LET radiations which correlates with their biological effect*. Phys. Med. Biol., 28, 485-492 (1983).
13. Subramanian, T. S., Romero, J. L., Brady, F. P., Watson, J. W., Fitzgerald, D. H., Garrett, R., Needham, G. A., Ullman, J. L., Zanelli, C. I., Brenner, D. J. and Prael, R. E. *Double differential inclusive hydrogen and helium spectra from neutron induced reactions on carbon at 27.4, 39.7, and 60.7 MeV*. Phys. Rev., C28, 521-528 (1983).
- 14.* Brenner, D. J. and Zaider, M. *The application of track calculations to radiobiology.-II. Calculations of microdosimetric quantities*. Radiat. Res., 98, 14-25 (1984).
15. Zaider, M. and Brenner, D. J. *The application of track calculations to radiobiology.--III. Analysis of the molecular beam experiment results*. Radiat. Res., 100, 213-221 (1984).

16. Zaider, M. and Brenner, D. J. *On the stochastic treatment of fast chemical reactions*. Radiat. Res., 100, 245-256 (1984).
- 17.* Brenner, D. J. and Prael, R. E. *The $C(n,n')3\alpha$ cross-Section up to 60 MeV*. Nucl. Sci. Eng., 88, 97-101 (1984).
- 18.* Brenner, D. J. *Neutron kerma values above 15 MeV calculated with a nuclear model applicable to light nuclei*. Phys. Med. Biol., 29, 437-441 (1984).
- 19.* Brenner, D. J. and Zaider, M. *A computationally convenient parameterisation of experimental angular distributions of low energy electrons elastically scattered off water vapour*. Phys. Med. Biol., 29, 443-447 (1984).
20. Zaider, M. and Brenner, D. J. *Comments on 'V79 Survival following simultaneous or sequential irradiation by 15-MeV neutrons and Co photons' by Higgins et al. [Radiat. Res. 95, 45-56(1983)]*. Radiat. Res., 99, 438-441 (1984).
21. Zaider, M. and Brenner, D. J. *Modification of the theory of dual radiation action for attenuated fields.--I. Basic formalism*. Radiat. Res., 99, 484-491 (1984)
- 22.* Brenner, D. J. and Zaider, M. *Modification of the theory of dual radiation action for attenuated fields.--II. Application to the analysis of soft x-ray results*. Radiat. Res. 99, 492-501 (1984).
23. Zaider, M. and Brenner, D. J. *On the microdosimetric definition of quality factors*. Radiat. Res., 103, 302-316 (1985).
- 24.* Brenner, D. J. and Zaider, M. *Stochastic and deterministic treatments of the time decay of species created by heavy-charged particle interactions*. Radiat. Prot. Dosimetry, 13, 127-131 (1985)
25. Hoshi, M., Goodhead, D. T., Brenner, D. J., Bance, D. A., Chmielewski, J. J., Paciotti, M. A. and Bradbury, J. N. *Dosimetry comparison and characterisation of an Al K ultrasoft X-ray beam from an MRC cold-cathode source*. Phys. Med. Biol., 30, 1029-1041 (1985).
26. Zaider, M. and Brenner, D. J. *Evaluation of a Specific Quality Function for mutation induction in human fibroblasts*. Rad. Prot. Dosim., 15, 79-82 (1986).
27. Subramanian, T. S., Romero, J. L., Brady, F. P., Watson, J. W., Fitzgerald, D. H., Garrett, R., Needham, G. A., Ullman, J. L., Zanelli, C. I., Brenner, D. J. and Prael, R. E. *Double differential inclusive hydrogen and helium spectra from neutron-induced reactions at 27.4, 39.7, and 60.7 MeV II. Oxygen and nitrogen*. Phys. Rev., C34, 1580-1586 (1986)
- 28.* Brenner, D. J., Zaider, M., Coyne, J. J., Menzel, H. G. and Prael, R. E. *The evaluation of non-elastic neutron cross-sections on carbon above 14 MeV*. Nucl. Sci. Eng. 95, 311-315 (1987)
- 29.* Brenner, D. J., Bird, R. P., Zaider, M., Goldhagen, P., Kliauga, P. J. and Rossi, H. H. *Inactivation of synchronized mammalian cells with low-energy X rays-- Results and significance*. Radiat. Res. 110, 413-427 (1987)
- 30.* Brenner, D. J., Geard, C. R., Zaider, M. and Georgsson, M. A. *Cell survival and plating efficiency*. Radiat. Res. 111, 572-576 (1987)
- 31.* Brenner, D. J. *Concerning the nature of the initial damage required for the production of radiation-induced exchange aberrations*. Int. J. Radiat. Biol. 52, 805-809 (1987).

