



Andrea Henricks



Name: Andrea Henricks

Year: 2013

Concentration: Chemistry switching to MCB soon

House: Cabot

Hometown: Lakeland, Florida

Research project: Trying to determine the function of VAMP (vesicle-associated membrane protein)-4 in NK cell cytotoxicity

About Andrea: Besides lab and school, I volunteer at Children's Hospital and the homeless shelter and am a chemistry tutor. I just quit the crew team (best decision ever!) and love running, traveling, sleeping, eating, and making new friends!

Embarrassing lab experience: When I was 16, I spent a month working at my aunt's lab at HMS. One day after work, I went out for beers with the lab (minus my aunt) and thought I was so cool when they didn't card me cause I was with a bunch of 30-year olds. The next morning, my aunt took me into her office and gave me a huge lecture about how I had embarrassed myself and her in front of all of her colleagues.

Fun fact: I'm also hostessing at the Asgard in central square a night or two a week, and we have 10 cent wing night on Mondays and trivia on Tuesday, so come visit me!

Ketsia Saint-Armand



Year: 2014

Concentration: History of Science

House: Cabot

Hometown: Port-au-Prince, Haiti

PRISE research project: I'm in an immunology lab that is studying a special population of immune cells, called invariant Natural Killer T Cells (iNKTs). It's a very understudied population, and as a result, my project is a bit esoteric, but it's nice to work on what is literally a frontier region of science. Two years ago, one of the postdocs in our lab discovered a whole new subset of iNKT cells that reside in the fat in humans (and also in mice). Apparently, they orchestrate the immune response for more complex diseases that rely on nuances of cell-cell recognition, like cancer, which makes normal T cells anergic (unable to function and mount an immune response, which in turn paralyzes the immune system and makes tumors undetectable). Also, iNKT cells have different levels of effectiveness against certain diseases; the effects of iNKT cells from the thymus on mediating antitumor immunity are negligible, while liver cells can initiate near-complete tumor regression. So I'm working on two things: learning more about the potency of fat iNKT cells versus liver iNKT cells and running a series of assays to see how the tissue microenvironment determines the potency of iNKTs derived from a hematopoietic stem cell line. Liver iNKT cells have been studied for about 10 years, and they're believed to be the best type of cells in the immunotherapies for cancers,

Richard Sima



Year: 2012

Concentration: Neurobiology (Mind, Brain, Behavior Track)

House: Quincy House

Hometown: Buffalo, NY

PRISE research project: I'm in the Kravitz Lab working on establishing a social defeat model for depression using fruit flies. Male fruit flies display aggression behavior which leads to a "loser effect" in the fly that loses its first fight such that it's severely biased to losing subsequent fights in the future. This effect is persistent despite pairing flies of the same genetic background, age, and size. Using this aggression assay, I'm testing various psychiatric compounds that have been found to be effective for treating depression in human patients (such as serotonin and dopamine) as well as mood stabilizers (such as Depakote and lithium) to observe their efficacy on perturbing and reversing the loser effect. Building upon that foundation, the ultimate goal is to use this model as a high-throughput screen for novel antidepressant compounds, especially ones that work through different molecular pathways than the handful that are currently used. My next project this summer will be testing the effect of various histone deacetylase (HDAC) inhibitors, which produce epigenetic modifications that is hypothesized to underlie antidepressant action, using this social defeat model.

About Richard: When I was a kid, I'd always rush home to catch Bill Nye the Science Guy and The Magic School Bus, shows that helped introduce me to the wonders and beauty of science. I'm now obsessed with Carl Sagan and Neil deGrasse Tyson, and share their belief in the importance of science education and popularization. To that end, I volunteer teaching kids science through ExperiMentors. I'm also involved with the Harvard Society for Mind, Brain, and Behavior and building houses with

although the number of cancers they can effectively act against is limited. However, since there's also a large population of iNKT cells in the fat, we think that fat iNKTs may prove to be just as effective - or maybe more so - than liver iNKT cells. Also, since humans do not have as proportionally large a population of iNKT cells in the liver as mice do, it's important that we understand more about the large reservoir of immune cells we have in the fat.

About Ketsia: I've hated science for as long as I can remember. Since I was in elementary school, it was my least favorite subject, and I filled the margins of my high school biology notebooks with what I thought were stinging invectives against the subject while I pathetically wallowed in the throes of preteen angst. When I came to Harvard, however, I discovered the one fact about science that they keep hidden from you (well, they did in my schools, at least): science is actually fun. Although I didn't really enjoy my science courses prior coming to Harvard, I did manage to cultivate an interest in earth science, particularly in the study of water movement in aquifers, along with a more general interest in the forces economic, social, and political driving water allocation. After coming here, I switched gears completely to biology, and I got interested in some particularly esoteric aspects of membrane biology. This summer, through a happy accident of chance, I landed in an immunology lab, and it's been happy, albeit not smooth, sailing since.

