

Curriculum Vitae for Gerhard Randers-Pehrson, PhD

- 1) CV prepared: March 23, 2006
- 2) Personal data:
 - a) Name: Gerhard Randers-Pehrson
 - b) Birthdate: April 13, 1944
 - c) Birthplace: Washington, D.C.
 - d) Citizenship: United States of America
- 3) Education:

1966; BS, Physics; Rensselaer Polytechnic Institute, Troy, New York
1979; PhD; Nuclear Physics; University of Maryland, College Park, Maryland
Thesis: Study of the $J^\pi = 3^+$ Doublet in Beryllium-8 at 19 MeV. Sponsored by Jerry B. Marion. Available from University Microfilms as document [7926535](#), but otherwise unpublished.
- 4) Postdoctoral Training:

1973-1976 Research Associate in trace element analysis using PIXEA, Virginia Associated Research Campus, College of William and Mary, Newport News, Virginia
1979-1982 Post Doctoral Research Associate in neutron physics, Physics Department, Ohio University, Athens, Ohio
- 5) Military service:

Army ROTC at Rensselaer, Commissioned as Second Lieutenant June, 1966
Honorably discharged from the Army Reserve in 1976 as a First Lieutenant
- 6) Professional organizations and societies:

Radiation Research Society
Board of Directors of the Hudson River Sloop Clearwater, a Hudson River environmental group.
- 7) Academic appointments:

1982-1997 Associate Research Scientist, Center for Radiological Research, College of Physicians & Surgeons, Columbia University, New York, NY
1997-2006 Research Scientist, Center for Radiological Research, College of Physicians & Surgeons, Columbia University, New York, NY
2006- Senior Research Scientist, Center for Radiological Research, College of Physicians & Surgeons, Columbia University, New York, NY
- 9) Honors:

Sigma Xi
- 12) Other professional activities:
 - a) Editorial Referee for Radiation Research
 - b) Consultative (Federal, State, Private, etc.) Served on two SBIR Radiation study panels for the NIH.
- 15) Publications: asterisk (*) marks publications for which the candidate is a senior author.

