Kyle J. Hill

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Education:

University of Missouri, Columbia — **September 2011 – Present**
PhD in **Molecular Microbiology and Immunology** – *In Progress*
Certificate in **Life Sciences Innovation and Entrepreneurship**

University of California, Irvine — **September 2004 – June 2008**
B.S. in **Biological Sciences**

Research Experience:

Doctoral Candidate, Dr. Donald H. Burke — **March 2012 – Present**
- Biochemical characterization of RNA aptamers selected to bind to small molecules and proteins
- Utilize cell culture and molecular techniques in the identification of RNA aptamers which package preferentially into budding virion.
- Appropriate the viral packaging mechanisms in order to 'piggy-back' our labs anti-HIV aptamers in an in-vivo mouse model.

Research Assistant, Dr. Anthony A. James — **2006 – 2008**
- Basic update and maintenance on lab webpage http://www.angaged.bio.uci.edu/
- Attempted to identify conserved promoter motifs within the *Anopheles gambiae* genome.
- Utilized RNA isolation techniques including 5'RACE Reactions, PCRs, and cloning of samples for sequencing and computational analysis.
- Explored and applied a variety of bio-informatics tools in the analysis of DNA promoter regions including Hidden Markov Models and PRISM Training.

Research Assistant, Dr. Brandon S. Gaut — **2005 – 2006**
- Created web interface for published Transposable Elements research data using MySQL, HTML, and PHP.
- Developed undergraduate research project to expound the significance of transposable elements in the protein coding regions of *Oryza sativa* (rice).
- Used PERL and Python in a UNIX environment to accomplish research related tasks.

Lab Assistant, Dr. Alan Barbour — **2004 – 2005**
- Maintain high lab cleanliness and efficiency by autoclaving and preparing equipment and solutions.
- Conducted monthly and weekly tasks to support lab employees including preparing plates.
- Maintained inventory and ordered necessary products as needed.

Industry Experience:

Certified Technologist/Trainer, National Genetics Institute — **July 2008 – June 2011**
- Contribute to the conclusive identification of pathogen infected blood samples.
- Uphold the criteria and values set forth by our in-house SOPs and FDA oversight GMP/GLP.
- Practice safe laboratory procedures in a clean environment with potentially hazardous samples.
- Operate specially designed equipment in all processing steps including Thermocycling, Electrophoresis, Southern Blotting, Hybridization/Immunostaining, Development, and Results Interpretation
- Pursue ongoing training in our Research and Results Interpretation departments.

Posters and Presentations:

Spring Undergraduate Research & Creative Achievements Forum (Judge) April 21, 2015

"Combinatorial Aptamer Transcripts (CATs) for HIV RT Suppression" (Poster) Missouri Life Sciences Week. April 13-17, 2015

"Viral Hitchhiking to Increase Therapeutic Potential: Autonomously Packaged Elements (APEs)" (Poster) Missouri Life Sciences Week. April 13-17, 2015

"Herding CATs: Combinatorial Aptamer Transcripts Improve HIV-1 Suppression" (Poster) Missouri Life Sciences Week. April 14-18, 2014

"Herding CATs: Combinatorial Aptamer Transcripts Improve HIV-1 Suppression" (Poster) 9Th International Retroviral Nucleocapsid Protein and Assembly Symposium. August 25-28, 2013

Grad School & Employment Opportunities Panel (Panel) The Missouri Branch of the American Society for Microbiology Annual Meeting. March 22, 2013

"High Throughput Comparative Sequence Analysis Reveals Structural Diversity and Improved Potency Among RNA Inhibitors of HIV Reverse Transcriptase" (Poster) The 19th West Coast Retrovirus Meeting. October 4-6, 2012

"Previously Overlooked CoA Aptamers Revealed by High-Throughput Analysis" (Poster) The 17th Annual Meeting of the RNA Society. May29-June 2, 2012

