Alice Helena dos Reis Ribeiro

I started to be in contact with science when I was an undergraduate student. The disciplines that include cell biology and embryology were the most interesting to me. It has fascinated me the way we could understand the embryonic development by interfering it. Nowadays, I am a PhD student in the Laboratory of Embryology of Vertebrates from Institute of Biomedical Sciences of the Federal University of Rio de Janeiro (Brazil) under the supervision of Prof. José Garcia Abreu. I have been working on Developmental Biology since I was an undergraduate student, and the Developmental Biology always was striking to me.

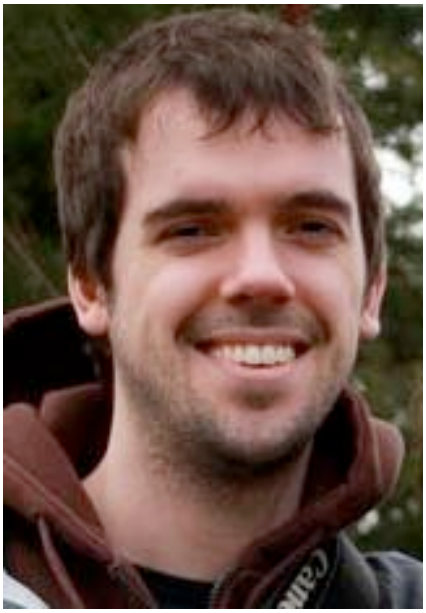
During my master degree I initiated a project using *Xenopus laevis* as a model. I did the morphological characterization of membrane microdomains during early *Xenopus* development. Through biochemical methods and transmission electron microscopy I found a specific morphology and dynamic composition of these structures during early embryonic development.

Currently, as a Ph.D. student I am investigating the role of the membrane microdomains during embryonic development of *Xenopus* and Chicken embryos and its participation with critical signaling pathways in the head development. We have described a detailed constitution of membrane microdomains during early *Xenopus* and chicken development and the results pointed the participation of these microdomains for the proper prechordal plate formation, as we could analyze by in situ hybridization, scanning electron microscopy and an extensive investigation by microinjections and tissue transplantation. In addition, we could show the expression patterning of one of the proteins that form these microdomains.

Now, we intend to tease out how membrane microdomains participate in specific signaling pathways during embryonic development to explain its role in head development. Furthermore, I'm very interested in early axis patterning. The intricate way that axes are formed during early embryonic development is very interesting and complex and how the cells acquire fate and correct position by signaling pathways instigate me a lot.

As I am in the last year of my Ph.D., I intend to apply for a post-doctoral position in a Developmental Biology laboratory in the US to consolidate what I have learned and to learn more about embryonic patterning.

Andrew Mathewson



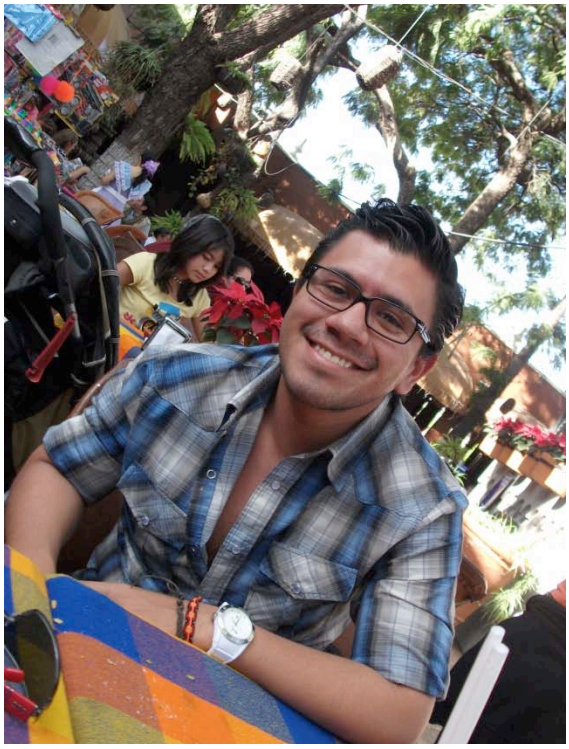
I am a second year graduate student in the Moens lab at the Fred Hutchinson Cancer Research Center in the University of Washington's Molecular and Cellular Biology program, located in Seattle, WA. Born and raised in Oregon, I earned my BA in Biology at Whitman College in Walla Walla, WA. I have always had a broad interest in biology, so when I joined the University of Washington in 2010 I rotated in a wide variety of labs. After investigating mitochondrial DNA mutational dynamics in mammalian cells and looking at aging in yeast, I fell in love with the cellular imaging possibilities in zebrafish. This is why I chose to join the Moens lab where I now study cellular migration during zebrafish development.

