

JUSTINE D. MILLER

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PROFILE

- Areas of Interest:** Basic and translational human embryonic stem cell (hESC) biology; Disease modeling; Regenerative medicine and cell therapy; Reprogramming and disease-specific induced pluripotent stem (iPS) cell biology
- Publications:**
- Agarwal S, Cherry ABC, McLoughlin EM, Lerou PH, **Miller JD**, Huo H, Hartung O, Zon RL, Fleming MD, Ince TA, Neufeld EJ, Daley GQ. Derivation of disease-free induced pluripotent stem cells from patients with mitochondrial disorders. *Science*, submitted.
- Agarwal S, Loh YH, McLoughlin EM, Huang J, Park IH, **Miller JD**, Huo H, Okuka M, dos Reis RM, Loewer S, Ng HH, Keefe DL, Goldman FD, Klingelutz AJ, Liu L, Daley GQ (2010). Telomere elongation in dyskeratosis congenital induced pluripotent stem cells. *Nature* **464**(7286):292-6.
- Tulpule A, **Miller J**, Lensch MW, Austin K, D'Andrea A, Shimamura A, Daley GQ. (2010). Knockdown of Fanconi anemia genes in human embryonic stem cells reveals early developmental defects in the hematopoietic lineage. *Blood*; in press.
- Doi A, Park IH, Wen B, Murakami P, Irizarry RA, Herb BR, Schmitt S, Rho J, **Miller J**, Schlaeger TM, Daley GQ, Feinberg AP. (2009). Differential methylation of tissue- and cancer-specific CpG island shores distinguishes human induced pluripotent stem cells, embryonic stem cells and fibroblasts. *Nat Genet* **41**(12):1350-3.
- Chan EM, Ratanasirintrawoot S, Park IH, Manos PD, Loh YH, Huo H, **Miller JD**, Hartung O, Rho J, Ince TA, Daley GQ, Schlaeger TM. Live cell imaging distinguishes bona fide human iPS cells from partially reprogrammed states. *Nature Biotech* **27**(11):1033-7.
- Loh YH, Agarwal S, Park IH, Urbach A, Huo H, Heffner GC, Kim K, **Miller JD**, Ng K, Daley GQ. (2009). Generation of induced pluripotent stem cells from human blood. *Blood*; 113(22):5476-9.
- Lerou PH, Yabuuchi A, Huo H, **Miller JD**, Boyer LF, Schlaeger TM, and Daley GQ. (2008). Derivation and maintenance of human embryonic stem cells from poor-quality *in vitro* fertilization embryos, *Nature Protocols* **3**, 923–33.

RESEARCH/WORK EXPERIENCE

- Harvard Stem Cell Institute's (HSCI) hESC Core Facility**, Children's Hospital Boston June 2007-present
- Research Technician*
- Derive and characterize patient-specific iPS cell lines
 - Differentiate hESCs towards hematopoietic stem cells and blood progenitors
 - Develop and optimize methods for ease and maintenance of both presidential and non-presidential hESC cultures in feeder-dependent and feeder-independent conditions while retaining genetic stability
 - Provide expertise in hESC culture techniques to scientists of the hESC community
 - Direct, manage, and teach a 4-day course on basic hESC maintenance and culture to HSCI technicians, students, and fellows
 - Expand and perform quality control on non-presidential hESC lines and iPS cell lines for the HSCI stem cell bank
 - Evaluate new products for hESC maintenance and culture
 - Attend and participate in weekly lab meetings with George Q. Daley's lab, floor meetings with the Stem Cell Program at Children's, and the HSCI Journal Club
- Projects*
- Establishing a stable hESC model of Faconi anemia
 - Defining and characterizing partially reprogrammed human iPS cells by live cell imaging

RESEARCH/WORK EXPERIENCE (cont'd)

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- Genetics Laboratory**, Connecticut College Spring 2007
Teaching Assistant • Taught evening laboratory sessions for extended labs
- Deletion mapping of a flightless mutant in *Drosophila melanogaster***, Connecticut College Spring 2006, Fall 2006
Independent Study • Mapped and identified novel gene
• Wrote full research paper
- FBI Laboratory**, Latent Print Unit, Quantico, Virginia Summer 2006
Honors Intern • Led and organized top security projects designed to assess problems with latent print visualization
• Studied and discerned the mechanism driving latent print visualization by Physical Developer
• Contributed to three full research papers; Presented research to unit
- HIV-resistant hematopoietic stem cells as a therapeutic approach to fighting AIDS**, Connecticut College Spring 2006
Student • Course: Frontiers in Molecular Biology
• Attended seminars on cutting edge biomedical technologies presented by Pfizer scientists
• Developed a drug discovery approach to finding the gene(s) responsible for conferring HIV-resistance in hematopoietic stem cells
• Wrote proposal for final project that was assessed by Pfizer scientists
- Creation of a glutathione-S-transferase fusion protein and expression in *E. coli***, King's College Fall 2005
Student Researcher • Course: Practical Techniques in Molecular Genetics
• Cloned and protein purified the *Arabidopsis thaliana* protein *pac3* into the expression vector pGEX-2T
• Composed full research paper
- Isomerization of 1,1,2-trimethylcyclopropane**, Physical Chemistry, Connecticut College Summer 2004
Research Assistant • Designed and performed experiments to assess the kinetic parameters of the isomerization of a cyclopropane derivative using a single-pulse shock tube reactor
• Composed full research paper

EDUCATION & HONORS

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- CONNECTICUT COLLEGE**, New London, Connecticut BA *summa cum laude* May 2007
Major: Biochemistry, Cellular and Molecular Biology GPA 3.85
Minor: Music
Honors: • Phi Beta Kappa 2007
• Dean's Honors/High Honors all semesters
• The American Institute of Chemists Foundation and the New England Institute of Chemists Outstanding Student in Biochemistry Award 2007
• Winthrop Scholar (college's highest academic honor) for early induction into Phi Beta Kappa 2006
• Sibyl A. Hausman Prize for Excellence in Biology Award 2006
• American Chemical Society Division of Analytical Chemistry Award 2006
• Goldwater Scholarship Nomination 2005
• Chemical Rubber Company Freshman Chemistry Achievement Award 2004
- KING'S COLLEGE LONDON**, *Study Abroad Program*, London, England Fall 2005
- OGLETHORPE COLLEGE**, *Summer Session: Physics*, Atlanta, Georgia Summer 2005