

CURRICULUM VITAE

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Date & Place of Birth: January 4, 1962 Kingston, PA

Education:

1983	Physics	B.S.	California Institute of Technology, Pasadena, CA
1984	Physics	M.S.	University of California, Los Angeles, CA
1990	Theoretical Particle Physics	Ph.D.	University of California, Los Angeles, CA

Postdoctoral Training:

1990-1992	Postdoc Experimental Particle Physics, University of California, Los Angeles, CA
1992-1994	Staff Scientist Molecular Genetics and Genomics, The Salk Institute for Biological Studies, La Jolla, CA
1994-1996	Research Associate Genomics and Bioinformatics, Stanford Human Genome Center, Palo Alto, CA

Academic Appointments:

2008- present	Director, Center for Cancer Computational Biology, Dana-Farber Cancer Institute <u>Research Activities:</u> Integrative approaches to data analysis focused on clinical and translational applications and linking clinical and laboratory data in support of basic research.
2005- present	Professor of Biostatistics and Computational Biology, Department of Biostatistics and Computational Biology, Dana-Farber Cancer Institute

Professor of Cancer Biology, Department of Cancer Biology, Dana-Farber Cancer Institute

Research Activities: Application of genomic technologies and integrative computational analysis and modeling of cellular systems to the understanding of human cancers and other diseases.

2005- present Professor of Computational Biology and Bioinformatics, Department of Biostatistics, Harvard School of Public Health

Research Activities: Application of genomic technologies and integrative computational analysis and modeling of cellular systems to the understanding of human cancers and other diseases.

2007 – present Adjunct Professor of Bioinformatics, Boston University

2003- 2005 Professor, Chemical Engineering, University of Maryland

2002 - 2006 Investigator, The Institute for Genomic Research

Research Activities: Development and implementation of technology and strategies necessary for functional analysis of the human and other genomes. Analysis of human gene expression in colon tumors using microarrays, rodent models of heart, lung, blood and sleep disorders and gene expression in Arabidopsis. Director of the TIGR Gene Index Project.

2000- 2005 Professor, Department of Biochemistry, The George Washington University
Activities: Instructor in various courses, curriculum committee for Genomics.

1998 – 2005 Lecturer, The Department of Biostatistics, The Johns Hopkins University. Activities: Instructor in the Masters In Biotechnology Program

1997 - 2001 Associate Investigator, The Institute for Genomic Research
Activities: Development and implementation of technology and strategies necessary for functional analysis of the human and other genomes. Analysis of human gene expression in colon tumors using microarrays, rodent models of heart, lung, blood and sleep disorders and gene expression in Arabidopsis. Director of the TIGR Gene Index Project

1997 Assistant Investigator, The Institute for Genomic Research
Research Activities: Development and implementation of technology and strategies necessary for functional analysis of the human and other genomes.

1994 - 1997 Research Associate, Stanford Human Genome Center, Stanford University
Research Activities: Project leader for development and implementation of a transposon-mediated strategy for large-scale genomic DNA sequencing including development and implementation of laboratory protocols, computer software, and instrumentation.

- 1992 - 1994 Staff Scientist, The Salk Institute for Biological Studies, Molecular Genetics Laboratory Research Activities: Development of improved methods for DNA sequencing, combinatoric strategies and devices for screening large libraries, simulation and optimization of single pass sequencing strategies including genome sequence sampling. Project director for the STS content mapping of chromosome 11.
- 1990 - 1992 Postdoctoral Fellow, Department of Physics, University of California, Los Angeles Research Activities: Research in particle physics, field theory and phenomenology. Founding member of the Antiproton Experiment (APEX) collaboration that set the world's best experimental limit on the lifetime of the antiproton.
- 1987 - 1992 Visiting Lecturer, Department of Physics, University of California, Los Angeles
- 1984 - 1996 Physics Instructor, Southern California Science Institute, New College of California
- 1983 - 1990 Teaching Fellow, Department of Physics, University of California, Los Angeles
- 1983 - 1990 Research Fellow, Department of Physics, University of California, Los Angeles *Thesis Supervisor: E.T. Tomboulis*
Research Activities: Research in elementary particle physics, mathematical physics, field theory focusing on the development of two-dimensional gauge field theory models and the construction of associated string theory models.