Outside of science, I am on the boards for the Haitian Alliance and Society of Black Scientists and Engineers. Through PBHA, I do SAT tutoring and participate in an elderly visiting program.

In the future, I can see myself going back to studying water movement, though my shaky plans are certainly subject to change. If it isn't disbanded altogether or gotten rid of through some foolish measure coming from that bastion of fools known as Congress by the time I attain the necessary degree(s), I'd like to work for the EPA.

Most embarrassing lab experience: When we were separating breeding mice from pups and mothers, we had to put new labels on the cages. My postdoc told me to write very big. Naturally, I assumed that she wanted me to write "**VERY BIG**" in caps on the labels, which I proceeded to do, much to her chagrin when she came back to observe how I was doing. That day was particularly long.

Fun fact about you: I have broken every single finger on both hands at least once, but never a toe.

Habitat for Humanity. To top things off, I'm really into video games and always love telling and hearing a good joke.

Most embarrassing lab experience: I've probably accidentally ingested at least a few flies in lab over the years. But my most embarrassing lab experience was probably was probably a high school cow heart dissection lab that ended up spouting blood all over my clothes. I had to give my student council candidacy speech in a slightly serial killer-esque get-up. Needless to say, I didn't win.

Fun fact: I've had holes in both of my lungs which have led to their collapse and my subsequent hospitalization. I'm quite the hole-y man. (Fun fact #2: I should be punished for that.)

Levent Alpoge



Year: 2014

Concentration: Mathematics

House: Quincy

Hometown: Dix Hills, NY

PRISE/BLISS/PRIMO research project: I'm doing a math project under Prof. Benedict Gross--right now I'm learning about something called Tate's thesis. In layman's terms, a field of number theory, called class field theory, had been developed using methods that didn't seem in place--like proving that five is bigger than 3 by evaluating a complicated integral, or something (well--much more nuanced than that, but you get the point). These were the methods of analysis, which were replaced by purely algebraic methods. So the whole theory was redeveloped by Chevalley and others in terms of fancier objects that took all of the analysis out of class field theory--but this approach yielded more fruit than was first intended. Hecke had proved a purely analytic result many years before that

Manjinder Kandola



Year: 2014

Concentration: Chemical and Physical Biology (CPB)

House: Leverett!

Hometown: New York City

PRISE research project: I'm currently working on cardiovascular research over at Beth Israel Medical Center. My main project is to investigate the role of p16 (a tumor suppressor gene) in the heart: although p16 serves to prevent tumor cells from dividing by inhibiting the cyclin-dependent kinase, a key regulator of the cell cycle, it may also inhibit cell proliferation through the same pathway. Currently I am using a small interfering RNA (siRNA) transfection method to demonstrate that both mRNA and protein levels of p16 can be significantly reduced in neonatal rat cardiomyocytes (heart muscle cells), and hope to eventually explore the phenotypic effects of such a knockdown.

My second project is to attempt to direct the differentiation of induced-pluripotent stem cells (iPS cells) into cardiomyocytes. This would be very useful in creating disease models to study genetic heart disease, and would have potential affects in surgical heart repair while bypassing potential immune response because the patient's own cells could be used. However, this project is still in its early stages, and so most of my time is spent on the formerly described p16 work.

About Manjinder: I can't remember any specific experiment or explosion that got me into science, but I have been interested in the subject as long as I can remember. From volcanoes to liquid nitrogen to the physics of roller coasters, I've got to admit science has been quite the ride. At Harvard, my most

required a lot of nasty computation and overcame many technical obstacles--an unsatisfying proof, really. Then Tate, with the advice of his advisor Artin, came along and simplified this proof remarkably by taking these algebraic objects of Chevalley, created only for algebraic purposes, and applying analytic methods to them! The result was a PhD thesis that is still in the mathematical canon today (Tate was the advisor of Gross, who was the advisor of Prof. Elkies, so it's not exactly hot off the presses...). So that's the story I'm learning about. The technical details are immensely interesting as well, of course, but much of the beauty lies under piles and piles of definitions, so I'll leave that for later.

About Levent: When I'm not shut away doing mysterious math stuff, I'm running, lifting, playing soccer, hanging out with friends, sleeping, or eating. It's pretty chill. MLIB

Most embarrassing lab experience: I once had to do a stain (yes, in a wet lab) in which I had to boil water. So I turned the Bunsen burner on and waited. And waited. And waited...until it was 2 AM, some eight hours later, and my stain was of course ruined. I was also working on a CS project at the time, and that perhaps gave me an idea of which one I was better suited for...