I am currently interested in the precise migratory events that help establish working neural networks in the brain. In the vertebrate hindbrain, the facial branchiomotor neurons (FBMNs) undergo a stereotyped posterior migration from rhombomere (r) 4 to r6. Forward genetic screens in the zebrafish for FBMN migration mutants have identified mutations in most of the components of the Planar Cell Polarity (PCP) pathway except for the protein Disheveled (Dvl). The PCP pathway is a cell-contact dependent mechanism for generating polarity in the plane of an epithelium, however the role of PCP in cell migration is poorly understood. I have found that expression of the PCP-specific dominant negative Dvl (Dvl-DEP+) specifically in FBMNs prevents their migration, demonstrating that FBMNs require Dvl activity and suggesting that the core PCP pathway is used to generate directional migration cell-autonomously, which was previously disputed. I hypothesize that PCP signaling between the planar polarized cellular environment in the hindbrain and the migrating FBMNs is required and possibly sufficient for directional migration. To examine the role of PCP signaling in establishing early FBMN polarity as well as its role in maintaining directional information throughout their migration, I am using inducible and tissue-specific Dvl-DEP+ expression to disrupt PCP signaling in migrating FBMNs and in their migratory environment in a temporally and spatially restricted manner. I am currently generating Gal4 and UAS transgenic lines to drive rhombomere- and floorplate-restricted Dvl-DEP+ expression to test where in the environment PCP signaling is required for normal FBMN migration. Together with these tools I will be able to determine the role of PCP in directing neuronal migration.

Related to my interests in biological imaging, I am an enthusiastic amateur photographer who enjoys backpacking in the wilderness with friends. I was a radio DJ in college and now I occasionally put together mixes and perform for small events. I enjoy biking to work and walking my cat on a leash (really). When I am not in lab I am playing Frisbee or obsessively surfing the Internet. I also enjoy teaching and frequently volunteer with students in the Seattle area to raise awareness regarding career opportunities in scientific research.

Ashish Deshwar

I am currently a second year graduate student in the lab of Dr. Ian Scott at the Hospital for Sick Children in Toronto, Canada. I completed my undergraduate degree in Zoology at the University of Calgary where I spent my summers working with a variety of cool model organisms including pond snails, geckos and fruit flies. In the Scott lab we use the zebrafish as a model system to study heart development. My particular project is focused on the earliest molecular steps in the formation of the cardiac lineage. Our lab has found that the over-expression of Gata5 and Smarcd3b can direct non-cardiac cells to migrate to and form part of the heart in the developing embryo. By studying how this phenomenon works I hope to uncover novel regulators of cardiac progenitor development.



Rodrigo G. Arzate-Mejía

Instituto de Fisiología Celular

Universidad Nacional Autónoma de México (UNAM)

Second Year Graduate Student

Graduate Program on Biomedical Sciences

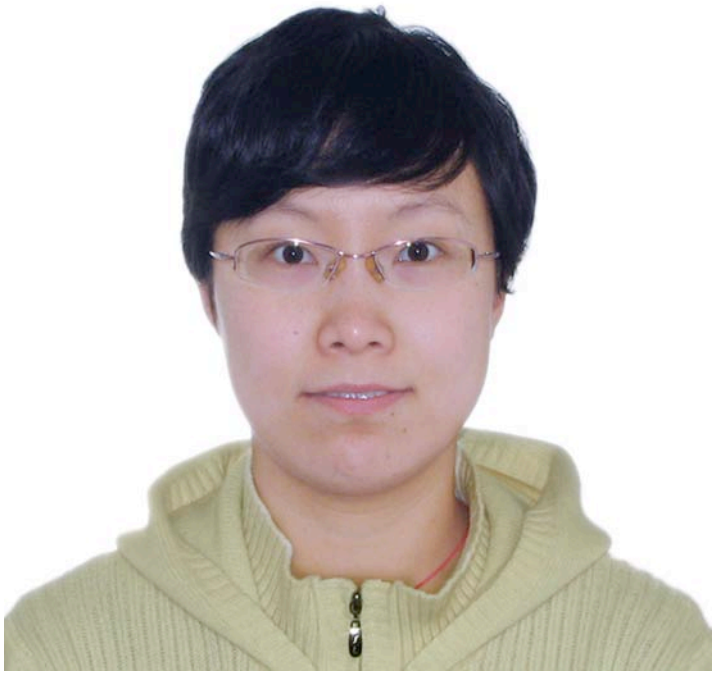
The study of epigenetics is founded upon trying to understand unexpected observations, perhaps more than in any other field of biological research. An epigenetic phenomenon can be defined as a change in phenotype that can be inherited and do not involve any change on DNA sequence.

During development, hundreds of cell types emerge from a single cell. All of those cells share the same DNA sequence; however they have different patterns of gene expression. How is this achieved, is one of the most exciting questions in biology.

The eukaryotic nuclear genome is highly organized. Specialized proteins are required for maintaining this high degree of order, mediating, among other things, both intra- and inter- chromosomal interactions. One particular role played by a subset of these proteins involves creating functional domains that can be transcribed independent of each other. These proteins are referred to as insulators. In vertebrates, there is one such described protein: CTCF. In contrast, in the fruit fly, Drosophila melanogaster, there are five such proteins known, amongst which is the fly homolog of CTCF, dCTCF. Several recent genome-wide studies have identified the DNA binding sites for these fly insulator proteins in different cell types. dCTCF was found to associate with and be enriched mainly in promoter regions of genes. Also, it is know that mutations in dCTCF are lethal, suggesting a vital role.