Hospital or Affiliated Institution Appointments:

- 2003 - 2005 Adjunct Professor, Department of Biostatistics, Bloomberg School of Public Health, The Johns Hopkins University
- 2005- present Professor, Department of Biostatistics and Computational Biology, Dana-Farber Cancer Institute

Hospital and Health Care Organization Service Responsibilities:

- 2005- present Primary research areas are functional genomics and bioinformatics focused on the integration of diverse data types to provide insight into biological systems with the goal of identifying mechanisms underlying a range of human diseases. Department of Biostatistics and Computational Biology, Dana-Farber Cancer Institute

Major Committee Assignments:

1994	National Laboratory Genome Project Visit Review Panel, DOE
1995	Caltech/BAC Library Construction Site Visit Review Panel, DOE
1996-1998	Bioinformatics Grant Review Panel, DOE
1997-2001	Grant Review Panel, DOE
1997	Hollander Fellowship Review Panel, DOE
1997	Five-Year Program Advisory Committee, NCRR
1997	Cancer Chromosome Anatomy Project program Steering Committee, NCI
1998	National Laboratory Functional Genomic Review Panel, DOE
1998	Full-Length cDNA Library Construction and Sequencing Advisory, Committee, NCI
1998	Functional Genomics Panel, Wellcome Trust
1998	Genomics Grant Review Panel, NSF SBIR
1998	Special Program in Tropical Disease Research Review, UNDP/World Bank/WHO
1999-2000	Low-Dosage radiation Grant Review Panel, DOE
1999	Bioinformatics Review Panel, NSF
1999	Special Emphasis Review Panel, NHLBI
1999	Microarray Working Group Advisory Panel, NIDCR
1999	Special Emphasis Review Panel, NIMH
1999	Plant Biology Review Panel, NSF
1999-2007	Board of Directors, MGED
2000	Grant Review Panel, NIDA SBIR
2000	Plant Biology Review Panel, USDA
2000	Plant Biology Review Panel, NSF
2000	Exceptional Chromosome Regions Working Group, DOE
2000	Working Group on US Scientific Interactions, NSF
2000-2006	Genome/GCAT study section, NIH
2000-2003	PGA Coordinating Committee, NHLBI
2000-2003	PGA Bioinformatics Committee, NHLBI
2000-2003	PGA Microarray Committee, NHLBI
2000	Working Group on Australia Scientific Interactions, NSF
2001	Review Meeting RFP ES-01-01 National Center for Toxicogenomics (NCT) Microarray Resource, HIEHS
2001-2003	Plant Genome Scientific Advisory Board, University of Georgia
2001-2003	Innovative Technology Review Panel, NCI
2001-2002	Genome Study Section, NIH
2002-2006	GCAT Study Section, NIH
2001	Bioinformatics in Neuroscience and Sleep Research Workshop, NIDDK
2001	Plant Genome Site Visit Panel, NSF
2001-2003	BISTI Review Panel, NIH
2001-2003	Grant Review Panel, NCI
2002	Microarray Supplement Review Panel, NHLBI
2002-2006	Panel on Emerging Issues in Toxicogenomics, NRC
2004-2006	Panel on Applications of Toxicogenomics, NRC
2003-2010	Genome British Columbia Scientific Advisory Board
2005-present	EPA Board of Scientific Counselors

