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Education

B.A. 1991 Biology, University of California at Santa Cruz, CA
Ph.D. 1997 Cell and Developmental Biology, Sackler School, Tufts University, Boston, MA

Postdoctoral Training

1997-1998 Research Fellow, Department of Pathology, Harvard University, Boston, MA
1997-1998 Research Fellow, Cancer Biology, Dana Farber Cancer Institute, Boston, MA

Current Positions

2013-present Adjunct, Associate Research Professor, Mathematical,Computational and Modeling Science Center, Arizona State University, Phoenix, AZ
2013-present Faculty, East Side Institute, New York, New York.
2010-present Founder and Director, improvscience, Boston, MA
2000-present Research Assistant Professor, Center for Computational Science, Boston University, Boston, MA

Previous Positions

2007-2013 Assistant Professor in Residence, Department of Cell Biology, UCHC, Farmington, CT
2010-2013 Director of Outreach, Recruitment and Retention, CCAM, UCHC.
2005-2007 Recruitment Consultant, Center for Cellular Analysis and Modeling, UCHC, Farmington, CT
2003-2008 Director of Development, Boston All Stars, Boston, MA
2005 Visiting Assistant Professor, BEDROCK Project and Biology Department, Beloit College, WI
1998-2005 Program Manager, EOT-PACI, Center for Computational Science, Boston University, Boston, MA
2001-2003 Financial Director, Institute for African-American E-culture, Inc.
1998-2000 Coordinator of Recruitment and Retention, Bioinformatics Graduate Program, Boston University, Boston, MA

Certificates

Certificate in Social Therapeutics. East Side Institute for Group and Short Term Psychotherapy. New York, NY 1998

Publications

Landau, R., Holmes, R.M., Kwang, N.H., Mulder, G., Borinskaya, S., and Bordeianu, C. (July, 2013) "INSTANCES: Incorporating Computational Scientific Thinking Advances into Education & Science Courses." XSEDE13 Special Issue Journal Concurrency and Computation: Practice and Experience. http://dl.acm.org/citation.cfm?doid=2484762.2484769

Crivelli, S., Dooley, R., Holmes, R. and Mock, S. (submitted, 2013) "Creating a Gateway that Enables Large-Scale Science Coopetition." Concurrency and Computation: Practice and Experience.

Loew, L.M., Holmes, R.M, Brown, S.A. 2012. Spatial organization and diffusion in neuronal signaling, in Computational Systems Neurobiology, N. Le Novere ed. Springer

Hug, S. & Holmes, R. 2012. "Cultivating new discursive practice in science: Improvisation as professional vision." Proceedings of the American Educational Research Association, Vancouver, B.C.

Holmes, R.M., 2011. “Improvisational Theater for Computing Scientists” Proceedings of C&C’11, Atlanta, Georgia, USA. ACM 978-1-4503-0820-5/11/11

Holmes, R.M. 2010. “Phyiscal biology of the cell: Physics in a beautiful context” CBE Life Sci Educ 9(3): 154-156. DOI: 10.1187/cbe.10-06-0080)

Levin M.K., Hingorani M.H., Holmes R.M., Patel S.S., Carson J.H. 2009. "Model-based global analysis of heterogeneous experimental data using gfit" in Methods in Molecular Biology/Systems Biology, I.V. Maly, ed., Humana Press, Inc.

Holmes R. M. and Loew L.M. 2008. "Geometry Shapes Cell Signaling Network Output" Chemistry & Biology, June, 2008 doi:10.1016/j.physletb.2003.10.071

Holmes R.M. 2007. A Cell Biologist’s Guide to Modeling and Bioinformatics. John Wiley & Sons. New York

Holmes R. M. and Qureshi M.M. 2006. “Performing as Scientists: an improvisational approach to student research and faculty collaboration” BioScene, March 2006

Holmes R. M. 2006. “Visiting Faculty at Beloit College: Learning new performances” BioQUEST Notes, Summer 2006

Holmes R. and Giles R. 2000. “Minority Participation in Computational Science.” Computing in Science & Engineering, March/April 2000, p 11-13.