Using bioinformatics and available ChIP-chip and ChIP-seq data for dCTCF, I have classified putative target genes into classes. These results suggest that dCTCF is involved in the regulation of developmental genes, with Gene Ontology categories like Cell Signaling being particularly enriched. Our working hypothesis is that dCTCF is an important epigenetic regulator of fly developmental genes.

Chang Liu



Chang Liu is a third year PhD student from Shanghai Institute of Biochemistry and Cell Biology, Chinese Academy of Sciences, China. She is studying stem cell biology and mouse embryonic development in Professor Naihe Jing's Lab. She has recently finished a two month visit to Professor Patrick Tam's Lab in Sydney and acquired some of the requisite embryonic technologies.

Chang's research interest is on the development of mouse definitive ectoderm and the origin and character of the precursors of the neurectoderm in the mouse embryo. They have found that Ectoderm Stem Cells may exist during Epiblast Stem Cell (EpiSC) monolayer differentiation. These cells generated from EpiSC can be induced to take an epidermal fate or neural fate. Further analysis showed that some marker genes were specifically expressed in these Ectoderm Stem Cells. These marker genes were also expressed in prospective embryonic region. Moreover, dissected tissue from this region in embryo can be induced to epidermal fate or neural fate in vitro, suggesting the existence of the Ectoderm Stem Cells. Through the combination of state of art technology of laser microdissection and single cell sequencing, her project is aiming to identify the Ectoderm Stem cell, reconstruct the gene network of Ectoderm stage and eventually establish the Ectoderm Stem Cell line.

Davon Callander

How might changing environmental conditions affect the biogeographical distribution of marine animals in the future as the climate continues to change? Understanding the stress response would help ecologists predict where populations might be more (or less) vulnerable to these climate changes.

For my PhD, I've been interested in how mussels respond physiologically to environmental stress. After inducing stress in the field through a series of translocation experiments, I investigate their stress-response gene expression with RT-qPCR. In the rocky intertidal, I can alter the environmental stress by moving mussels around between intertidal zones or between sites. About half my time has been spent doing fieldwork on rocky shores in New Zealand, and the other half in the lab doing RT-qPCR.

While my current research is not developmental biology, I do have a zebrafish neurodevelopmental background. My MSc research examined the role of semaphorins, a repulsive axon guidance molecule, in patterning the developing visual system in zebrafish.

In my future research, I hope to couple environmental stress and marine biology with development by studying how stressors affect embryonic development of marine organisms.

Daniela Di Bella

Transcriptional regulation of neuronal differentiation.

I am going through the second year of my Ph.D. project in the Developmental Neurobiology Lab in Instituto Leloir, Buenos Aires, Argentina. I am a graduate student at the Universidad Nacional de Quilmes.

Both my undergraduate work and my current research project are aimed at understanding the mechanisms involved in the generation of diversity among neuronal cell types in the developing neural tube. More specifically, we are trying to understand the genetic mechanisms that control the ontogeny of specific subsets of ventral neurons in the mice spinal cord. In order to do so, we take advantage of mouse genetical strategies for performing loss and gain of function studies and fate mappings experiments.

Dorit Hockman

I am a South African currently doing my PhD at the University of Cambridge. I am very interested in the field of evolution and development. I did my MSc in Cape Town where I investigated the development of bat wings. I am currently researching the evolution and development of oxygen-sensing cells in a variety of vertebrates. Apart from science, I love doing any fun activity that involves the outdoors and I am very keen on art and photography.

Eduardo Zattara

I have been interested in Evolution for as long as I have been interested in Biology, going all the way back to high school. During my undergrad studies in Bariloche, Argentina, I quickly became convinced that current evolutionary theory was missing the role of development, and that only by understanding how variation in genotypes are parsed by development into the phenotypes that get exposed to natural selection we could achieve a more complete theoretical framework. However, no one was working in evo-devo at my school, so I worked on freshwater fish population genetics and biogeography for my undergrad dissertation. After graduating, I got a two-year research fellowship to study Patagonian freshwater fish ecosystem dynamics and spatial database building and analysis through Geographic Information Systems. Towards my second year as a fellow, I knew I wanted to go back to my original topic of interest, so I contacted Dr. Bely and set on the adventure of coming to the U.S. East Coast for a Ph.D. Since then, I have been working in the evolution of post-embryonic developmental trajectories in freshwater annelids capable of regeneration and asexual reproduction by fission, which I found are a great example of developmental channeling of parallel evolutionary innovations.

Developmental bias or channeling, the idea that pre-existing developmental capabilities have a crucial role in vetoing certain evolutionary directions and facilitating others, is one of the main concepts behind evolutionary developmental biology, or evo-devo. A consequence of developmental bias is that parallel evolution of certain traits is way more common than traditionally thought, and this fact is often ignored when assessing homoplasy in phylogenetic character mapping. I am using a family of small freshwater worms (Annelida:Clitellata:Naididae) to study developmental bias and channeling during the evolution of asexual reproduction.