A. Original, Peer Reviewed Articles

1. Cooper MD, Figuera, AS, Pfeufer, G, Randers-Pehrson, G: Behavior of the cross section for the ${}^9\text{Be}(p,p){}^9\text{Be}$ reaction near the 2.06 MeV (p,n) threshold. Nuclear Physics A 1970;142a:445-448.
2. Jolly RK, Gupta, S.K., Buckle, D.C., Randers-Pehrson, G., and Aceto, H.Jr.: Linear Scans of Hair Strands for Trace Elements by Proton Induced X-Ray Emission. In Symposium on the Use of Small Accelerators in Teaching and Research Denton, Texas, 1975.
3. Jolly RK, Gupta, S.K., Buckle, D.C., Randers-Pehrson, G., Thornton, W.B., Aceto, H. Jr., Singh, J.J., and Woods: Preferential concentration of certain elements in smaller aerosols emitted from aircraft engines. Journal of Applied Physics 1975;46:4590-4594.
4. Jolly RK, Kane, JR, Buckle, DC, Randers-Pehrson, G, Teoh, W, Aceto, H, Jr.: A target chamber for PIXE analysis using microampere beams of 4 MeV protons. Nuclear Instruments and Methods 1978;151:183-188.
5. Kulkarni V, Grabmayr, P, Randers-Pehrson, G, Finlay, RW, Rapaport, J, Grimes, SM: Study of neutron-induced charged particle reactions on deuterium using a quadrupole triplet spectrometer. In International Conference on Nuclear Cross Sections for Technology. Knoxville, TN, USA, NBS, 1980:527-530.
6. Yamanouti Y, Rapaport, J, Grimes, SM, Kulkarni, V, Finlay, RW, Bainum, D, Grabmayr, P, Randers-Pehrson, G: Elastic and inelastic scattering of 24 MeV neutrons from even isotopes of Ni. In International Conference on Nuclear Cross Sections for Technology. Knoxville, TN, USA, NBS, 1980:146-149.
7. Kulkarni V, Rapaport, J, Finlay, RW, Randers-Pehrson, G, Koshel, RD: Differential cross-section measurements of the ${}^2\text{H}(n,p){}^2\text{n}$ and ${}^2\text{H}(n,d){}^3\text{n}$ reactions and the n-n scattering length. Nuclear Physics A 1981;A367:157-175.
- *8. Carter DE, Randers-Pehrson, G: A successive approximation analog to digital conversion system with good differential linearity. Nuclear Instruments and Methods in Physics Research 1982;199:497-503.
9. Finlay RW, Brient, CE, Carter, DE, Marcinkowski, A, Mellema, S, Randers-Pehrson, G, Rapaport, J: The Ohio University beam swinger facility. Nuclear Instruments and Methods in Physics Research 1982;198:197-206.
10. Grimes SM, Grabmayr, P, Finlay, RW, Graham, SL, Randers-Pehrson, G, Rapaport, J: A technique to correct for backgrounds caused by break-up neutrons from the D(d,n) reaction. Nuclear Instruments and Methods in Physics Research 1982;203:269-272.
11. Yiming Y, Brient, CE, Finlay, RW, Randers-Pehrson, G, Marcinkowski, A, Taylor, RC, Rapaport, J: Interaction of 11 MeV neutrons with ${}^{89}\text{Y}$. Nuclear Physics A 1982;A390:449-460.
12. Dietrich FS, Finlay, RW, Mellema, S, Randers-Pehrson, G, Petrovich, F: Isospin dependence of the microscopic optical model for nucleon scattering. Physical Review Letters 1983;51:1629-1632.
13. Marcinkowski A, Finlay, RW, Randers-Pehrson, G, Brient, CE, Kurup, R, Mellema, S, Meigooni, A, Taylor, R: Neutron emission cross sections at 25.7 MeV: ${}^{51}\text{V}$, ${}^{56}\text{Fe}$,

⁶⁵Cu, ⁹³Nb, and ²⁰⁹Bi. Nuclear Science and Engineering 1983;83:13-21.

14. Marcinkowski A, Finlay, RW, Randers-Pehrson, G, Brient, CE, O'Donnell, JE, Stankiewicz, K: Neutron emission spectra and angular distributions at 25.7 MeV neutron bombarding energies. Nuclear Physics A 1983;A402:220-234.
- *15. Randers-Pehrson G, Finlay, R.W., Dicello, J.F. and McDonald, J.C.: A technique for time-resolved microdosimetric spectroscopy. In Ebert JBaH (ed): 8th Symposium on Microdosimetry. Julich, W. Germany, Radiation Protection, 1983:1169-1177.
- *16. Randers-Pehrson G, Finlay, RW, Carter, DE: New style of photomultiplier tube voltage divider. Nuclear Instruments and Methods in Physics Research 1983;215:433-436.
17. Taylor RC, Rapaport, J, Finlay, RW, Randers-Pehrson, G: Neutron scattering from ²⁶Mg. Nuclear Physics A 1983;A401:237-252.
18. Ahmad M, Graham, SL, Grimes, SM, Longfellow, R, Satyanarayana, H, Randers-Pehrson, G: A time-of-flight telescope for charged particles produced in neutron-induced reactions. Nuclear Instruments & Methods in Physics Research, Section A (Accelerators, Spectrometers, Detectors and Associated Equipment) 1985;228:349-353.
19. Hall EJ, Hei, T.K. and Randers-Pehrson, G.: Radon-induced transformation. In Peter A. Cerutti OFNaMCS (ed): 2nd Int. Conference on Anticarcinogenesis and Radiation Protection. Plenum Publishing Corp. , 1988.
20. Goldhagen P, Randers-Pehrson, G., Marino, S.A. and Kliauga, P.: Variance-covariance measurements of yd for 15-MeV neutrons in a wide range of site sizes. In J. Booz JADaHM (ed): Tenth Symposium on Microdosimetry. Radiat. Prot. Dosim. , 1990:167-170.
21. Miller RC, Brenner, DJ, Randers-Pehrson, G, Marino, SA, Hall, EJ: The effects of the temporal distribution of dose on oncogenic transformation by neutrons and charged particles of intermediate LET. Radiation research. 1990;124:S62-68.
22. Geard CR, 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. Inst. Meth. 1991;B54:411-416.
23. Miller RC, Geard, CR, Marino, SA, Richards, M, Randers-Pehrson, G: Oncogenic transformation following sequential irradiations with monoenergetic neutrons and X rays. Radiation research. 1991;125:338-342.
24. Brenner DJ, 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. In R. Jahr ea (ed): Seventh Symposium on Neutron Dosimetry. Nuclear Technology Publishing, Kent, England, 1992:45-48.
25. Goldhagen P, and Randers-Pehrson, G. : Variance - covariance: A practical method for microdosimetry in submicroscopic volumes. In 9th International Congress of Radiation Research. Academic Press, 1992:415-420.
26. Brenner DJ, Hall, EJ, Randers-Pehrson, G, Miller, RC: Mechanistic considerations on the dose-rate/LET dependence of oncogenic transformation by ionizing radiations. Radiation research. 1993;133:365-369.
27. Miller RC, Randers-Pehrson, G, Hieber, L, Marino, SA, Richards, M, Hall, EJ: The inverse dose-rate effect for oncogenic transformation by charged particles is dependent on linear energy transfer. Radiation research. 1993;133:360-364.