Fun fact: I was born and raised here, but I spent almost every summer of my life in Turkey until I started doing research during summers. I speak Turkish fluently and am now a citizen as well. Also, my Erdos number is 2.

enjoyable activity has been to dance with the Harvard Bhangra team (an Indian dance) team and help choreograph for Ghungroo this past year.

Most embarrassing lab experience: The first time I sat down to do cell culture, my mentor explained to me that the most important thing was to ensure that the pipette tube did not touch anything except for the sterile medium and the cells. I told him that I could handle it and confidently sat down in front of the hood, and then proceeded to touch just about everything from the hood wall to my glove to my lab coat with the pipette tube. Let's just say a lot of pipette tubes were thrown out before I finally did the simple task of changing cell media.

Fun fact: I'm a huge Lakers fan and love watching basketball. Although they didn't make it to the finals year, it was very memorable watching the series and rooting on the Mavs (anyone but the Heat...) with fellow PRISE enthusiasts. It's too bad the NBA is currently in a lockout...

Will Sun



Year: 2013

Concentration: Chemical and Physical Biology

House: Cabot

Hometown: Chesterfield, MO

PRISE research project: My project focuses on the pathogenesis of spinal muscular atrophy (SMA), a motor neuron disorder that is the leading genetic cause of death

Tami Kim



Year: 2012

Concentration: Government

House: Leverett

Hometown: Mukilteo, WA

PRIMO research project: I'm working on a PRIMO project with Ryan Buell and Professor Michael Norton on labor illusion and anthropomorphism. The idea is that when we use anthropomorphize technology services, we falsely believe the service to be higher in value.

About Tami: My close friends rarely call me by my real name, and instead use my nickname "tamsta." I'm not

in infants. SMA primarily arises from diminished levels of Survival of Motor Protein (SMN), and through the use of high-content screening, we have identified compound classes that rescue cell death by elevating SMN levels. By further exploring the mechanism of inhibition for these compounds and identifying common up-regulated pathways, we hope to elucidate the molecular processes underlying SMA.

About Will: When I joined a molecular biology lab in high school, I had the opportunity to work with a charismatic and truly inspiring mentor. To him I owe a large portion of my lab skills, but perhaps more importantly my interest in continuing to explore biological phenomena here at Harvard. Outside of research, I'm heavily involved with THURJ and HUBSS, and also work as a writing mentor for the Harvard-Allston Ed Portal. I'm a loyal (St. Louis) Cardinals fan, I find political philosophy to be incredibly interesting, and I enjoy discovering new music.

Most embarrassing lab experience: Not so much embarrassing as fail, but I recently had the misfortune of aspirating my RNA product into the waste flask, product that took several days for me to acquire. Next time, I intend on not being quite as lazy and will replace vacuum suction with a hand-powered pipette.

Fun fact: I spent last summer working on the privacy and legal implications of national security surveillance at a think tank in DC.

sure where the nickname came from, but it stuck with me since my freshman year. Although government is my concentration, I'm interested in eventually going into academic research in business management and/or marketing. During the school year, I'm on the exec board for Harvard Ad and Marketing Club and work as a peer advising fellow. I also co-manage the CrimsonBikes program, which officially launched couple weeks ago (ask me about joining!)

Fun fact: I have a **gigantic** stuffed puppy named kimchi.

Andrew Kennard



Year: 2013

Concentration: Applied Math (Biology focus)

House: Quincy

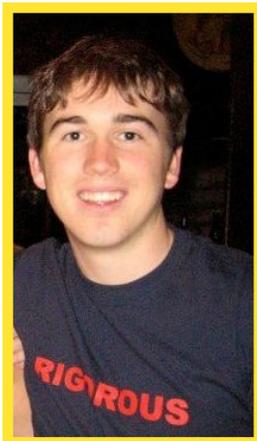
Hometown: Seattle, WA

PRISE research project: I am mapping out the interactions in a signaling network in the cyanobacteria *Synechococcus elongatus*. Understanding the connections and dynamics of this network can help reveal how the organism collects information about its environment and robustly initiates the appropriate responses.

About Andrew: When I was 5 I had two career aspirations: karaoke singer, or mad scientist. By high school I had moved on to other things, but I still recall the conversation with myself in which I decided that the only thing I liked doing for sustained periods of time was learning, so I better go into science! I've been pretty set since then, though my field of interest has changed several times.

Most embarrassing lab experience: By the time I arrived at lab this summer, the first part of the work for my project had been done by a former rotation student, Fred, including a number of PCR samples. I used some

Matt Mulroy



Year: 2012

Concentration: Earth and Planetary Sciences & Environmental Science and Public Policy (EPS/ESPP)

House: Mather

Hometown: Carpinteria, CA

PRISE research project: I use atmospheric transport and biosphere carbon-exchange models to estimate carbon dioxide surface fluxes in the Los Angeles Basin. Once I create an adequate flux model, I can optimize existing emissions inventories may provide researchers and policymakers with better information for the size and origin of carbon dioxide emissions.