32. Miller, R. C., Brenner, D. J., Geard, C. R., Komatsu, K., Marino, S. A., and Hall, E. J. *Oncogenic transformation by fractionated doses of neutrons*. Radiat. Res. 114, 589-598 (1988)
- 33.* Brenner, D. J. *On the probability of interaction between elementary radiation-induced chromosomal injuries*. Rad. Environ. Biophys. 27, 189-199 (1988)
- 34.* Brenner, D. J. *Stochastic calculations of the fast decay of the hydrated electron in the presence of scavengers -- Tests of model consistency*. Rad. Phys. Chem. 32, 157-162 (1988)
35. Zaider, M., Brenner, D. J., Hall, E. J. and Kliauga, P. J. *The link between physics and biology*. Am. J. Clin. Oncol. 11, 212-219 (1988).
36. Hei, T. K., Chen, D. J., Brenner, D. J. and Hall, E. J. *Mutation induction by charged particles of defined LET*. Carcinogenesis, 9, 1233-1236 (1988).
- 37.* Brenner, D. J. *Precision and accuracy in radiotherapy*. Radiotherapy & Oncology, 14 159-162 (1989)
38. Miller, R. C. , Geard, C. R., Brenner, D. J., Komatsu, K., Marino, S. A. and Hall, E. J. *Neutron-energy-dependent oncogenic transformation of C3H10T½ cells*. Radiat. Res., 117, 114-127 (1989)
- 39.* Brenner, D. J., *Comments on "It is Time to Reopen the Question of Thresholds in Radiation Exposure Responses" by J. R. Totter [Rad. Res. 114, 1-2 (1988)]*. Radiat. Res., 116, 172-174, (1988).
- 40.* Brenner, D. J. and Prael, R. E. *Calculated differential secondary-particle production cross sections after non-elastic neutron interactions with carbon and oxygen between 15 and 60 MeV*. Atomic Data Nucl. Data Tables, 41, 71-130 (1989)
- 41.* Brenner, D. J., *Appropriate uses of the proposed ICRU-40 quality factor, Q(y)*. J. Radiol. Prot. 9, 51-52 (1989)
42. Worgul, B. V., Merriam, G. R., Jr., Medvedovsky, C. and Brenner, D. J., *Accelerated heavy particles and the lens: III. Cataract enhancement by dose fractionation*. Rad. Res., 118, 93-100 (1989).
- 43.* Brenner, D. J. and Amols, H. I. *Enhanced risk from low-energy screen-film mammography X rays*. Brit. J. Radiol., 62, 910-914 (1989).
- 44.* Brenner, D. J. *The effectiveness of single alpha particles*. In Low Dose Radiation: Biological Bases of Risk Assessment (Ed. Lancashire, J.) pp 477-480, Taylor and Francis, London and New York (1989)
45. Hoshi, M. Yokoru, K., Sawada, S., Shizuma, K., Iwatani, K., Hasai, H. Oka, T., Morishima, H. and Brenner, D. J. *Europium-152 activity induced by Hiroshima atomic-bomb neutrons: Comparison with the ³²P, ⁶⁰Co and ¹⁵²Eu activities in Dosimetry System 1986 (DS86)*. Health Physics, 57, 831-837 (1989).
- 46.* Brenner, D. J., Geard, C. R. and Hall, E. J. *Mossbauer cancer therapy doubts*. Nature, 339, 185-186 (1989).
47. Hall, E. J., Brenner, D. J., Hei, T. and Miller, R. C. *The microdosimetric link between oncogenic transformation data with neutrons and with charged particles*. Radiat. Prot. Dosim., 31, 275-278 (1990).

48. Marchese M.J., Goldhagen, P.E., Zaider, M., Brenner, D.J. and Hall, E. J. *The relative biological effectiveness of encapsulated iodine-125 photon radiation in human cells. I. Normal diploid fibroblasts.* Int. J. Radiat. Oncol. Biol. Phys., 18, 1407-1413 (1990).
49. Marino, S. A., Harvey, J. R., Brenner, D. J. and Rossi, H. H. *Measurements of the distribution of the separations between paired ions after passing through mylar.* Radiat. Prot. Dosim., 31, 77-80 (1990).
- 50.* Brenner, D. J. and Quan, H. *Confidence limits for low induced frequencies of oncogenesis in the presence of a background.* Int. J. Radiat. Biol., 57, 1031-1046 (1990).
