
BIOGRAPHICAL SKETCH

<u>NAME</u>	<u>POSITION TITLE</u>	<u>BIRTHDATE</u>
James F. Hainfeld	Principal Investigator	10/20/45

EDUCATION

<i>Institution and Location</i>	<i>Degree</i>	<i>Year conferred</i>	<i>Field of Study</i>
University of Chicago (Advisors: A. V. Crewe & T. L. Steck)			Postdoctoral Study
University of Texas at Austin (Thesis advisors: D. J. DeRosier & L. J. Reed)	Ph. D.	1974	Chemistry (Biochemistry)
Princeton University	B. S. E.	1967	Electrical Engineering

RESEARCH EXPERIENCE AND EMPLOYMENT

2003-Present Adjunct Professor, Department of Biomedical Engineering,
State University of New York at Stony Brook

1990-Present President and Chief Research Scientist, Nanoprobes, Inc.

1981- 2009 Biophysicist, Biology Department, Brookhaven National Laboratory

1978-81 Associate Biophysicist, Biology Department, Brookhaven National Laboratory

1976-78 Assistant Biophysicist, Biology Department, Brookhaven National Laboratory

1974-76 Research Associate, University of Chicago

1971 Fellow, National Science Foundation

1970-71 Teaching assistant, University of Texas, Austin

Committees/Honors:

2011 Recipient of the Röntgen Prize awarded by the British Institute of Radiology

2008 Recipient of the Long Island Technology Hall of Fame Patent Award, March 6, 2008

2002 – 2005, Editorial Board – Journal of Histochemistry and Cytochemistry

1998-2003 Nationally elected Council Member for The Histochemical Society

Brookhaven National Lab Lecture Committee Biology Dept Representative (completed)

Brookhaven Natl Lab Microcomputer Club (BERA Activity) Founder/President (completed)

2003 – Present, NIH Study Section, Microscopic Imaging, ZRG1 MI

Ad Hoc reviewer NIH Study section: Radiation Research, ZRG1 RAD

Ad Hoc reviewer NIH Study section: Molecular & Cellular Biophysics, BBKA

Ad Hoc reviewer NIH Study section: Special Reviews (SR BST, ZRG1 BST)

Ad Hoc reviewer NIH Study section: NCI Small Business Innovation Research Contract proposals

Ad Hoc reviewer NIH Study section: Gene and Drug Delivery Systems (GDD)

Ad Hoc reviewer NIH other study sections

Ad Hoc reviewer for DOE

SELECTED PUBLICATIONS

- Huang, HS and Hainfeld, JF. Intravenous magnetic nanoparticle cancer hyperthermia. International Journal of Nanomedicine July 2013 Volume 2013:8 Pages 2521 – 2532.
- Hainfeld, J.F., O'Connor, M.J., Lin, P.P., Smilowitz, H.M. 2012. Cancer Therapy with wIRA and Gold Nanoparticles. In: Water-Filtered Infrared-A Radiation: From Basic

Principles to Clinical Applications. D. Bickes-Kelleher, H-W. Muller, P. Paupel (eds). Wissenschaftliche Verlagsgesellschaft, Stuttgart. Manuscript Submitted. In Press.