2005-present	St. Jude's Children's Research Hospital Scientific Advisory Board
2006-2007	Harvard School of Public Health, Lefkopoulou Award Committee Member
2006	Dana Farber Cancer Institute, Computational Biology Search Chair
2005	EU FP6 Grant Review Panel
2006-2007	Harvard School of Public Health, Seminar Committee Member
2006-2019	Harvard School of Public Health, Curriculum Committee Member
2006-2009	Harvard School of Public Health, Computational Biology Search Chair
2007-present	EU FP7 Genomics Grant Review Panel
2008-present	Lovelace Respiratory Research Institute, Scientific Advisory Board
2008-2010	NAS Panel on Collecting, Storing, and Distributing Biodata linked to Social Science Surveys
2009	RC1 Grant Review "Editorial Review" Panel
2009	RC2 Genomic Science Grant Review
2009	Epigenomics Roadmap Grant Review Panel
2009-present	Epigenomics Roadmap Advisory Board
2010	NCI EUREKA Grant Review Panel
2010	Chair, NCCR S10 Grant Review Panel

Professional Societies:

1988	American Physical Society	Member
1988	APS Biophysics Division	Member
1988	APS International Physics Group	Member
1988	APS Division of Particles and Fields	Member
1988	World Federation of Scientists	Member
1990	Microarray Gene Expression Data Society (MGED)/ Functional Genomics Data Society (FGED)	Member Board Member
	(2011-)	President
1995	The Human Genome Organization (HUGO)	Member
1996	Association of Science Professionals (ASP)	Member
1998	American Association for the Advancement of Science (AAAS)	Member
1999	Center for the Study of the Evolution of Life (CSEOL)	Member
2005	American Association for Cancer Research	Member

Community Service Related to Professional Work:

I have presented more than 200 talks, courses, and workshops since joining Dana-Farber and the Harvard School of Public Health in 2005; detailed lists will be provided upon request. I have also taught numerous courses and workshops on the analysis of genomic data, and have served as an organizer of the EMBO course on DNA microarray analysis for more than 5 years.

In addition, I have served on the Scientific Advisory Board of the St. Jude's Children's Research Hospital, the Board of Scientific Counselors of the Environmental Protection Agency

(Peer Review for Scientific Journals)

1994-2010	<i>Genomics</i>
1994-2009	<i>BioTechniques</i>
1996-2010	<i>Genome Research</i>
2000-2010	<i>Genome Biology</i>
1997-1998	<i>Analytical Biochemistry</i>
1997-2009	<i>Nature</i>
1997-2010	<i>Nucleic Acids Research</i>
1999-2010	<i>Nature Genetics</i>
1999-2009	<i>EMBO Reports</i>
1999-2010	<i>Nature Biotechnology</i>
1999-2010	<i>Science</i>
2000-2010	<i>Bioinformatics</i>
2000-2009	<i>Journal of Theoretical Biology</i>
2000-2009	<i>Mammalian Genomics</i>
2000-2006	<i>Gene</i>
2000-2010	<i>BMC Genomics, BMC Bioinformatics</i>
2001-2009	<i>Structural and Functional Genomics</i>
2001-2010	<i>Nature Reviews Genetics</i>
2001-2006	<i>American Journal of Applied Statistics</i>

Editorial Boards:

2000-2006	Editorial Board	<i>Genomics</i>
2006-present	Editor-in-Chief	<i>Genomics</i>
2000-2009	Editorial Board	<i>BioTechniques</i>
2000-2012	Associate Editor	<i>Bioinformatics</i>
2000-present	Editorial Board	<i>BMC Genomics</i>

Awards and Honors:

1985 - 1991	Outstanding Teaching Award (7) , UCLA Physics Department
1986	Jun John Sakurai Scholarship , 24 th International School of Subnuclear Physics, Ettore Majorana Centre for Scientific Culture, Erice, Italy
1987	UCLA Distinguished Teaching Assistant Award , UCLA Academic Senate
1987	Prize for Best Student and Prize for Best Scientific Secretary , 25 th International School of Subnuclear Physics, Ettore Majorana Centre for Scientific Culture, Erice, Italy
1988	Graduate Distinguished Scholar Award , UCLA Alumni Association
1992 - 1997	SERCA Fellow , National Human Genome Research Institute