51. Geard, C. R. and Brenner, D. J. *Chromosomal changes per cell nucleus per charged particle.* Radiat. Prot. Dosim., 31, 285-290 (1990).
- 52.* Brenner, D. J. *The microdosimetry of radon daughters and its significance.* Radiat. Prot. Dosim., 31, 399-404 (1990).
- 53.* Brenner, D. J. and Hall, E. J., *The inverse dose-rate effect for oncogenic transformation by neutrons and charged particles: A plausible interpretation consistent with published data.* Int. J. Radiat. Biol., 58, 745-758 (1990).
54. Miller, R., Brenner, D. J., Randers-Pehrson, G., Marino, S.A. and Hall, E. J., *The Effects of the temporal distribution of dose on oncogenic transformation by neutrons and charged particles of intermediate LET.* Radiat. Res., 124, S62-68 (1990)
- 55.* Brenner, D. J. *Track structure, lesion development and cell survival.* Radiat. Res., 124, S29-37 (1990)
- 56.* Brenner, D. J. and Quan, H. *Exact confidence limits for binomial proportions - Pearson and Hartley revisited.* The Statistician, 39, 391-397 (1990).
- 57.* Brenner, D. J. *On the use of distributions of stopping pions as an indicator of the spatial distribution of the high-LET dose in negative pion radiotherapy.* Phys. Med. Biol., 35, 1585-1591 (1990).
58. Geard, C.R., Brenner, D. J., Randers-Pehrson, G. and Marino, S.A., *Single-particle irradiation of mammalian cells at the Radiological Research Accelerator Facility: induction of chromosomal changes.* Nucl. Instr. Meth., B54, 411-416 (1991).
- 59.* Brenner, D. J. and Hall, E. J., *Conditions for the equivalence of continuous to pulsed low dose rate brachytherapy.* Int. J. Radiat. Oncol. Biol. Phys., 20, 181-190 (1991).
- 60.* Brenner, D. J. *Significance of neutrons from the atomic bomb at Hiroshima for revised radiation risk estimates.* Health Physics, 60, 439-442 (1991).
- 61.* Brenner, D. J. and Hall, E. J. *Fractionated high dose rate versus low dose rate regimens for intracavitary brachytherapy of the cervix. I. General considerations based on radiobiology.* British Journal of Radiology, 64, 133-141 (1991).
- 62.* Brenner, D. J., Martel, M. K. and Hall, E. J. *Fractionated regimes for stereotactic radiotherapy of recurrent tumors in the brain.* International Journal of Radiation Oncology, Biology, Physics, 21, 819-824 (1991).
63. Hall, E. J., Miller, R. C. and Brenner, D. J. *Neoplastic transformation and the inverse dose rate effect for neutrons.* Radiat. Res., 127, S75-80 (1991).
64. Straume, T., McDonald, J. C., Pederson, R. A., Brenner, D. J. and Dobson, R.L., *Hiroshima-like neutrons from A-bomb replica: Physical basis for their use in biological experiments.* Radiation Research, 128, 133-142 (1991).

- 65.* Brenner, D. J., Medvedovsky, C., Huang, Y., Merriam, G. R., and Worgul, B. V. *Accelerated heavy particles and the lens VI. RBE studies at low doses.* Radiat. Res., 128, 73-81 (1991).
66. Hall, E. J. and Brenner, D. J., *The dose-rate effect revisited - Radiobiological considerations of importance in radiotherapy.* Int. J. Radiat. Oncol. Biol. Phys., 21, 1403-1413 (1991).
- 67.* Brenner, D. J. Huang, Y.P., and Hall, E. J., *Fractionated high dose-rate versus low dose-rate regimens for intracavitary brachytherapy of the cervix. II. Equivalent regimes for combined brachytherapy and external radiation.* Int. J. Radiat. Oncol. Biol. Phys., 21, 1415-1423 (1991).
68. Hall, E. J. Astor, M., and Brenner, D. J., *Biological intercomparison of neutron beams used for radiotherapy generated by p^+ -Be in hospital-based cyclotrons.* British Journal of Radiology, 65, 66-71 (1992).
- 69.* Brenner, D. J. *Radon - Current challenges in cellular radiobiology.* Int. J. Radiat. Biol., 61, 3-13 (1992)
70. Hall, E. J. and Brenner, D. J., *The dose rate effect in interstitial brachytherapy - A controversy resolved.* British Journal of Radiology, 65, 242-247 (1992).