3. Hainfeld JF, Smilowitz HM, O'Connor MJ, Dilmanian FA, Slatkin DN. Gold nanoparticle imaging and radiotherapy of brain tumors in mice. *Nanomedicine (Lond)*. 2012 Dec 24. [Epub ahead of print] PMID: 23265347.
4. Powell RD, Hainfeld JF. Preparation and high-resolution microscopy of gold cluster labeled nucleic acid conjugates and nanodevices. *Micron*. 2011 Feb;42(2):163-74. Epub 2010 Sep 8. PMID: 20869258.
5. Ackerson CJ, Powell RD, Hainfeld JF. Site-specific biomolecule labeling with gold clusters. *Methods Enzymol*. 2010;481:195-230. PMID: 20887859.
6. Hainfeld JF, O'Connor MJ, Dilmanian FA, Slatkin DN, Adams DJ, Smilowitz HM. Micro-CT enables microlocalisation and quantification of Her2-targeted gold nanoparticles within tumour regions. *Br J Radiol*. 2011 Jun;84(1002):526-33. PMID: 21081567.
7. W Liu, D Mitra, V Joshi, R Powell, J Hainfeld, J Serrano-Velez, E Rosa-Molinar, I Torres-Vasquez, E Rosa-Molinar and P Takvorian (2011). EnzMet for Versatile, Highly Sensitive Light and Electron Microscopy Staining. *Microscopy and Microanalysis*, 17 (Suppl. 2) , pp 116-117. doi:10.1017/S1431927611001450.
8. Joshi, V, M Jain, F Furuya, R Powell, J Hainfeld, M Llaguno and D Hilgemann (2011). HaloTag® Protein-Mediated Live Cell Imaging with Bigger FluoroNanogold™. *Microscopy and Microanalysis*, 17 (Suppl. 2) , pp 150-151. doi:10.1017/S1431927611001620.
9. V Joshi, M Jain, F Furuya, R Powell, J Hainfeld, J Nelson, C Jacobsen, J Quinn and A Neiman (2011). Combined Texas Red and 1.8 nm FluoroNanohold™ for Multimodal Imaging. *Microscopy and Microanalysis*, 17 (Suppl. 2) , pp 152-153. doi:10.1017/S1431927611001632.
10. Hainfeld JF, Dilmanian FA, Zhong Z, Slatkin DN, Kalef-Ezra JA, Smilowitz HM. Gold nanoparticles enhance the radiation therapy of a murine squamous cell carcinoma. *Phys Med Biol*. 2010;55:3045-3059.
11. Dubendorff, JW, E Lyman, FR Furuya and JF Hainfeld (2010). Gold Labeling of Protein Fusion Tags for EM. *Microscopy and Microanalysis*, 16 (Suppl. 2) , pp 866-867. doi:10.1017/S1431927610061465.
12. Joshi, VN, D Mitra, MD England, FR Furuya, RD Powell and JF Hainfeld (2010). Large Covalently Linked Fluorescent and Gold Nanoparticle Immunoproboscopes. *Microscopy and Microanalysis*, 16 (Suppl. 2) , pp 966-967. doi:10.1017/S1431927610061969.
13. Wall Joseph S.; Simon Martha N.; Hainfeld James F. History of the STEM at Brookhaven National Laboratory, Hawkes, PW, *Advances In Imaging And Electron Physics*, Vol 159: Cold Field Emission And The Scanning Transmission Electron Microscope *Advances in Imaging and Electron Physics* Volume: 159 Pages: 101-121 DOI: 10.1016/S1076-5670(09)59003-9, 2009

14. Hainfeld, J.F., Slatkin, D.N., Dilmanian, F.A., Smilowitz, H.M. 2008. Radiotherapy Enhancement with Gold Nanoparticles. *J. Pharmacy and Pharmacology*. 60: 977-985 (PMID 18644191) Volume 60 #8 is a Special Issue: Radiation Biology – Can New Concepts Achieve Better Treatment Outcomes? JPP has informed us that this paper is one of the top 25 most downloaded papers in 2008.
15. Briñas RP, Hu M, Qian L, Lyman ES, Hainfeld JF. Gold nanoparticle size controlled by polymeric Au(I) thiolate precursor size. *J Am Chem Soc*. 2008 Jan 23;130(3):975-82.
16. Hu M, Zhang YB, Qian L, Briñas RP, Kuznetsova L, Hainfeld JF. Three-dimensional structure of human chromatin accessibility complex hCHRAC by electron microscopy. *J Struct Biol*. 2008 Dec;164(3):263-9.
17. Hu M, Lyman E, Zhang YB, Qian L, Briñas R, Kuznetsova L, Hainfeld J. Three-dimensional structure of ATP-dependent molecular machine hCHRAC for chromatin remodeling. *Microsc Microanal*. 2008 Aug;14 Suppl 2:1588-9. doi:10.1017/S1431927608081324.
18. Hu, M., Qian, L., Briñas, R.B., Lyman, E.S, Kuznetsova, L., and Hainfeld, J.F. "Gold nanoparticle-protein arrays improve resolution for cryo-electron microscopy", *Journal of Structural Biology*, 2008 Jan;161(1):83-91.
19. Minghui Hu, Luping Qian, Raymond P Brifias, Elena S Lyman, and James F Hainfeld, Protein Assembly Through Site-specific Interactions with Gold Nanoparticles. *Mater. Res. Soc. Symp. Proc. Vol. 951 (2007) Materials Research Society 0951-EIO-IO*
20. Hu, M, L Qian, RP Brinas, ES Lyman, L Kuznetsova and JF Hainfeld (2007). Nanoparticle-protein Arrays Improve Protein Structural Analysis in Cryo-electron Microscopy. *Microscopy and Microanalysis*, 13 (Suppl. 02) , pp 416-417. doi:10.1017/S1431927607071905.
21. Powell, RD, VN Joshi, PM Takvorian, A Cali and JF Hainfeld (2007). Correlative Enzymatic and Gold Probes for Light and Electron Microscopy. *Microscopy and Microanalysis*, 13 (Suppl. 02) , pp 244-245. doi:10.1017/S143192760707451X.
22. Powell RD, Pettay JD, Powell WC, Roche PC, Grogan TM, Hainfeld JF, Tubbs RR. Metallographic in situ hybridization. *Hum Pathol*. 2007 Aug;38(8):1145-59.
23. Hu M, Qian L, Brinas RP, Lyman ES, Hainfeld JF. Assembly of Nanoparticle-Protein Binding Complexes: From Monomers to Ordered Arrays. *Angew Chem Int Ed Engl*. 2007 Jul 2;46(27):5111-5114.
24. Hainfeld JF, Slatkin DN, Focella TM, Smilowitz HM. Gold nanoparticles: a new X-ray contrast agent. (2006). *Br J Radiol*. Mar;79(939):248-53.
25. Hu, Minghui, Luping Qian, Raymond P Briñas, Elena S Lyman and James F Hainfeld (2006). Protein Assembly Through Site-specific Interactions with Gold Nanoparticles. *MRS Proceedings*, 951, 0951-E10-10 doi:10.1557/PROC-0951-E10-10.
26. Powell, R, V Joshi, A Thelian, W Liu, P Takvorian, A Cali and J Hainfeld (2006). Light and Electron Microscopy of Microsporida using Enzyme Metallography. *Microscopy and Microanalysis*, 12 (Suppl. 02) , pp 424-425. doi:10.1017/S1431927606064749.