About Matt: I love nature and the outdoors, and have always been drawn to science so I could understand the world around me. I have never considered myself a curious individual and have generally been satisfied while limited by the information others struggled to collect in the past. Until I came to Harvard, I saw science as a type of knowledge and not as a method. I continue to see the same value in assimilating facts and procedures recorded by others (a great skill, no doubt), but I also have an appreciation for the brilliantly creative researchers whose findings and methods I use to make observations of my own. My hope is that I can one day find or create something new--a model, a relationship, a technique--which others will find useful. In the meantime, I use models that others have already made and generate lots of cool graphs.

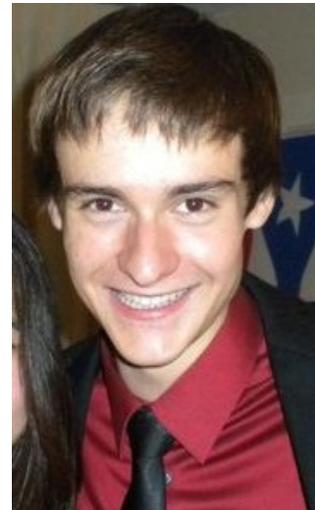
Most embarrassing lab experience: I'm alone in an office all day it's nearly impossible for anything embarrassing to occur

Fun fact: My first job at Harvard was moving refrigerators with a U-haul truck. Now I'm bartender.

of them on the first day, and then forgot to put them back in the fridge. My mentoring postdoc found out and told me, "You forgot to put the PCRs back, so they're ruined." Somehow I interpreted this as "Fred forgot to put the PCRs back, so they're ruined." I chuckled at how busy and distracted Fred must have been, and went on my merry way. A few weeks later when I tried to use the PCR samples again (it having momentarily slipped my mind that they had been thrown away), my postdoc said, "Remember you left them out overnight?" I told him I'd forgotten about it, but really I had been blaming Fred for it all along. That was quite a humbling experience.

Fun fact: I love jazz, blues, and old musicals. Hit me up if you want to jam sometime!

Chris Coey



Year: 2012

Concentration: Applied Math (Economics)

House: Kirkland

Hometown: Mackay, Australia

PRIMO research project: The Nature of Advice From Commissions-Motivated Agents

About Chris: Before my college years, I was crazy about science and went through many phases - paleontology, chemistry, electrical engineering, geology, marine bio, and many more. But then when I came to college I realized I enjoy math and I realized it can be applied to so many phenomena in the world, including the way humans interact and organize. So I started to study Applied Math and Economics. Apart from my academic interests, I am very interested in international affairs and development, so I am involved with the IRC and I spent last summer in 3 different developing countries (Rwanda, Nicaragua, Dominican Republic).

Carol Tran



Year: 2014

Concentration: HDRB or History and Science

House: Kirkland :D

Hometown: Richmond, CA (San Francisco Bay Area)

PRISE research project: My research project focuses

on the role that biomechanical forces play in the regulation of the developing cardiovascular system during embryogenesis. Specifically, we want to examine how fluid shear stress--the frictional force that blood generates tangentially on the endothelium as it flows through blood vessels after heartbeat initiation--help determine hematopoietic potential at this stage of development. Our previous studies with mouse embryonic stem cells differentiated *in vitro* showed that fluid shear stress increases in hematopoietic progenitor cells both the expression of *Runx1*, a transcription factor that's the master regulator of hematopoiesis, and hematopoietic colony-forming potential. Now we are transitioning into the human model and doing experiments using embryoid body-derived cells differentiated from human induced pluripotent stem cells.

About Carol: Aside from science I also care a lot about social justice issues such as using education reform to alleviate socioeconomic inequalities and close the achievement gap.

Most embarrassing lab experience: Many of my experiments involve looking at samples using microscope slides that have chambers (because the embryoid bodies (EBs) that we examine are too big to sandwiched flat between a normal slide and coverslip). We have to make the chambers ourselves using special adhesive plastic sheets. Well when I was first handling a slide that was filled with EBs I'd just spent hours doing experiments on, the adhesive got stuck to my glove and the whole slide flipped over, causing me to lose the contents. :[At least my postdoc could empathize since he made the same mistake around the same time.

Fun fact: I LOVE R&B (artists like Next, Boyz II Men, and Usher in the 90s haha).

Most embarrassing lab experience: When I used to work in a lab, I once dropped a bottle of ethanol and it splashed all over the floor and on my shoes. To break the awkward silence that ensued, I said "oh... smells like last night!". Then there was more awkward silence.

Fun fact: Back in Australia, I used to have 60 guinea pigs. People bought them for me as birthday presents and they just kept multiplying. I eventually had to let them free.