The core of my doctoral dissertation is the study of developmental and evolutionary relationships between two annelid post-embryonic developmental trajectories, reparative regeneration and agametic asexual reproduction by fission. I have approached the topic by doing detailed comparative studies of both trajectories in a single species, *Pristina leidyi*, and across multiple species belonging to two groups that evolved fission independently. The striking similarities between independently evolved fission trajectories is best explained by strong developmental channeling due to repetead co-option of regeneration processes.

I am also interested in the developmental mechanisms underlying regeneration and fission. I have been investigating the source of new tissues by developing novel techniques for cell tracing and *in vivo* long term time-lapse imaging in adult organisms, and am currently working out fate maps and exploring the role of putative migratory stem cells, including the annelid neoblast. On the other hand, I am exploring how post-embryonic developmental processes are integrated with normal growth and maintenance, and how physiological strategies of organismal resource allocation influence population dynamics.

Elsie Place

The indispensable role of Bmps in vascular development and homeostasis is highlighted by genetic knockouts and by human disease-associated mutations: homozygous loss of Bmp pathway components leads in many cases to lethal vascular abnormalities, and mutations in Bmp receptor genes have recently been shown to underlie the human vascular diseases pulmonary arterial hypertension (Bmpr2, Alk6) and hereditary haemorrhagic telangiectasia (Alk1, Endoglin). I recently joined Jim Smith's lab in London, where I am exploring the action of Bmps on the developing zebrafish vasculature using a combination of small molecule inhibitors, high-throughput RNA sequencing, and morpholino oligonucleotides. Treatment of zebrafish embryos with a small molecule inhibitor of type I Bmp receptors results in a defect in angiogenic sprouting from the caudal vein. A former student in the lab identified Id proteins as Bmp-responsive targets in zebrafish endothelial cells; I am therefore investigating whether the Ids are key downstream regulators of this sprouting event. Future work will aim to identify more Bmp target genes by RNA profiling, and also will explore the influence of Bmps on vascular mural cells during zebrafish development.

Jennifer McKey

PhD Student – “Involvement of the *Lix1* gene in the neuromuscular development of the gastrointestinal tract in the chick embryo” (INSERM U1046 – Montpellier, FRANCE)

I have had a special interest for Biology during myentire education. After a lot of reading and discussionswith scientists from different aspects of the biomedicalresearch field, I became particularly interested indevelopmental biology, and the cellular and molecular studies that are its fundament. I have always chosen my academic courses according to this affinity. I especially sought to gain experimental and laboratory experience by doing various research internships.

This has led me to work with different animal models, such as *Xenopus*, zebrafish and the chick embryo. I have learned to use these models to study three different developmental phenomena: neural crest cell migration, evolution and development of the sensory nervous system and development of the gastrointestinal smooth muscle.

These experiences have taught me that for each question in developmental biology, there is an animal model that is best suited for experimental investigation. Now, I am definitely committed to research in developmental biology and began work within the graduate program “Control of Cell Determinism” at the University of Montpellier (France). For my PhD, I joined a research project supervised by Dr. Sandrine Faure, in Dr. Pascal de Santa Barbara’s team on “Visceral smooth muscle: development and disease”. The lab’s project is to study the molecular mechanisms involved in the differentiation of the visceral smooth muscle in the chick embryo. Using a transcriptomic approach, I identified a candidate gene, *Lix1*, that I am now characterizing using descriptive and functional approaches. The chick embryo model allows linking fundamental questions in developmental biology to translational research applied to medicine. If *Lix1* proves to be an essential factor in the differentiation and development of the chick embryonic gut, I will be able to address its expression and role during human gut development, and particularly in pediatric gastrointestinal disorders such as Hirschsprung’s disease.

Joyce Pieretti

I am currently a second-year graduate student in the Department of Organismal Biology & Anatomy at the University of Chicago. My research focuses on how comparative studies can help us understand the evolution of transcriptional regulation and how that regulation influences development. From a broader perspective this research incorporates comparative developmental biology, evolutionary developmental biology, and gene regulation. As part of my dissertation, I am studying the appendage-specific enhancer of *Sonic hedgehog* in both cartilaginous and ray-finned fishes. I am interested in learning to what degree regulatory aspects of limb and fin development are homologous. This summer, as part of the MBL Embryology course, I hope to become more familiar with the developmental modes of a variety of metazoan organisms, and am excited to learn new embryological techniques.

Katherine Pfister

I completed my undergraduate work at the University of Virginia, graduating in 2009 with High Honors and a B.S. degree in Biology, and a minor in Chemistry. I worked as a research specialist/technician in Dr. Ray Keller's Lab for a year while applying to graduate schools. I began my graduate career in the Biomedical Sciences program at the University of Virginia in 2010, specializing in Molecular, Cell, and Developmental Biology. I completed rotations in Dr. Martin Schwartz, Dr. Adrian Halme, and Dr. Ray Keller's labs before joining the Keller lab in the spring to begin my dissertation work. My project focuses on the biomechanics of gastrulation movements, specifically regulation of myosin motors during Convergent Extension in the *Xenopus Laevis* embryo. I am interested in cellular imaging and biomechanical forces involved during development, but have not been introduced to the developmental mechanisms present in many other species, as of yet. I am hoping to apply my interests to other embryos, and acquire more technical skills in understanding embryology.