Holmes R.M., Cuhna M.J. and Albertini D.F. 1997. “Cytoskeleton-mediated aspects of signal transduction,” in Cell Structure and Signaling. Editor, Getzenberg R.H. in: Advances in Molecular and Cell Biology, Series Editor, Bittar EE JAI Press Inc. vol 24, p.95-123.

Can A., Holmes R.M. and Albertini D.F. 1997. “Analysis of the mammalian ovary by confocal microscopy,” in Microscopy of Reproduction and Development: A Dynamic Approach, Motta P.M., Editor, p101-108.

Invited Talks

“March on Washington- 50 years later.” Sonoma State University, Rohnert Park, CA. August 2013

“Improvisation: Essential skills in learning and working in computational science.” Lawrence Berkeley National Laboratory, Berkeley, CA July 2012

“Becoming a computational scientist: A qualitative journey to quantitative approaches”, Advance Program, Oakland University, Pittsburgh, MI June 2012

“The Improvisational Art of Collaborative Ensembles in Science”, NGCP National Collaboration Conference: Advancing the Field through Collaboration, Capacity Building and Equity. Washington, D.C. April 2012

“Crossing Silos: A graduate training program in Cell Analysis and Modeling” in Mini Symposium: Innovations in Graduate Education. American Society for Cell Biology, Annual Meeting, Denver, CO December, 2011.

“Why becoming computational biologists involves performing like actors.” Empowering Leadership Alliance, University of Texas Austin, Austin, TX February, 2011

“Broader Engagement: Perspective from SC10” Enabling Broader Engagement and Workforce Development, Community Input on the Future of HPC Workshop Series, Washington DC, Dec. 3 2010

“Computational Cell Biology and the Virtual Cell Simulation Framework,” Georgia Southern University, Savannah, GA February, 2010

“What did the software engineer say to the biologist, chemist, & physicist?” Year of Science Speaker, University Connecticut, Stamford, CT November 3, 2009

“Computing, Biology and Dynamics” Introduction to Computer Science Course, Colby College, April, 2009

“Quantitative models: why do experimentalists use them?” HHMI Visiting Scholar Series, St. Joseph University, Philadelphia, PA 2009

“Modeling the Cell Cycle with the Virtual Cell” Science Collaboratory: Open Participatory Learning, Emory University. Jan 2009

“Leveraging Infrastructure: Promoting Computational Approaches Among Cell Biologists” iPlantCollaborative Molecular Mechanisms Workshop, Tuscon, AZ Nov. 2008

“Teaching Modeling and Quantitative Biology” Education Initiative, American Society for Cell Biology, Washington D.C. 2007

"Successful Education, Outreach and Training: Build Community," GridChem Workshop, April,2005

"Modeling the cell cycle, new skills in undergraduate biology education," Investigating Interdisciplinary Interactions, BioQUEST summer workshop. Beloit College, Beloit, WI. June, 2005.

"Biology Education and Research Includes Technology," National Science Teachers Association, regional meeting. Chicago, IL. November, 2005.

"Computer modeling of cellular processes," Spelman College. Biology Department, 2004

"From Cell Biology to Computational Biology," BioQUEST Workshop, Emory University, Atlanta, GA 2001

"Computational Science: Supporting Research and Education," Long Island University, Brooklyn, NY 2001

"Society, Biology, Computers: Views from a black woman scientist," American Association of University Women, 2001

"People, Technology, People: The Access Network," Alliance Chatauqua, Boston University 2000

"Video-Conference in Research and Education," Distance Learning Center, Boston University 2000

"Computational Science and the Researcher", New England Partners in Scientific Collaboration, Southern Maine Technical College. 1999

"Independence and the African American Community", Young Black Entrepeneurs, Roxbury Community College, Boston, MA. 1996

Abstracts-peer reviewed

Holmes, R. & Hug, S. 2012 "Improvisation: Building and Understanding Environments for Creative Learning." American Society for Cell Biology, San Francisco, CA, December. 2012

Holmes, R.M. and Hug, S. 2011 “Innovative Approach to Developing Computational Cell Biologists.” Computational Cell Biology, March, 2011.