28. Miller RC, Marino, SA, Brenner, DJ, Martin, SG, Richards, M, Randers-Pehrson, G, Hall, EJ: The biological effectiveness of radon-progeny alpha particles. II. Oncogenic transformation as a function of linear energy transfer. *Radiation research*. 1995;142:54-60.
29. Brenner DJ, Hall, EJ, Randers-Pehrson, G, Huang, Y, Johnson, GW, Miller, RW, Wu, B, Vazquez, ME, Medvedovsky, C, Worgul, BV: Quantitative comparisons of continuous and pulsed low dose rate regimens in a model late-effect system. *International journal of radiation oncology, biology, physics*. 1996;34:905-910.
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31. Hei TK, Wu, LJ, Liu, SX, Vannais, D, Waldren, CA, Randers-Pehrson, G: Mutagenic effects of a single and an exact number of alpha particles in mammalian cells. *Proceedings of the National Academy of Sciences of the United States of America*. 1997;94:3765-3770.
32. Hei TK, Wu, LJ, Randers-Pehrson, G: Cytoplasmic irradiation: Biological consequences and role of oxyradicals. *Free Radical Biology and Medicine* 1998;25:S4-S4.
- *33. Randers-Pehrson G, Brenner, DJ: A practical target system for accelerator-based BNCT which may effectively double the dose rate. *Medical physics*. 1998;25:894-896.
34. Miller RC, Randers-Pehrson, G, Geard, CR, Hall, EJ, Brenner, DJ: The oncogenic transforming potential of the passage of single alpha particles through mammalian cell nuclei. *Proceedings of the National Academy of Sciences of the United States of America*. 1999;96:19-22.
35. Wu LJ, Randers-Pehrson, G, Xu, A, Waldren, CA, Geard, CR, Yu, Z, Hei, TK: Targeted cytoplasmic irradiation with alpha particles induces mutations in mammalian cells. *Proceedings of the National Academy of Sciences of the United States of America*. 1999;96:4959-4964.
- *36. Dymnikov AD, Brenner, DJ, Johnson, G, Randers-Pehrson, G: Theoretical study of short electrostatic lens for the Columbia ion microprobe. *Review of Scientific Instruments* 2000;71:1646-1650.
- *37. Dymnikov AD, Brenner, DJ, Johnson, G, Randers-Pehrson, G: Electrostatic lens design for the Columbia microbeam. *Radiation Research* 2000;153:236-237.
38. Geard CR, Randers-Pehrson, G, Marino, SA, Jenkins-Baker, G, Hei, T, Hall, EJ, Brenner, DJ: Intra- and intercellular responses after cell site-specific microbeam irradiation. *Radiation Research* 2000;153:233-233.
39. Miller RC, Sawant, S, Randers-Pehrson, G, Marino, SA, Geard, CR, Hall, EJ, Brenner, DJ: Single alpha-particle traversals and tumor promoters. *Radiation Research* 2000;153:227-227.
- *40. Randers-Pehrson G, Geard, C, Johnson, G, Brenner, D: Technical characteristics of the Columbia university single-ion microbeam. *Radiation Research* 2000;153:221-223.
41. Zhou H, Randers-Pehrson, G, Waldren, CA, Vannais, D, Hall, EJ, Hei, TK: Induction of a bystander mutagenic effect of alpha particles in mammalian cells. *Proceedings of the National Academy of Sciences of the United States of America*. 2000;97:2099-