Lau Wang Chi

I am Lau Wang Chi, a first year graduate student from the Chinese University of Hong Kong. During my final year of undergraduate studies, I started studying the regulation of genes using mouse cerebellum as a model. Being fascinated by the beauty of the molecular mechanisms underlying the control of gene expression and the process of the neuronal development, my interest towards the development of CNS keeps growing and growing. Although there is a huge diversity among neurons, fundamental developmental procedures, are thought to be conserved. Uncovering the transcriptional cascades and gene regulations that govern this conserved process, will be extremely exciting. During my graduate studies, I am going to investigate transcription factors that are essential for the neuronal development using mouse as a genetic model. Utilizing techniques like organotypic slice culture or in-vivo electroporation, the conserved roles of my interested genes could be revealed.

Lucas Dent

Figure 1. Conservation of WNT in automobiles.

For reasons that are still a mystery to me, I did not become properly interested in science until after I started University. I was originally studying Economics and Arts, but felt very strongly that I was "missing out", and that what I really wanted to do was learn about the natural world. I enrolled in introductory Biology and Chemistry courses hoping that somebody would explain to me what a 'gene' was, and whether it was bigger or smaller than a piece of 'DNA'?

Needless to say, I was completely fascinated by everything that I learned and was impressed by the power of Biology, Chemistry and Physics as disciplines that help us to understand the world. In 2009 I completed a Science degree (and the Economics one) with a major in Genetics and Molecular Biology, and have pursued research ever since.

While my research has focused on molecular genetics and developmental biology, I have a very broad interest in the biological sciences which also includes but is not limited to; virology, microbiology, botany and neuroscience. I am also quite interested in car registration plates with famous gene names (see Figure 1).

Current Research: Combining proteomics and functional genetics to find new regulators of the Hippo pathway

I am currently in the second year of my PhD in Dr. Kieran Harvey's Lab, at the Peter MacCallum Cancer Centre, Melbourne, Australia. In my PhD I am using *Drosophila* to work on the basic and important problem of how correct organ-size is specified during animal development.

In order to improve our understanding of organ-size control, I am trying to find new proteins which regulate the Hippo signaling pathway. The Hippo pathway controls cell proliferation, final organ size, is required for regeneration, and also controls certain cell fate decisions. However, activation of the Hippo pathway during animal development is an enduring mystery.

The experimental approach we have taken is to combine proteomic and functional genetic screens in *Drosophila*. Early in my PhD we have been successful in identifying a number of new proteins which physically interact with a tumour suppressing kinase called, Hippo (Hpo). These also genetically interact with the Hippo pathway in vivo. From these candidates, my first biochemical and functional studies have focused on two small GTP-ase regulating proteins, which appear to hetero-dimerise in order to co-operatively regulate Hippo activity. The goal for the next two years of my PhD is to delineate the mechanisms by which these proteins regulate the Hippo pathway and its various roles in development.

Manuela Truebano

My research focus is in the multidisciplinary study of evolutionary adaptations to the marine environment. The research is “question driven”, and is dominated by two key questions: I) How do species respond to changes in environmental parameters across the different stages of their life cycle and at all levels of biological organization (i.e. from molecular to organismal)? and II) What are the effects of such responses for populations and ecosystems?. Accordingly, my research has focused on a coherent set of questions addressed by different techniques. During my Msc at Bangor University (UK) in 2004, I used population genetics to elucidate the effects of historical human aquaculture and transportation activities on natural oyster populations. In 2010, I was awarded my PhD by the School of Medicine at Swansea University (UK). I completed this in collaboration with the British Antarctic Survey and University of the Algarve (Portugal). My thesis was entitled “Thermal stress in the Antarctic clam *Laternula* and temperate mussel *Mytilus*”. In it, I applied a multidisciplinary approach to study the molecular mechanisms underlying physiological responses to thermal stress of Antarctic and temperate marine ectotherms, by analysing changes in their gene and protein expression profiles.

I am currently a postdoctoral researcher at Plymouth University (UK), where I integrate genomic tools into the work carried out within my research group in comparative developmental physiology. My interest lies in how different developmental strategies drive evolutionary adaptation. In particular, I am currently focusing on the idea that induced plasticity in the sequence and timing of developmental events, induced by changes in environmental drivers, can result in physiological differentiation within species, such differentiation being of evolutionary importance.