- 71.* Brenner, D. J. and Hall, E. J., *Radiation-induced oncogenic transformation: the interplay between dose, dose protraction, and radiation quality.* Advan. Radiat. Biol., 16, 167-179 (1992).
- 72.* Brenner, D. J. and Ward, J. F., *Constraints on energy deposition and target size of multiply-damaged sites associated with DNA double-strand breaks.* International Journal of Radiation Biology, 61, 737-748 (1992).
73. Hall, E.J. and Brenner, D.J., *Needles, Wires and Chips - Advances in brachytherapy.* Clin. Oncol., 4, 249-256 (1992).
- 74.* Brenner, D. J. *Correlations between α/β and $T_{1/2}$: Implications for clinical biological modelling.* Brit. J. Radiol., 65, 1051-1054 (1992).
75. Hall, E. J. and Brenner, D. J., *The biological effectiveness of neutrons: Implications for radiation protection.* Radiat. Protec. Dosim., 44, 1-9 (1992).
- 76.* Brenner, D. J., Miller, R.C., Marino, S.A., Geard, C.R., Randers-Pehrson, G., and Hall, E. J. *Inverse dose rate effects for neutrons: General features and biophysical consequences.* Radiat. Protec. Dosim., 44, 45-48 (1992)
77. Worgul, B. V., Brenner, D. J., Medvedovsky, C., Merriam, G. R. Jr., and Huang, Y. *Accelerated heavy particles and the lens: VII The cataractogenic potential of 450 MeV/amu ^{56}Fe ions.* Invest. Ophthalm. Vis. Sci., 34, 184-193 (1993).
78. Hall, E. J. and Brenner, D. J., *The radiobiology of radiosurgery: Rationale for different treatment regimes for AVM's and malignancies.* Int. J. Radiat. Oncol. Biol. Phys., 25, 381-385 (1993).
- 79.* Brenner, D. J., Medvedovsky, C., Huang, Y., and Worgul, B. V. *Accelerated heavy particles and the lens VIII. Comparison between the effects of iron ions (190 keV/ μm) and argon ions (88 keV/ μm).* Radiation Research, 133, 198-203 (1993).
- 80.* Brenner, D. J. *Dose, volume and tumor-control predictions in radiotherapy.* Int. J. Radiat. Oncol. Biol. Phys., 26, 171-179 (1993).

- 81.* Brenner, D. J., Hall, E. J., Randers-Pehrson, G. and Miller, R. C. *Model considerations on the dose-rate/LET dependence of oncogenic transformation by charged particles*. Radiation Research, 133, 365-369 (1993).
- 82.* Brenner, D. J. *The Influence of Cell Killing on Radiation Oncogenesis: Possible Implications for High-LET Risk Assessment at Medium Doses*. Health Physics 65, 358-366 (1993).
83. Hahnfeldt, P., Hearst, J.E., Brenner, D.J., Sachs, R.K., and Hlatky, L.R., *Polymer models for interphase chromosomes*. Proc. Nat. Acad. Sci. USA 90, 7854-7858 (1993)
84. Sachs, R.K. and Brenner, D.J., *Effect of LET on chromosomal aberration yields. I. Do long-lived, exchange-prone double strand breaks play a role?* Int. J. Radiat. Biol. 64, 677-688 (1993).
- 85.* Brenner, D. J. *Accelerated Repopulation during Radiotherapy - Evidence for Delayed Onset*. Radiat. Oncol. Invest. 1, 167-172 (1993).
- 86.* Brenner, D. J. *The significance of dose rate in assessing the hazards of domestic radon exposure*. Health Physics 67, 76-79 (1994).
- 87.* Brenner, D.J. and Sachs, R.K., *Generalized Microdosimetric Calculations of Cell-to-Cell Variance*. Radiat. Protec. Dosim. 52, 21-24 (1994).
- 88.* Brenner, D.J. and Hall, E.J. *Stereotactic radiotherapy of intra-cranial tumors - an ideal candidate for accelerated treatment*. Int. J. Radiat. Oncol. Biol. Phys. 28, 1039-1042 (1994)
- 89.* Brenner, D. J.; Hall, E.J.; Huang, Y.-P.; Sachs, R.K. *Optimizing the time course of brachytherapy and other accelerated radiotherapeutic protocols*. Int. J. Radiat. Oncol. Biol. Phys. 29, 893-901 (1994).
90. Geard, C.R., Miller, R.C., Brenner, D.J. and Hall, E.J. *Oncogenic transformation through the cell cycle and the LET dependence of the inverse dose rate effect*. Radiat. Protec. Dosim. 52, 367-371 (1994).