Holmes, R.M. and Hug, S. 2011 “Creativity and culture in computing sciences” Tapia Celebration of Diversity in Computing, San Francisco, April, 2011.

Holmes, R.M. 2010 “Community and Cultural Approaches to Workforce Development.” Workforce Development: SC10, New Orleans, LA

Holmes, R.M. 2010 “Web Accessible Resources For Teaching Quantitative Cell Biology At Undergraduate And Graduate Levels.” 54th Annual Meeting of Biophysical Society, San Francisco, CA.

Ngyuen, B. and Holmes, R.M. 2009 “CompCellBio Web: A Collaborative Resource for Curriculum Development in Mathematical Modeling.” American Society for Cell Biology, 49th Annual Meeting, San Diego, CA.

Holmes, R. M,Cowan, A. E,. Moraru, I. I., Schaff, J., Slepchenko, B. M., Loew L. M. 2008 “Quantitative Biology and Modeling.” American Society for Cell Biology, 48th Annual Meeting, San Francisco, CA

Holmes, R. M,Cowan, A. E,. Moraru, I. I., Schaff, J., Slepchenko, B. M., Loew L. M. 2007 “Teaching Modeling and Quantitative Biology.” American Society for Cell Biology, 47th Annual Meeting, Washington D.C.

Holmes, R.M. 2006 "Workshop Design: Computational Biology for Biologists and Mathematicians." 46th Annual Meeting of American Society for Cell Biology, San Diego, CA.

Holmes, R.M. 2005 "Mathematical modeling of the cell-cycle: a research project in undergraduate cellular, developmental biology." American Society for Cell Biology, 45th Annual Meeting.

Holmes, R.M. 2005. "Developing Faculty-Student Collaborations: An Improvisational Performance." American Society for Cell Biology, 45th Annual Meeting.

Holmes, R.M. 2001 "Technology Development Zones: A Cultural Approach to Technology," Performing the World, Montauk, NY

Holmes R.M. and Albertini D.F. 1996. "Coordinated cadherin and phosphotyrosine expression during murine ovarian follicular development." Biol Reprod 54:189.

Holmes R.M. and Albertini D.F. 1994. "Changes in tyrosine phosphorylation during ovarian follicular development in the mouse." Biol Reprod 50:182.

Holmes R.M. and Albertini D.F. 1994. "Coincident expression of phosphotyrosine and FGFR-1 during ovarian follicular development and differentiation." Mol Biol Cell 5:96a.

Holmes R.M., Messinger S.M. and Albertini D.F. 1993. "Mouse oocyte centrosome MT nucleating capacity is influenced by hormone exposure." Mol Biol Cell 4:27a.

Invited Workshops

“Improvisation for Q-bio” Special session, 7th Annual q-bio, Alburqurque, NM. 2013

“Catalyzing Environments for Discovery: an improvisational process” Extreme Science and Engineering Discovery Environments, XSEDE13, San Diego, CA July 2013

“Improvisation for Scientists” Improvscience Session, Computational Cell Biology Meeting, Cold Spring Harbor Laboratories, March 2013

“Professional Presentations for Scientists.” Communicating Science- Systems Biology Course, Harvard University, Boston, MA November, 2012

“Creating Professional Performances for Scientific Growth.” Creativity, Communication and Collaboration. Computational Science Graduate Fellows Annual Meeting. Arlington, VA. July, 2012

“The practice of building creative collaborations” Center for Systems & Synthetic Biology, University California San Francisco, CA September, 2011

“Improvisation for Scientists” Improvscience Session, Computational Cell Biology Meeting, Cold Spring Harbor Laboratories, March 2011

“A performance-based workshop in building more productive workplace relationships with supervisors and co-workers” Post Doctoral Affairs Office, University of Connecticut Health Center, Farmington, CT February, 2011