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28. Reddy, V, E Lyman, M Hu and J F Hainfeld (2005). 5 nm Gold-Ni-NTA Binds His Tags. *Microscopy and Microanalysis*, 11 (Suppl. 02) , pp 1118-1119. doi:10.1017/S1431927605507712.
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37. F. R. Furuya, V. N. Joshi., J. F. Hainfeld, R. D. Powell, and P. M. Takvorian. Enzymatic Metallography as a Correlative Light and Electron Microscopy Method. *Microsc. Microanal.*, 10, Suppl. 2. *Proceedings of Microscopy and Microanalysis 2004*; Anderson, I. M.; Price, R.; Hall, E.; Clark, E., and McKernan, S., Eds.; Cambridge University Press, New York, NY, 2004, p. 1210CD. or *Microscopy Method. Microscopy and Microanalysis*, 10 (Suppl. 02) , pp 1210-1211. doi:10.1017/S1431927604886136.

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44. Tubbs R, Skacel M, Pettay J, Powell R, Myles J, Hicks D, Sreenan J, Roche P, Stoler MH, Hainfeld J. Interobserver interpretative reproducibility of GOLDFISH, a first generation gold-facilitated autometallographic bright field in situ hybridization assay for HER-2/neu amplification in invasive mammary carcinoma. *Am J Surg Pathol.* 2002 Jul;26(7):908-13.
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51. J. F. Hainfeld, R. N. Eisen, R. R. Tubbs, and R. D. Powell, Enzymatic Metallography: A Simple New Staining Method. *Microsc. Microanal.*, 8, Suppl. 2. Proceedings of Microscopy and Microanalysis 2002; Voekl, E.; Piston, D.; Gauvin, R.; Lockley, A. J.; Bailey, G. W., and McKernan, S., Eds.; Cambridge University Press, New York, NY, 2002, p. 916CD. or *Microscopy and Microanalysis*, 8 (Suppl. 02) , pp 916-917.
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PATENTS

1. 8,323,694 Gold nanoparticles for selective IR heating
2. 8,033,977 Methods of enhancing radiation effects with metal nanoparticles
3. 7,951,554 Kit for enzymatic deposition of a metal
4. 7,906,147 Functional associative coatings for nanoparticles
5. 7,892,781 Detecting a target using a composite probe comprising a directing agent, a metal nanoparticle and an enzyme
6. 7,888,060 Method for detecting a target using enzyme directed deposition of elemental metal
7. 7,746,979 Methods for assisting recovery of damaged brain and spinal cord and treating various diseases using arrays of x-ray microplanar beams
8. 7,691,598 Method for detecting a target molecule by metal deposition
9. 7,592,153 Method of reducing metal ions to elemental metal in the vicinity of an oxido-reductase enzyme
10. 7,530,940 Methods of enhancing radiation effects with metal nanoparticles
11. 7,367,934 Methods of enhancing radiation effects with metal nanoparticles
12. 7,364,872 Test methods using enzymatic deposition and alteration of metals
13. 7,194,063 Methods for implementing microbeam radiation therapy
14. 7,183,072 Kit for detecting Her-2/neu gene by site-specific metal deposition
15. 6,955,639 Methods of enhancing radiation effects with metal nanoparticles
16. 6,818,199 Media and methods for enhanced medical imaging
17. 6,670,113 Enzymatic deposition and alteration of metals
18. 6,645,464 Loading metal particles into cell membrane vesicles and metal particular use for imaging and therapy
19. 6,534,039 Extended organic cobalt and nickel magnetic complexes
20. 6,521,773 Extended organic cobalt and nickel magnetic complexes
21. 6,369,206 Metal organothiol particles
22. 6,121,425 Metal-lipid molecules
23. 5,690,903 Loading and conjugating cavity biostructures
24. 5,521,289 Small organometallic probes
25. 5,443,813 Loading and conjugating cavity biostructures
26. 5,360,895 Derivatized gold clusters and antibody-gold cluster conjugates