- 2006 **George D. Wilbanks Lectureship in Gynecological Oncology**,
University of South Florida College of Medicine
- 2007 **President's Distinguished Lectureship**, American Society of
Reproductive Medicine
- 2007 **Leopold G. Koss Lectureship**, Universität Bern, Switzerland
- 2007 **Distinguished International Advisors** at IEE BIBE, the original and the
oldest IEEE flagship international conference in Bioinformatics and
Bioengineering.
- 2008 **Distinguished Lecture in Computer Science**, Wayne State University
- 2010 **IPM Distinguished Lecture**, Mt. Sinai Medical School, New York
- 2010 **The Ian Lawson Van Toch Memorial Seminar Series in
Computational Biology**, Ontario Cancer Institute
- 2010 **Harvard-Australia Foundation Fellowship**
- 2010 **Bancroft Fellow-in-Residence**, Queensland Institute for Medical
Research, Queensland, Australia
- 2010 **Jackson Memorial Fellowship**, Griffith University, Queensland,
Australia
- 2011 **Australia Fellow**, National Health and Medical Research Council,
Australia

Part II: Research, Teaching, and Clinical Contributions

A. Narrative report (500 words or less) of Research, Teaching, and Clinical Contributions. Please focus primarily on the areas in which most of your time and effort is spent.

My current research focuses on the application of genomic technologies and the use of integrative approaches to data analysis to develop an understanding of human diseases, including cancer.

With funding from the National Science Foundation, we build and maintain a series of databases called The Gene Index (TGI) databases that allow us to estimate the gene transcript content of more than 100 eukaryotic species. These databases provide detailed annotation for individual sequences and allow us to link genomic resources such as DNA microarrays between technologies and across species boundaries. The TGI databases receive nearly 150,000 hits per day and are vital for a wide variety of projects relevant to public health and human disease.

Our group also builds and maintains the TM4 suite of open-source software tools for the analysis of DNA microarray data. The most widely used of these, MeV, is a powerful data mining software tool, that places sophisticated analytical tools behind an intuitive graphical user interface. Developed to be accessible to laboratory biologists, MeV has more than 100,000 users worldwide. This project is funded by the National Library of Medicine.

We are also working to create an integrated data warehouse, bringing together information on patient samples, clinical outcome, research data, and data within the public domain in a secure, HIPPA compliant form that only gives access to the relevant data to those with IRB approval. The goals of this data warehouse, funded through an Oracle Commitment grant, are to facilitate discovery by allowing a more comprehensive analysis of genomic signature data and to establish a platform for translational applications.

These resources have been developed to support an active research program in basic and cancer biology. We are currently investigating gene expression in breast cancer using DNA microarrays and methylation profiling to determine whether changes in the “normal” tissue surrounding a tumor exhibit detectable changes that may be useful in developing diagnostics. This work has also allowed us to begin to investigate the relationship between angiogenesis and breast tumor development and we have identified a number of signaling and differentiation pathways that may contain therapeutic targets. We have also recently begun a program in analysis of ovarian cancer with the goal of using mRNA and miRNA expression profiling to understand the problem of chemotherapy resistance. Preliminary data suggests a potential role for copper ion transporters in establishing resistance to platinum therapy.

We are also working to develop predictive network models describing gene interactions in human cells. We have recently developed a seeded Bayesian Network approach that

uses information from the literature and DNA microarray data to understand the manner in which gene networks respond to external stimuli; we are currently validating this approach using RNA interference screening and network prediction in an iterative fashion. Additionally, we are investigating the role stochastic processes play in biological networks and their effects on the models we can build. To that end, and working in collaboration with Dr. Christine Wells of Griffith University in Brisbane, Queensland, Australia, we have begun to explore gene expression state space models that combine aspects of Conrad Waddington's epigenetic landscape approaches with Stuart Kauffman's model of cells as complex adaptive systems and a methods derived from quantum field theory in physics to model cell fate transitions in gene expression "state space."

Finally, I have developed and taught a survey course entitled "Genomics and Bioinformatics for Human Research" at HSPH starting in spring 2009.