Marina Venero Galanternik

Currently I am a graduate student in Tatjana Piotrowski's laboratory at the Stowers Institute for Medical Research in Kansas City, Missouri. I was born in Russian but I grew up and went to school in Lima, Peru, so I am pretty much Peruvian. I am interested in understanding the molecular mechanisms taking place during the early development of the zebrafish lateral line. Specifically, I am trying to elucidate how the activation and interaction of developmental signaling pathways such as Wnt/β-catenin and FGF regulate collective cell migration, deposition and morphogenesis of the zebrafish lateral line primordium. The signaling pathways I am focusing on right now had previously been described in several different animal models. Therefore I feel the need to understand the events that occur during the development of these animal models and overlap this knowledge with my own line of research. This embryology course excites me mainly because it will provide me with insights into the development of novel, as well as, well-established animal models that I am unfamiliar with. Of course, when I am outside the lab, I enjoy dancing, playing with animals and practicing any outdoor activity specially hiking and running.

Matthew Clark

My current focus on the developmental neurobiology of *Drosophila melanogaster* began as a Post-Baccalaureate Research Education Program (PREP) scholar at the University of Michigan at Ann Arbor. In the laboratory of Bing Ye I was able to combine my fledgling interests in Live-Cell Imaging, Developmental Biology and Neurobiology. In the Ye laboratory I used the GAL4-UAS expression system to investigate the secretory pathway in larval dendritic arborization (da) sensory neurons. Within these elaborate neurons, I helped to characterize the dynamic properties of dendritic Golgi outposts using time-lapse confocal microscopy *in vivo*. Our investigations revealed that cargo is processed through Golgi outposts that are localized to branch points in the dendritic arbors and that there is a discrete organization of the cis, medial and trans compartments of the Golgi outposts.

This past summer I had the great fortune to attend the Summer Program In Neuroscience Ethics and Survival (SPINES) special topics course at MBL. During SPINES I learned many neuroscience laboratory techniques and met many colleagues and mentors. I look forward to returning to Woods Hole and meeting everyone in the Embryology course. To a varying degree I look forward to three square meals at Swope, drowning my sorrows of failed experiments at the Kidd and sneaking away to Secret Beach when I can.

Upon completion of the Embryology course I will be returning to my work in the laboratory of Chris Doe at the University of Oregon. Here I will be working with *Drosophila melanogaster* to understand how its complex nervous system develops. I am interested in investigating how temporal and spatial genetic information confers unique identities to neural stem cells, or neuroblasts (NBs). During my time in the Doe lab, I have been using *Drosophila* to understand temporal identity transitions in Type II NBs. In contrast to Type I NBs that bud off a series of ganglion mother cells that make two neurons, Type II neuroblasts are unique in their ability to generate self-renewing intermediate neural progenitors (INPs) that act as transit amplifying cells. INPs are multipotent progenitors that rapidly amplify proliferation. They make major contributions in the formation of highly complex neuropiles in the adult brain central complex. I am using both live-imaging and immunostaining techniques to better understand the role of transcription factors thought to play a role in the regulation of temporal identity. By understanding temporal identity transitions in INPs we can gain insight into mammalian neurogenesis in the neocortex, which also generates neuronal diversity through INPs.

Priti Roy

I did my B.Sc. and M.Sc. in Biotechnology with Lehninger's Biochemistry being my favorite text book. After joining PhD program at BSBE, IIT Kanpur, India, I was introduced to Gilbert's Developmental Biology in first semester at the course work. I was captivated and so when asked to choose a project for my PhD thesis, I saw a golden opportunity to integrate the knowledge from two of my all time favorite fields and explore the connections.

Metabolic enzymes have classically been studied by biochemists, in *in vitro* context, for their role as members of biochemical pathways. Ever since 1988, when crystallins, the major structural proteins of eye lens, from different species were identified as metabolic enzymes, members of metabolic pathways involved in glycolysis and kreb cycle have been reported to possess novel activities. Even in vertebrates, there are quite a few examples of metabolic enzymes being essential for patterning and morphogenesis during early development, like that of fringes (radical-, lunatic-, maniac-fringe), which are glycosyltransferases. Most of these novel roles of metabolic enzymes were serendipitously discovered. I have been interested in systematically investigating the role of metabolic enzymes in early development. Do tissues become different from each other while being formed, by differential expression of metabolic enzymes and thus differential metabolite synthesis? In search of an answer, a genome-scale expression screening of metabolic enzymes has been carried-out, in developing chicken. Interestingly, many metabolic enzymes showed tissue restricted expression, though tissue-specific enrichment of pathways does not emerge. Nonetheless, a number of metabolic enzymes are being co-expressed. The question is, do these metabolic enzymes have yet unknown activities *in vivo*? Are these still catalytic but novel and in the context of biochemical pathways. Or are these metabolic enzymes independently performing novel tissue-specific roles, catalytic or non-catalytic, during development.

Sharon Ruane

I completed my undergraduate degree in Biochemistry with Cell Biology at Trinity College Dublin. While there, I undertook a research project in John Scott's laboratory, investigating whether an ATT repeat associated with neural tube defects was acting via a disruption in folate metabolism. I am is currently a Wellcome Trust Doctoral Student in Chromosome and Developmental Biology at the University of Oxford. The initial year of this programme is spent carrying out two six-month rotation projects in different labs. I spent the first rotation in Matthew Whitby's lab investigating Homologous Recombination at protein-DNA replication fork barriers in S. pombe. Following this, I spent my next rotation in the Shankar Srinivas' lab, imaging dynamic cell movements in the Visceral Endoderm during early mouse embryogenesis. I chose to remain in this lab for my D.Phil project, where I have expanded on my initial work to investigate of the role of PCP signalling during AVE migration.