“Improvisation for Scientists” Biomedical Sciences Graduate School Orientation, University of Connecticut Health Center, Farmington, CT August, 2012; 2011; 2010

Conference Workshops, Panels, and Talks

Holmes, R.M., Pulford,S., Bautista, E. and Melara, L. “Building a career for you, an improvisational art and practice.” (accepted, Panel) Tapia Celeberation of Diversity in Computing, 2014

Holmes, R.M. "Improvisation at Work in Play: Building Collaborative Communication among Scientists." "Improvisation for Scientists: Making a Human Connection" (accepted, Panel) AAAS, 2014

Holmes, R.M. "Building functional professional relationships." SC12 Broader Engagement Program, Salt Lake City, UT November 2012

Holmes, R.M. "Dynamic biochemical and spatial models: Virtual Cell" SC11 Education Program, Seattle, WA November 2011

Holmes R.M. and Dougherty, E. "Does performing science change science or scientists?" Performing The World Conference, New York, New York October 3, 2010

Holmes, R.M., Hug, S., Clark, A., Martinez, J., and Bresnahan, G. "Community and Cultural Approaches to developing a diverse IT workforce" Special Projects- Workforce Development Track, SC10, New Orleans, Louisiana November 2010

Giles, R.C, Holmes, R.M., Metoyer, R. "What programs really work for students interested in research and computing?" Birds of a Feather, SC09, Portland, OR November 2009

Holmes, R.M., Giles, R.C., Dawson, C.M and Rankins, Y. "What would a conversation of HPC look like if you were in it?" SC08 Broader Engagement Program. Austin, TX. November 2008

Holmes, R.M, Cowan, A.E., Moraru, I.I., Schaff, J., Slepchenko, B.M., Loew L.M. "Quantitative Biology and Modeling." American Society for Cell Biology, 48th Annual Meeting, San Francisco, CA December 2008

Holmes, R.M. Cowan, A. E., Loew L.M. "A Multiscale Education and training Approach to Developing Quantitative Cell Biologists" Biomedical Technology Research Resources and Resource Centers, PI Meeting, Washington, DC Nov, 2008

Holmes, R.M. Holmes, R.M. Cowan, A. E., Loew L.M. "Bringing new technologies to biology education and research communities," Technology Centers for Networks and Pathways All Hands Meeting, Washington D.C. 2007

Holmes, R.M., Cowan, A. E., Moraru, I.I., Schaff, J., Slepchenko, B. M., Loew L. M. "Teaching Modeling and Quantitative Biology." American Society for Cell Biology, 47th Annual Meeting December 2007

Fass, M., Holmes, R.M., and Johnson C. "Transforming hiv/aids through dance: a sociocultural and biological exploration." Performing the World conference. Tarrytown, NY October 2005

Holmes, R.M. "Computational Biosciences," Mini Session, SC Global, SC01, Denver, CO November 2001

Holmes, R.M. "Technology Development Zones: A Cultural Approach to Technology," Performing the World, Montauk, NY October 2001

Holmes, R.M. and Grisham, L. "Wanted System Thinkers: For exciting science opportunities," Creative Learning Exchange, Skamania, WA 2000

Holmes, R.M. "Computational Science, Education and Research: Filling the Gaps," SIAM, Conference on Computational Science, Washington D.C. 2000

Funding Support

Pending NSF Computing, Information Sciences and Engineering
PI, Improvisational Ensembles in Science

2011-2013 NSF Division of Undergraduate Education
Co-PI, Collaborative Incorporating Computational Scientific Thinking into Education and Science Courses

2010-2012 NSF Computing, Information Sciences and Engineering
PI, Pilot-Improvisational Theatre for Computing Scientists

2010-2013 NSF Computing, Information Sciences and Engineering

PI, BPC-LSA Beyond Broader Engagement At SC

2006-2007 NSF Computing, Information Sciences and Engineering
PI, Advanced Computing for Cell Biology

Community Education and Outreach

Workshops, "Introduction to Improvisational Theater for scientists" Harvard University, Systems Biology, Boston, MA 2010

Workshops, "Introduction to Improvisational Theater for scientists" University of Connecticut Health Center, Center for Cell Analysis and Modeling, Farmington, CT 2010

Volunteer, Boston All Stars, Boston, MA 2010

Course Instructor, "What does performance have to do with emotional growth?" Revolutionary Conversations Series on Social Therapeutics of Newman & Holzman, Boston Social Therapy Group, Boston, MA.