B. Funding Information (for research applications since 2005)

2005-2008	NIH	Co-PI	Screening for Breast Cancer Using Molecular Signatures-Subcontract: from H. Lee Moffitt Cancer Center
2006-2011	NSF	PI	Reconstruction and Annotation of Transcribed Sequences in Plants
2006-2010	NIH/NLM	PI	TM4: Software for High-Dimensional Analysis
2006-2008	NIDDK	Co-PI	Linkage Analysis in Interstitial subcontract: from Children's Hospital
2006-2008	Oracle	PI	Integrating Research and Clinical Data to drive discovery
2006-2011	NIH	Co-PI	Paracrine TGF-Beta Signaling in Tumor I Initiation and Progression: Genomics & Bioinformatics Core
2007-2011	NIH/NHGRI	Co-PI	Center of Excellence in Genomic Sciences (CEGS): Genomic Analysis of Network Perturbations in Human Disease
2007-2010	DFCI	Co-PI	Ovarian Cancer Genomic Project Women's Cancer
2008-2011	DFCI	PI	Claudia Adams Barr Foundation Award
2009-2011	NIH	PI	Integrated approaches to deriving predictive networks from public data sources
2009-2011	NIH	Co-PI	Lung Genomics Research Consortium
2010-2015	NIH	Co-I	Discovery, Biology and Risk of Inherited Variants in Breast Cancer
2010	NIH	PI	Illumina Genome Analyzer IIx "Next Generation" DNA Sequencer
2010-2015	NIH	Co-PI	Joint Interdisciplinary Training Program in Biostatistics & Computational Biology

C. Report of Current Research Activities other than those mentioned above (bench research, clinical trials, outcome studies, efficacy studies as applicable)

None to report.

D. Report of Teaching (use only those categories that are applicable)

- 1983 - 1990 Teaching Fellow, Department of Physics, University of California, Los Angeles
- 1984 - 1996 Physics Instructor, Southern California Science Institute, New College of California
- 1987 - 1992 Visiting Lecturer, Department of Physics, University of California, Los Angeles
- 1998 - 2005 Lecturer, The Johns Hopkins University
Instructor in the Masters in Biotechnology Program
- 2000 - 2005 Professor, Department of Biochemistry, The George Washington University
- 2003 - 2005 Adjunct Professor, Department of Biostatistics, Bloomberg School of Public Health, The Johns Hopkins University
Developed program in genomics and bioinformatics; instructor in various courses.

E. Report of Clinical Activities

1. Description of clinical practice (field, areas of major focus, site(s) of practice [private office, HMO, teaching hospital etc.]

None

2. Patient load (indicate complexity of cases, as appropriate)

None

3. Clinical contributions (e.g., introduction of new methods of clinical diagnosis, prevention, treatment, care delivery)

None

4. Other relevant information about clinical role (receipt of clinical awards, locally or nationally, invitation to participate in clinical activities at other sites, special recognition by peers or professional organizations as a leader in a clinical field)