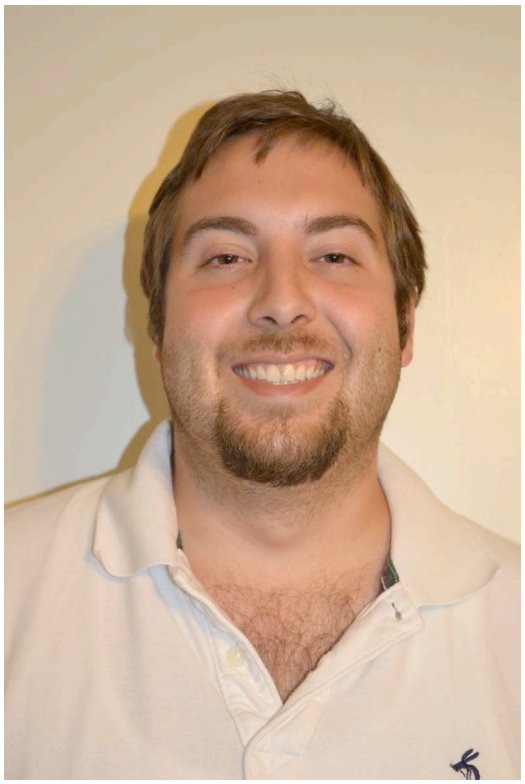
When I'm not dissecting early mouse embryos and putting them into confocal microscopes, I enjoy swimming, dancing and eating pizzas which are several times the size of my head.

Sol Gomez de la Torre Canny

Sol received her B.Sc. in Biology from the National Agrarian University in Lima, Peru. She is a Ph.D. candidate in Biochemistry and Cell Biology at Rice University in Houston, Texas. She studies the role of the p38 MAPK/MK2 signaling pathway in early development in the zebrafish. MAPK signaling pathways translate external stimuli into an adaptive intracellular response. MAPK-activated protein kinase 2 (MK2), a protein kinase activated by the p38 MAPK kinase signaling pathway, has been shown to have a crucial role in the activation of the inflammatory response in mammalian and tissue culture models. Sol uses *betty boop,* a maternal effect mutant in zebrafish to study the p38 MAPK/MK2 signaling pathway. *betty boop* is a mutation in the gene encoding *mk2a*, the zebrafish homolog of the mammalian MK2 (1). *betty boop* mutants are unable to complete epiboly, the first morphogenetic movement in zebrafish embryos. She has also shown that the zebrafish homolog of p38 MAPK is required for epiboly (1). She uses zebrafish epiboly as a model to probe the activity of the p38 MAPK, MK2, and proteins downstream of this signaling axis by expressing dominant negative and constitutively active forms of different proteins and studying their effect on epiboly progression. The striking phenotype of *betty boop* mutants consists in an aberrant contractile behavior, particularly localized in the yolk syncytial layer (YSL). *mk2a* activity is also required in the YSL (1). The integrity of dynamic cytoskeletal structures within the YSL is required for the successful completion of epiboly. She is developing *in vivo* assays to study the role of proteins that regulate cytoskeletal dynamics. Using time-lapse analysis to image these structures, she looks to better understand their role during epiboly and to dissect the potential regulatory role of the p38 MAPK/MK2 signaling pathway. The YSL is also the interface between the yolk mass and the embryo proper. Genes that encode for several metabolic enzymes and transporters are expressed in the YSL to allow the mobilization of nutrients in the yolk mass. In the future, she would like to explore the function of these genes during zebrafish early and larval development and their conservation in other species. Manipulation of the metabolism in the yolk may provide new insights into the role of nutrient availability and use during development and disease.