Course Instructor, "Performing Science: Can we create environments of transformation and discovery? Revolutionary Conversations Series on Social Therapeutics of Newman & Holzman, Boston Social Therapy Group, Boston, MA.

Workshop, "Experimental Workshops in Improvisation for Scientists." Harvard University, Systems Biology, Boston, MA 2009

Science Fair Judge, Boston Arts Academy, Boston, MA 2005-2007

Professional Service

2013-present	Broadening Participation in Data Mining, Steering Committee
2013-present	CSGF Communicate your science and engineering competition, Judge
2012-present	XSEDE, Minority Faculty Council
2002-present	National Computational Science Institute, Advisory Committee
1999-present	BioQUEST Library, BioQUEST Curriculum Consortium, Beloit College, Beloit, WI: Review Editor.
2009-present	Organizer, New England Undergraduate Computing Symposium 2009, 2010, 2011
2011-2012	Member, SC12 Broader Engagement Committee
2002-2012	National Science Foundation, Review Panels CISE, BIO
2011	Member, SC11 Education and Broader Engagement Committees
2008-2010	Chair, Broader Engagement Committee, SC10
2004-2007	Gridchem, Advisory Board
2003-2007	Cell Biology Education Journal, ASCB: Editorial Board member
2001-2007	institute for African American e-Culture, Member
2000-2004	Education Committee, American Society for Cell Biology: Liaison
2000-2004	Minority Affairs Committee, American Society for Cell Biology
2001-2002	Coalition to Diversify Computing, member
2001	Department of Commerce, Telecommunication Opportunities Program, Review Panel
2001	Tapia Symposium: Celebration of Diversity in Computing, Poster Chair
1999-2001	Committee of the NE Alliance for Minority Graduate Education, Boston University, Boston, MA
1999-2000	Admissions Committee, Bioinformatics Graduate Program, Boston University, Boston, MA

Awards

1998	Fred Newman Scholarship Fund, East Side Center for Short Term Psychotherapy, NY, NY
1997-1998	National Research Service Award (NRSA), NIH.
1991-1996	Minority Access to Research Careers (MARC), Pre-doctoral Fellow, NIH

1993 Marine Biological Laboratories (MBL) Porter Foundation Scholarship
1993 MBL American Society for Cell Biology
1989-1991 Minority Access to Research Careers (MARC)- NRSA, NIH

Professional Societies
1992- present American Society for Cell Biology
2007- present BioPhysical Society
2010- present Association of Computing Machinery
1999- 2005 Institute of Electrical and Electronic Engineers (IEEE)

Collaborators and Other Affiliations (past 3 years)
Roscoe Giles, Boston University, Boston, MA; Claudio Rebbi, Boston University, Boston, MA; Leslie M. Loew, University of Connecticut Health Center, Farmington, CT; Ann Cowan, University of Connecticut Health Center, Farmington, CT; James Schaff, University of Connecticut Health Center, Farmington, CT; Rubin Landau, Oregon State University, Corvalis, OR; Richard Tapia, Rice University; Ruzena Bajcsy, University California Berkeley; Clint Dawson, University of Texas at Austin; Lecia Barker, University of Texas at Austin; Jose Cossa, University of Texas at Austin; Juan Gilbert, Clemson University; Phoebe Lenear, University of Illinois; Sarah Hug, University of Colorado Boulder.

Graduate Advisor, David Albertini, University of Kansas Medical Center
Postdoctoral Advisor, Lan Bo Chen, Dana Farber Cancer Institute, Boston, MA

Students
Jina Kim, Masters Thesis, Biology (2003)