"Previously Overlooked CoA Aptamers Revealed by High-Throughput Analysis" (Poster) Missouri Life Sciences Week. April 16-21, 2012

Manuscripts in Preparation:

Kyle J. Hill & Donald H. Burke. *"RNA Packaging Mechanisms: How Exosomes and Viruses Interface with the Cytoplasmic RNA Environment"*

Kyle J. Hill, Alexander D. Swain & Donald H. Burke. *"Aptamer APEs: Intracellular RNA-RT interactions drive encapsidation of, and viral suppression by, anti-RT RNA aptamers"*

Kyle J. Hill, Alexander D. Swain & Donald H. Burke. *"5'L APEs: Intracellular RNA-RT interactions drive encapsidation of HIV viral genome"*

Kyle J. Hill, Alexander D. Swain & Donald H. Burke. *"Herding CATS: Enhanced viral packaging and antiviral bioactivity of Combinatorial Aptamer Transcripts"*

Carolina Camargo, Margaret J. Lange, **Kyle J. Hill**, Flore K. N'Guessan & Donald H. Burke. *"Promoter Optimization for Vector-Mediated Delivery of Antiviral RNA Genes"*

Honors & Awards:

Travel Award ($200) **–** MU Graduate Professional Council (GPC), Spring 2015
Travel Award ($300) – Life Sciences Center Post-doc Graduate Student Association (LSC-PGSA), Spring 2015

Teaching Experience:

University of Missouri, Columbia – MICROB 2800 Microbiology for Nursing and Health Professions, Fall/Spring 2012

Mentoring Experience:

Students Mentored:

- Kwaku D. Tawiah, biochemistry PhD student, 2014 – Present
- Alexander D. Swain, undergraduate biology student, 2014 – Present
- Katherine N. Wilsdon, undergraduate biochemistry student, 2013 – 2014
- Siddhant Gupta, summer research intern, 2013

Relevant Graduate Coursework:

University of Missouri:

- Advanced Topics in Biological Engineering (BIOL_EN 8001)
- Commercialization Life Science Innovations (MANGMT 8200)
- Immunology (MICROB 7304)
- Virology (MICROB 8303)
- Mechanisms of Microbial Pathogenesis (MICROB 8404)
- Molecular Biology II (MICROB 9432)

- Scientific Discovery Leading to Life Science Innovations (MPP 8000)
- Introduction to Research Ethics (V_PBIO 8641)

Service and Professional Membership:

RNA Society, Student Member, 2015 – Present

American Society of Gene and Cell Therapy, Associate Member, 2014 – Present

Officer/Webmaster, Flying Samaritans, Irvine Chapter 2007 – 2008
- Involved in charity work with a privately owned clinic in the town of El Testerazo, Mexico.
- Participated in local community programs including the Walk for Life, the AIDs Walk, and an HIV/AIDs outreach program we created in conjunction with the UCI Health Clinic.
- Maintained http://www.flyingsams.com/ utilized for informational services and membership tracking

Officer/Webmaster, UCI Motorcycle Club 2006 – 2008
- Help instill safe motorcycle practices in beginners through proper example.
- Organize group trips and Track Day activities with members.

Tutor Pal, Big Brothers Big Sisters of Orange County 2005

School on Wheels, Volunteer tutor for underprivileged children living in homeless conditions 2008

Skills, Competencies, & Interests:

- Biochemistry, Cell and Molecular Biology
- Protein Expression and Purification
- Nucleic Acid Biochemistry
- Mammalian Cell Culture
- Aptamer Selection and Characterization
- Drug Discovery & Targeted Drug Delivery
- Gene and Cell Therapy
- High-Throughput Sequencing
- Synthetic Biology
- Confocal Microscopy
- Biotechnology
- Biomolecular Engineering
- Diagnostics and Therapeutics
- Bioinformatics
- Unix/Linux Command Line
- Software Development (Perl, Python and Java)
- Science Communication and Outreach
- Virology
- Cellular Biology