None

Part III: Format for Bibliography**Original Articles**

1. **Quackenbush J.** Chiral anomalies in two-dimensional quantum field theory. *Physical review D: Particles and fields.* 1989;40(10):3408-14. Epub 1989/11/15. PubMed PMID: 10011709.
2. **Quackenbush J.** Twisted world-sheet gauge fields and string models *Phys Lett B.* 1990;234(3):285-91.
3. Buchanan CD, Cousins R, Dib C, Peccei RD, **Quackenbush J.** Testing CP and CPT violation in the neutral kaon system at a phi factory. *Physical review D: Particles and fields.* 1992;45(11):4088-107. Epub 1992/06/01. PubMed PMID: 10014315.
4. Geer S, Marriner J, Ray R, Streets J, Lindgren M, Muller T, **Quackenbush J,** Armstrong T. Search for antiproton decay at the Fermilab antiproton accumulator. *Physical review letters.* 1994;72(11):1596-9. Epub 1994/03/14. PubMed PMID: 10055652.
5. Khristich JV, Bailis J, Diggle K, Rodkins A, Romo A, **Quackenbush J,** Evans GA. Large-scale screening of yeast artificial chromosome libraries using PCR. *BioTechniques.* 1994;17(3):498-501. Epub 1994/09/01. PubMed PMID: 7818903.
6. **Quackenbush J.** Career issues. *Science.* 1994;266(5189):1306. Epub 1994/11/25. doi: 10.1126/science.266.5189.1306. PubMed PMID: 17772824.
7. Selleri L, Giovannini M, Hermanson GG, Romo A, **Quackenbush J,** Penny L, Khristich JV, Evans GA. Yeast artificial chromosome cloning of 3.2 megabases within chromosomal band 11q24 closely linking c-ets 1 and Fli-1 and encompassing the Ewing sarcoma breakpoint. *Genomics.* 1994;22(1):137-47. Epub 1994/07/01. doi: 10.1006/geno.1994.1354. PubMed PMID: 7959760.
8. Kupfer K, Smith MW, **Quackenbush J,** Evans GA. Physical mapping of complex genomes by sampled sequencing: a theoretical analysis. *Genomics.* 1995;27(1):90-100. Epub 1995/05/01. doi: 10.1006/geno.1995.1010. PubMed PMID: 7665188.
9. **Quackenbush J,** Davies C, Bailis JM, Khristich JV, Diggle K, Marchuck Y, Tobin J, Clark SP, Rodkins A, Marcano S, et al. An STS content map of human chromosome 11: localization of 910 YAC clones and 109 islands. *Genomics.* 1995;29(2):512-25. Epub 1995/09/20. PubMed PMID: 8666402.
10. Schuler GD, Boguski MS, Stewart EA, Stein LD, Gyapay G, Rice K, White RE, Rodriguez-Tome P, Aggarwal A, Bajorek E, Bentolila S, Birren BB, Butler A, Castle AB, Chiannikulchai N, Chu A, Clee C, Cowles S, Day PJ, Dibling T, Drouot N, Dunham I, Duprat S, East C, Edwards C, Fan JB, Fang N, Fizames C, Garrett C, Green L, Hadley D, Harris M, Harrison P, Brady S, Hicks A, Holloway E, Hui L, Hussain S, Louis-Dit-Sully C, Ma J, MacGilvery A, Mader C, Maratukulam A, Matisse TC, McKusick KB, Morissette J, Mungall A, Muselet D, Nusbaum HC, Page DC, Peck A, Perkins S, Piercy M, Qin F, **Quackenbush J,** Ranby S, Reif T, Rozen S, Sanders C, She X, Silva J, Slonim DK, Soderlund C, Sun WL, Tabar P, Thangarajah T, Vega-Czarny N, Vollrath D, Voyticky S, Wilmer T, Wu X, Adams MD, Auffray C, Walter NA, Brandon R, Dehejia A, Goodfellow PN, Houlgatte R, Hudson JR, Jr., Ide SE, Iorio KR, Lee WY, Seki N, Nagase T, Ishikawa K, Nomura N, Phillips C, Polymeropoulos MH, Sandusky M, Schmitt K, Berry R, Swanson K, Torres R, Venter JC, Sikela JM, Beckmann JS, Weissenbach J, Myers RM, Cox DR, James MR, Bentley D, Deloukas P, Lander ES, Hudson TJ. A gene map of the human