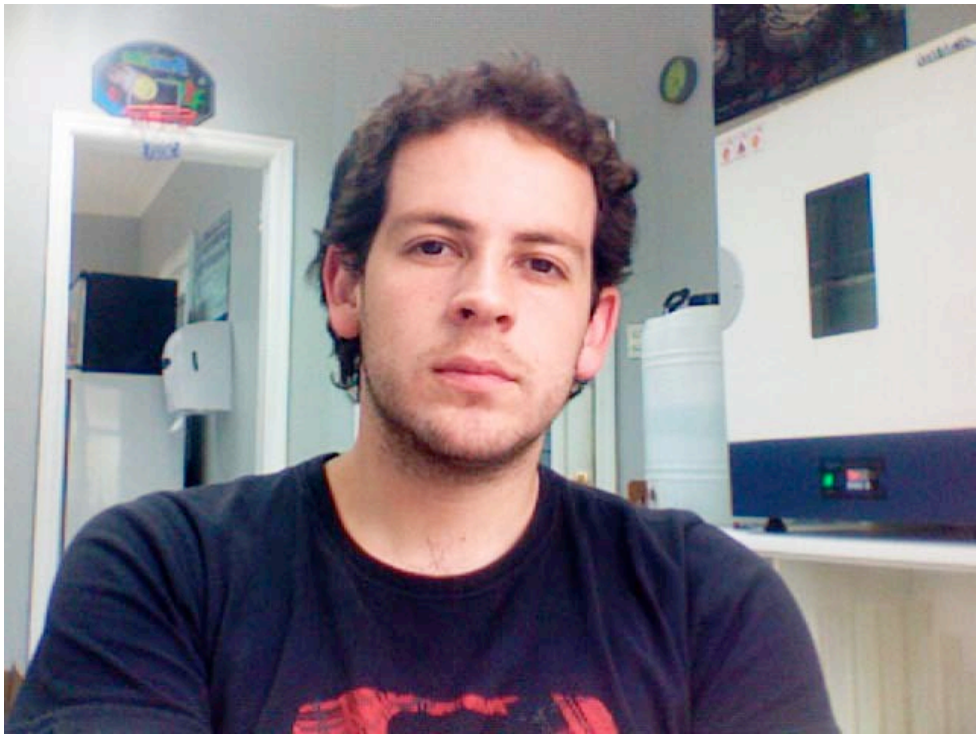
(1) Holloway, B.A., **Gomez de la Torre Canny, S.***, Ye, Y.*, Slusarski, D.C., Freisinger, C.M., Dosch, R., Chou, M.M., Wagner, D.S., and Mullins, M.C. (2009). A Novel Role for MAPKAPK2 in Morphogenesis during Zebrafish Development. PLoS Genetics 5.

William Munoz



Desmosomes contribute to the physical integrity of cell-cell assemblies, and the exchange of cell-cell signals. These junctions are comprised of multiple proteins including members of the transmembrane cadherin super-family, along with intracellular components such as plakophilin1→3 and plakoglobin, which despite their names are each members of the catenin family, and other proteins such as desmoplakin and intermediate filaments. Catenins contain an Armadillo domain responsible for multiple protein-protein interactions, bracketed by less conserved amino- and carboxy-terminal tails. The most prominent family member is beta-catenin, which acts in varying intracellular compartments, and is a key player in both normal development and human disease. My thesis is focused on Plakophilin-3 (Pkp-3), which I hypothesize has key functions in differing cellular contexts. Recently, we showed plakophilin-3 is required for *Xenopus laevis* development. Intriguingly plakophilin-3 knockdown phenotypes include hyposensitivity to touch stimuli, ectodermal dysplasia, and reductions in certain neural cell lineages as well as in cilia. My current work is focused on further characterizing cellular and developmental roles of Pkp-3, especially with regards to its poorly understood roles in the nucleus. This will provide the basis to ultimately address if Pkp3's role in gene regulation is in some manner linked to its roles at desmosomal cell-cell junctions.

Elías Barriga



Elías Barriga comes from Santiago, Chile. He attended the University Austral of Chile, Valdivia where he received his BSc and MSc in Biology in 2008. His degree thesis work was related to the role of the "Hypoxia-inducible factor on the zebrafish cardiogenesis" after conduct this work at Dr. Ariel Reyes Lab, Elías graduated obtaining *Cum laude* honors. On 2009 Elías started working as a lab technician at Dr. Ariel Reyes Lab, UNAB, Chile.

Since 2010, Elías Barriga is conducting a PhD programme at Universidad Andrés Bello, Santiago, Chile and is supervised by Dr. Ariel Reyes, Santiago, Chile and Prof Roberto Mayor at University College London (UCL), UK. On his PhD work, Elías is interested to shed lights on about the role of the oxygen levels and the hypoxia-inducible factor on the migration of the zebrafish a*nd Xenopus* neural crest cells. Currently, Elías is performing experiments for his PhD thesis at the laboratory of Prof. Roberto Mayor, UCL, UK.

Saori Tani

When I was a sophomore undergraduate student, I saw the living embryos for the first time. I observed ascidian embryos under the microscope from egg to larva. I was very impressed with the dynamic processes of morphological changes during embryogenesis. This experience led me to major in developmental biology.

I was adopted as an undergraduate research student in the laboratory of developmental biology (Professor Kazuhiro Makabe). My initial research experience was on small non-coding RNAs in ascidians.

I became a graduate student in my current laboratory, Inoue lab (Professor Kunio Inoue) at Kobe University, which has its specialty in the miRNA analysis in zebrafish. I was most interested in the function of miRNAs in living embryos, as well as the evolutionary mechanisms of developmental gene regulation. I started a new project on medaka miRNAs there. Throughout my research history, I have been fascinated by the beautiful appearance of embryos and the variety they show in morphological changes.

Progresses in the study of miRNAs of many animal species had suggested that miRNAs might play a major role in evolution of morphological complexity of vertebrates. After obtaining the master's degree, I started another research subject on miRNAs in muscle using both medaka and ascidian *Ciona intestinalis*. This year I will write a Ph.D. thesis, in which I would like to propose a new hypothesis for morphological evolution in which miRNA plays a key role.