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43. Zhou HN, Randers-Pehrson, G, Waldren, CA, Vannais, D, Hall, EJ, Hei, TK: Induction of a bystander mutagenic effect of alpha particles in mammalian cells. *Proceedings of the National Academy of Sciences of the United States of America* 2000;97:2099-2104.
44. Geard CR, Jenkins-Baker, G, Ponnaiya, B, Zhang, M, Bigelow, A, Brenner, DJ, Randers-Pehrson, G: Probing the origins of radiation-induced biological damage in normal human cells with a charged-particle microbeam. *Radiation Research* 2001;156:435-436.
45. Hei TK, Zhou, HN, Randers-Pehrson, G: Induction of bystander mutagenesis by single alpha particles. *Radiation Research* 2001;156:440-440.
- *46. Randers-Pehrson G, Geard, CR, Johnson, G, Elliston, CD, Brenner, DJ: The Columbia University single-ion microbeam. *Radiation research.* 2001;156:210-214.
47. Sawant SG, Randers-Pehrson, G, Geard, CR, Brenner, DJ, Hall, EJ: The bystander effect in radiation oncogenesis. I. Transformation in C3H 10T $\frac{1}{2}$ cells in vitro can be initiated in the unirradiated neighbors of irradiated cells. *Radiation Research* 2001;155:397-401.
48. Sawant SG, Randers-Pehrson, G, Metting, NF, Hall, EJ: Adaptive response and the bystander effect induced by radiation in C3H 10T(1/2) cells in culture. *Radiation research.* 2001;156:177-180.
49. Zhou HN, Suzuki, M, Randers-Pehrson, G, Vannais, D, Chen, G, Trosko, JE, Waldren, CA, Hei, TK: Radiation risk to low fluences of alpha particles may be greater than we thought. *Proceedings of the National Academy of Sciences of the United States of America* 2001;98:14410-14415.
- *50. Bigelow AW, Randers-Pehrson, G, Brenner, DJ: Laser ion source development for the Columbia University microbeam. *Review of Scientific Instruments* 2002;73:770-772.
51. Bigelow W, Randers-Pehrson, G, Brenner, DJ: Laser ion source design for the Columbia University microbeam. *Radiation Research* 2002;158:368-369.
52. Brenner DJ, Sawant, SG, Hande, MP, Miller, RC, Elliston, CD, Fu, Z, Randers-Pehrson, G, Marino, SA: Routine screening mammography: how important is the radiation-risk side of the benefit-risk equation? *International Journal of Radiation Biology* 2002;78:1065-1067.
53. Geard CR, Jenkins-Baker, G, Ponnaiya, B, Zhang, M, Bigelow, A, Randers-Pehrson, G: Probing the origins of radiation-induced biological damage in normal human cells with a charged-particle microbeam. *Radiation Research* 2002;158:379-380.
- *54. Randers-Pehrson G: Microbeams, microdosimetry and specific dose. In 13th Symposium on Microdosimetry. Stresa, Lago Maggiore, Italy, Nuclear Technology Publishing, 2002:471-472.
- *55. Randers-Pehrson G, Johnson, GW, Marino, SA, Bigelow, A, Zhang, M, Geard, CR, Brenner, DJ: Status of the second Columbia University Microbeam Facility. *Radiation Research* 2002;158:369-370.
56. Sawant SG, Zheng, W, Hopkins, KM, Randers-Pehrson, G, Lieberman, HB, Hall, EJ:

- The radiation-induced bystander effect for clonogenic survival. *Radiation Research* 2002;157:361-364.
57. Zhou H, Randers-Pehrson, G, Suzuki, M, Waldren, CA, Hei, TK: Genotoxic damage in non-irradiated cells: contribution from the bystander effect. In 13th Symposium on Microdosimetry. Stresa, Lago Maggiore, Italy, Nuclear Technology Publishing, 2002:227-232.
 58. Zhou H, Randers-Pehrson, G, Waldren, CA, Trosko, JE, Hall, EJ, Hei, TK: Bystander mutagenesis induced by a single alpha particle is mediated by cell-cell communication. *Radiation Research* 2002;158:381-382.
 - *59. Bigelow AW, Randers-Pehrson, G, Brenner, DJ: Proposed laser ion source for the Columbia University microbeam. *Nuclear Instruments & Methods in Physics Research Section B-Beam Interactions with Materials and Atoms* 2003;210:65-69.
 60. Hongning Z, Randers-Pehrson, G, Geard, CR, Brenner, DJ, Hall, EJ, Hei, TK: Interaction between radiation-induced adaptive response and bystander mutagenesis in mammalian cells. *Radiation Research* 2003;160:512-516.
 61. Zhou H, Randers-Pehrson, G, Geard, CR, Brenner, DJ, Hall, EJ, Hei, TK: Interaction between radiation-induced adaptive response and bystander mutagenesis in mammalian cells. *Radiation research.* 2003;160:512-516.
 62. Belyakov O, Hall, EJ, Marino, SA, Randers-Pehrson, G, Geard, CR, Hei, TK, Sachs, RK, Brenner, DJ: Studies of bystander effects in 3D human tissue systems: What can they mean? *Radiation Research* 2004;161:119-119.
 - *63. Bigelow AW, Randers-Pehrson, G, Brenner, DJ: Update on the laser ion source for the Columbia University microbeam. *Radiation Research* 2004;161:101-101.
 64. Geard CR, Jenkins-Baker, G, Bigelow, A, Brenner, DJ, Hall, EJ, Hei, TK, Marino, S, Randers-Pehrson, G, Ponnaiya, B: Single-cell gene expression and microbeam irradiation: The concept of the average cell. *Radiation Research* 2004;161:110-110.
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 67. Ponnaiya B, Jenkins-Baker, G, Brenner, DJ, Hall, EJ, Randers-Pehrson, G, Geard, CR: Biological responses in known bystander cells relative to known microbeam-irradiated cells. *Radiation Research* 2004;162:426-432.
 68. Zhou H, Randers-Pehrson, G, Hall, EJ, Brenner, DJ, Geard, C, Hei, TK: Interaction of radiation-induced adaptive response and bystander mutagenesis in mammalian cells. *Radiation Research* 2004;161:115-115.
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 70. Belyakov OV, Mitchell, SA, Parikh, D, Randers-Pehrson, G, Marino, SA, Amundson, SA, Geard, CR, Brenner, DJ: Biological effects in unirradiated human tissue induced by radiation damage up to 1 mm away. *Proceedings of the National Academy of Sciences of the United States of America* 2005;102:14203-14208.