- genome. *Science*. 1996;274(5287):540-6. Epub 1996/10/25. PubMed PMID: 8849440.
11. Doyle DJ, **Quackenbush J**. Symposium on Genomic Medicine, University of Maryland, Shady Grove Campus, Rockville, Maryland, March 17-18, 1997. *Microbial & comparative genomics*. 1997;2(2):99-102. Epub 1997/01/01. PubMed PMID: 9689218.
 12. Fraser CM, Casjens S, Huang WM, Sutton GG, Clayton R, Lathigra R, White O, Ketchum KA, Dodson R, Hickey EK, Gwinn M, Dougherty B, Tomb JF, Fleischmann RD, Richardson D, Peterson J, Kerlavage AR, **Quackenbush J**, Salzberg S, Hanson M, van Vugt R, Palmer N, Adams MD, Gocayne J, Weidman J, Utterback T, Wathley L, McDonald L, Artiach P, Bowman C, Garland S, Fuji C, Cotton MD, Horst K, Roberts K, Hatch B, Smith HO, Venter JC. Genomic sequence of a Lyme disease spirochaete, *Borrelia burgdorferi*. *Nature*. 1997;390(6660):580-6. Epub 1997/12/24. doi: 10.1038/37551. PubMed PMID: 9403685.
 13. Klenk HP, Clayton RA, Tomb JF, White O, Nelson KE, Ketchum KA, Dodson RJ, Gwinn M, Hickey EK, Peterson JD, Richardson DL, Kerlavage AR, Graham DE, Kyrpides NC, Fleischmann RD, **Quackenbush J**, Lee NH, Sutton GG, Gill S, Kirkness EF, Dougherty BA, McKenney K, Adams MD, Loftus B, Peterson S, Reich CI, McNeil LK, Badger JH, Glodek A, Zhou L, Overbeek R, Gocayne JD, Weidman JF, McDonald L, Utterback T, Cotton MD, Spriggs T, Artiach P, Kaine BP, Sykes SM, Sadow PW, D'Andrea KP, Bowman C, Fujii C, Garland SA, Mason TM, Olsen GJ, Fraser CM, Smith HO, Woese CR, Venter JC. The complete genome sequence of the hyperthermophilic, sulphate-reducing archaeon *Archaeoglobus fulgidus*. *Nature*. 1997;390(6658):364-70. Epub 1997/12/06. doi: 10.1038/37052. PubMed PMID: 9389475.
 14. Korenberg JR, Aaltonen J, Brahe C, Cabin D, Creau N, Delabar JM, Doering J, Gardiner K, Hubert RS, Ives J, Kessling A, Kudoh J, Lafreniere R, Murakami Y, Ohira M, Ohki M, Patterson D, Potier MC, **Quackenbush J**, Reeves RH, Sakaki Y, Shimizu N, Soeda E, Van Broeckhoven C, Yaspo ML. Report and abstracts of the Sixth International Workshop on Human Chromosome 21 Mapping 1996. Cold Spring Harbor, New York, USA. May 6-8, 1996. *Cytogenetics and cell genetics*. 1997;79(1-2):21-52. Epub 1997/01/01. PubMed PMID: 9533011.
 15. Stewart EA, McKusick KB, Aggarwal A, Bajorek E, Brady S, Chu A, Fang N, Hadley D, Harris M, Hussain S, Lee R, Maratukulam A, O'Connor K, Perkins S, Piercy M, Qin F, Reif T, Sanders C, She X, Sun WL, Tabar P, Voyticky S, Cowles S, Fan JB, Mader C, **Quackenbush J**, Myers RM, Cox DR. An STS-based radiation hybrid map of the human genome. *Genome research*. 1997;7(5):422-33. Epub 1997/05/01. PubMed PMID: 9149939.
 16. Tomb JF, White O, Kerlavage AR, Clayton RA, Sutton GG, Fleischmann RD, Ketchum KA, Klenk HP, Gill S, Dougherty BA, Nelson K, **Quackenbush J**, Zhou L, Kirkness EF, Peterson S, Loftus B, Richardson D, Dodson R, Khalak HG, Glodek A, McKenney K, Fitzegerald LM, Lee N, Adams MD, Hickey EK, Berg DE, Gocayne JD, Utterback TR, Peterson JD, Kelley JM, Cotton MD, Weidman JM, Fujii C, Bowman C, Wathley L, Wallin E, Hayes WS, Borodovsky M, Karp PD, Smith HO, Fraser CM, Venter JC. The complete genome sequence of the gastric pathogen *Helicobacter pylori*. *Nature*. 1997;388(6642):539-47. Epub 1997/08/07. doi: 10.1038/41483. PubMed PMID: 9252185.