- 91.* Brenner, D.J. and Merriam, G.R., Jr. *Postoperative irradiation for pterygium: guidelines for optimal treatment*. Int. J. Radiat. Oncol. Biol. Phys. 30, 721-725 (1994)
- 92.* Brenner, D. J. and Hall, R.C., *One, 10, 20 or 30 fractions in stereotactic radiotherapy for brain malignancies*. Int. J. Radiat. Oncol. Biol. Phys. 30, 501 (1994).
- 93.* Brenner, D. J. and Sachs R.K. *Chromosomal 'fingerprints' of prior exposure to densely-ionizing radiation*. Radiat. Res. 140, 134-142 (1994).
94. Medvedovsky, C., Worgul, B.V., Huang, Y., Brenner, D.J., Tao, F., Miller, J., Zeitlin, C., and Ainsworth, E.J. *The influence of dose, dose rate, and particle fragmentation on cataract induction by energetic iron ions*. Advan. Space. Res., 14, 475-82 (1994).
95. Hahnfeldt, P., Hlatky, L.R., Brenner, D.J. and Sachs, R.K. *Radiation-produced chromosome aberrations: The relation between excess acentric fragments and dicentrics*. Radiat. Res. 141, 136-152 (1995).
- 96.* Brenner, D.J., Hall, E.J., Huang, Y.-P., Sachs, R.P., *Potential reduced late effects for pulsed brachytherapy compared with conventional LDR*. Int. J. Radiat. Oncol. Biol. Phys. 31, 201-202 (1995)
- 97.* Brenner, D.J., Hlatky, L.R., Hahnfeldt, P.J., Hall, E.J. and Sachs, R.K. *A convenient extension of the linear-quadratic model to include redistribution and reoxygenation*. Int. J. Radiat. Oncol. Biol. Phys. 32, 379-390 (1995).

98. Chen, P.-L., Brenner, D.J. and Sachs, R.K., *Ionizing radiation damage to cells: Effects of cell cycle redistribution*. Math. Biosci. 26, 147-170 (1995).
99. Miller, R.C., S. A. Marino, D. J. Brenner, S. G. Martin, M. Richards, G. Randers-Pehrson and E. J. Hall, *The biological effectiveness of radon-progeny alpha particles II Neoplastic transformation as a function of LET*. Radiat. Res. 142, 54-60 (1995).
- 100.* Brenner, D.J., Miller, R.C., Huang, Y. and Hall, E.J. *The biological effectiveness of radon-progeny alpha particles III Quality factors*. Radiat. Res. 142, 61-69 (1995).
101. Chen, A.M., Lucas, J.N., Hill, F.S., Brenner, D.J., and Sachs, R.K., *Chromosome aberrations produced by ionizing radiation: Monte-Carlo simulations and chromosome painting data*. Comput. Applic. Biosci. 11, 389-97 (1995).
102. Miller, R.C., Richards, M., Brenner, D.J., Hall, E.J., Jostes, R., Hui, T.E. and Brooks, A.L., *The biological effectiveness of radon-progeny alpha particles V. Oncogenic transformation from monoenergetic accelerator-produced alpha particles compared with polyenergetic alpha particles from radon progeny*. Radiat. Res. 146, 75-80 (1996).
- 103.* Brenner, D.J., Hall, E.J., Randers-Pehrson, G., Huang, Y., Johnson, G.W., Miller, R.W., Wu, B., Vazquez, M.E., Medvedovsky, C. and Worgul, B.V. *Quantitative comparisons of continuous and pulsed low dose-rate regimens in a model late-effect system*. Int. J. Radiat. Oncol. Biol. Phys 34, 905-10 (1996).
104. Worgul, B.V., Medvedovsky, C., Huang, Y., Brenner, D.J., *Quantitative assessment of the cataractogenic potential of very low doses of neutrons*. Radiat. Res. 145, 343-49 (1996)
105. * Brenner, D.J. *Direct biological evidence for a significant neutron dose to survivors of the Hiroshima A Bomb*. Radiation Research 145, 501-507 (1996)
106. Hall, E. J. and Brenner, D. J. *Pulsed dose rate brachytherapy: Can we take advantage of new technology?* Int. J. Radiat. Oncol. Biol. Phys. 34, 511-512 (1996).
107. Chen, A.M., Lucas, J.N., Hill, F.S., Brenner, D.J., and Sachs, R.K. *Proximity effects for chromosome aberrations measured by FISH*. Int. J. Radiat. Biol. 69, 411-420 (1996)
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