- *71. Bigelow AW, Randers-Pehrson, G, Kelly, RP, Brenner, DJ: Laser ion source for Columbia University's microbeam. *Nuclear Instruments & Methods in Physics Research Section B-Beam Interactions with Materials and Atoms* 2005;241:874-879.
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- *73. Garty G, Randers-Pehrson, G, Brenner, DJ: Development of a secondary-electron ion-microscope for microbeam diagnostics. *Nuclear Instruments & Methods in Physics Research, Section B (Beam Interactions with Materials and Atoms)* 2005;231:60-64.
- *74. Garty G, Ross, GJ, Bigelow, A, Randers-Pehrson, G, Brenner, DJ: A microbeam irradiator without an accelerator. *Nuclear Instruments & Methods in Physics Research Section B-Beam Interactions with Materials and Atoms* 2005;241:392-396.
- *75. Ross GJ, Bigelow, AW, Randers-Pehrson, G, Peng, CC, Brenner, DJ: Phase-based cell imaging techniques for microbeam irradiations. *Nuclear Instruments & Methods in Physics Research Section B-Beam Interactions with Materials and Atoms* 2005;241:387-391.
- *76. Ross GJ, Garty, G, Randers-Pehrson, G, Brenner, DJ: A single-particle/single-cell microbeam based on an isotopic alpha source. *Nuclear Instruments & Methods in Physics Research, Section B (Beam Interactions with Materials and Atoms)* 2005;231:207-211.

B. Case Reports

C. Reviews, Chapters and Editorials

1. Miller, R.C., Geard, R.C., Brenner, D.J., Komatsu, K., Randers-Pehrson, G., Marino, S.A. and Hall, E.J. The effects of temporal distribution of dose on neutron-induced oncogenic transformation. In *Cell Transformation and Radiation-Induced Cancer* (K.H. Chadwick, C. Seymour, and B. Barnhart, Eds.), pp. 357-362, Adam Hilger, U.K., 1989.
2. Miller, R.C., Randers-Pehrson, G., Hieber, L., Marino, S.A., Kellerer, A. and Hall, E.J. Influence of dose protraction of intermediate and high LET radiation on oncogenic transformation. In *New Developments in Fundamental and Applied Radiobiology* (C.B Seymour and C. Mothersill, Eds.), pp. 177-182, Taylor and Francis, Ltd., 1991.
3. Brenner, D.J., Miller, R.C., Marino, S.A., Geard, C.R., Randers-Pehrson, G., and Hall, E.J. Dose rate effects for oncogenesis by medium LET radiations. In *Low Dose Irradiation and biological Defense Mechanisms*, Elsevier Science Publishers, Amsterdam, 1992
4. Goldhagen, P. and Randers-Pehrson, G. Variance-Covariance: A practical method for microdosimetry in submicroscopic volumes. In *Radiation Research: A Twentieth Century Perspective, volume II: Congress Proceedings* (W.C. Dewey, et al., Eds.), pp. 415-420, Academic Press, Inc., San Diego, 1992.

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6. Geard, C.R., Ponnaiya, B., Jenkins-Baker, G., Hei, T.K., Brenner, D.J., Hall, E.J. and Randers-Pehrson, G. Microbeam mediated cellular effects: Observations and implications for low dose radiation risk assessment. In *Molecular Mechanisms for Radiation-induced Cellular Response and Cancer Development*, Tanaka, K., Takabataka, T., Fujikawa, K., Matsumoto, T. and Sato, F., Eds. Institute for Environmental Science, Japan, p. 82-88, 2002
7. Geard, C.R., Randers-Pehrson, G., Hei, T.K., Jenkins, G.J., Miller, R.C., Wu, L.J. Brenner, D.J. and Hall, E.J. Microbeam mediated cellular effects: single a particle induced chromosomeal damage, cell cycle delay, mutation and oncogenic transformation. In *Microdosimetry, An Interdisciplinary Approach* (D.T. Goodhead and H.G. Menzel, Eds.) pp.327-330, The Royal Society of Chemistry, Cambridge, U.K., 1997.

B. Patents

Gerhard Randers-Pehrson and David Brenner; Substance detection device using monoenergetic neutrons; United States Patent Number 5,818,054 issued October 6, 1998

C. Abstracts

D. Audiovisual/Media