17. Quackenbush BM, Donly KJ, Croll TP. Solubility of a resin-modified glass ionomer cement. *ASDC journal of dentistry for children*. 1998;65(5):310-2, 54. Epub 1998/10/31. PubMed PMID: 9795733.
18. Arabidopsis Genome Initiative (**John Quackenbush** was a major contributor to this consortium project). Analysis of the genome sequence of the flowering plant *Arabidopsis thaliana*. *Nature*. 2000;408:796-815.
19. El-Sayed NM, Hegde P, **Quackenbush J**, Melville SE, Donelson JE. The African trypanosome genome. *International journal for parasitology*. 2000;30(4):329-45. Epub 2000/03/25. PubMed PMID: 10731558.
20. Hegde P, Qi R, Abernathy K, Gay C, Dharap S, Gaspard R, Hughes JE, Snesrud E, Lee N, **Quackenbush J**. A concise guide to cDNA microarray analysis. *BioTechniques*. 2000;29(3):548-50, 52-4, 56 passim. Epub 2000/09/21. PubMed PMID: 10997270.
21. Liang F, Holt I, Pertea G, Karamycheva S, Salzberg SL, **Quackenbush J**. An optimized protocol for analysis of EST sequences. *Nucleic acids research*. 2000;28(18):3657-65. Epub 2000/09/13. PubMed PMID: 10982889; PubMed Central PMCID: PMC110731.
22. Liang F, Holt I, Pertea G, Karamycheva S, Salzberg SL, **Quackenbush J**. Gene index analysis of the human genome estimates approximately 120,000 genes. *Nature genetics*. 2000;25(2):239-40. Epub 2000/06/03. doi: 10.1038/76126. PubMed PMID: 10835646.
23. **Quackenbush J**. Viva la revolution! A report from the FANTOM meeting. *Nature genetics*. 2000;26(3):255-6. Epub 2000/11/04. doi: 10.1038/81525. PubMed PMID: 11062453.
24. **Quackenbush J**, Liang F, Holt I, Pertea G, Upton J. The TIGR gene indices: reconstruction and representation of expressed gene sequences. *Nucleic acids research*. 2000;28(1):141-5. Epub 1999/12/11. PubMed PMID: 10592205; PubMed Central PMCID: PMC102391.
25. Yuan Q, Liang F, Hsiao J, Zismann V, Benito MI, **Quackenbush J**, Wing R, Buell R. Anchoring of rice BAC clones to the rice genetic map in silico. *Nucleic acids research*. 2000;28(18):3636-41. Epub 2000/09/13. PubMed PMID: 10982886; PubMed Central PMCID: PMC110739.
26. Brazma A, Hingamp P, **Quackenbush J**, Sherlock G, Spellman P, Stoeckert C, Aach J, Ansorge W, Ball CA, Causton HC, Gaasterland T, Glenisson P, Holstege FC, Kim IF, Markowitz V, Matese JC, Parkinson H, Robinson A, Sarkans U, Schulze-Kremer S, Stewart J, Taylor R, Vilo J, Vingron M. Minimum information about a microarray experiment (MIAME)-toward standards for microarray data. *Nature genetics*. 2001;29(4):365-71. Epub 2001/12/01. doi: 10.1038/ng1201-365. PubMed PMID: 11726920.
27. Flores-Morales A, Stahlberg N, Tollet-Egnell P, Lundeberg J, Malek RL, **Quackenbush J**, Lee NH, Norstedt G. Microarray analysis of the in vivo effects of hypophysectomy and growth hormone treatment on gene expression in the rat. *Endocrinology*. 2001;142(7):3163-76. Epub 2001/06/21. PubMed PMID: 11416039.
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Educational Material: I have taught numerous courses and workshops and make the materials freely available. Material from recent courses on Microarray Data Analysis can be found at <http://compbio.dfc.harvard.edu>

Thesis: Gauge Field Theory in Two Space-Time Dimensions: Anomalies and Applications to String Models.

Nonprint Materials, i.e., film strips, films, videotapes and computer-based materials relevant to appointee's academic field. *Include description of item, who commissioned, purpose, users, penetration in field.*

Patents

Abstracts (*only those containing data not yet published in complete form.*)