



SLS eNEWSLETTER

VOLUME 2, ISSUE 4

**SCHOOL OF LIFE SCIENCES
MANIPAL UNIVERSITY, MANIPAL**

We extend our sincere gratitude to:

- Prof. K Satyamoorthy, Director, SLS
- Our faculty advisors - Dr. TG Vasudevan, Dr. Saadi Abdul Vahab, and Dr. Vidhu Sankar Babu;
- Student contributors of this issue
- Mr. Mahesh Nair (MSc 2014-16) for the photograph in the Cover Page.

Anant Kakar & Syamala Inumella
Editors (2015-16)

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EDITORS NOTE

Ola everyone, we are pleased to present to you our quarterly e-Newsletter, which also marks the end of our tenure as the Editors. This edition also marks the start of one of the prestigious Exchange Programs offered at SLS; this note coming to you along with some fresh tapas and paella from Barcelona, where six of us SLS students are spending the second year of our Masters (five months in Spain and six months in France) thanks to the Erasmus Mundus Scholarship scheme.

We also hope that our May 2016 edition, the 'What's Next' edition, helped to shed some light on the future possibilities after a BSc from SLS. As always, we await your feedback, and hope you enjoy reading this edition of the e-Newsletter. We are pleased to hand over the baton to the next council, who, we are sure, will continue to use the e-Newsletter as a platform to showcase the multifarious talents of the students of SLS. Many thanks to all the contributors, readers and supporters and hope that there will be more contributions and support in the coming years. *Adios y Buenas Dias!*

- Syamala and Anant

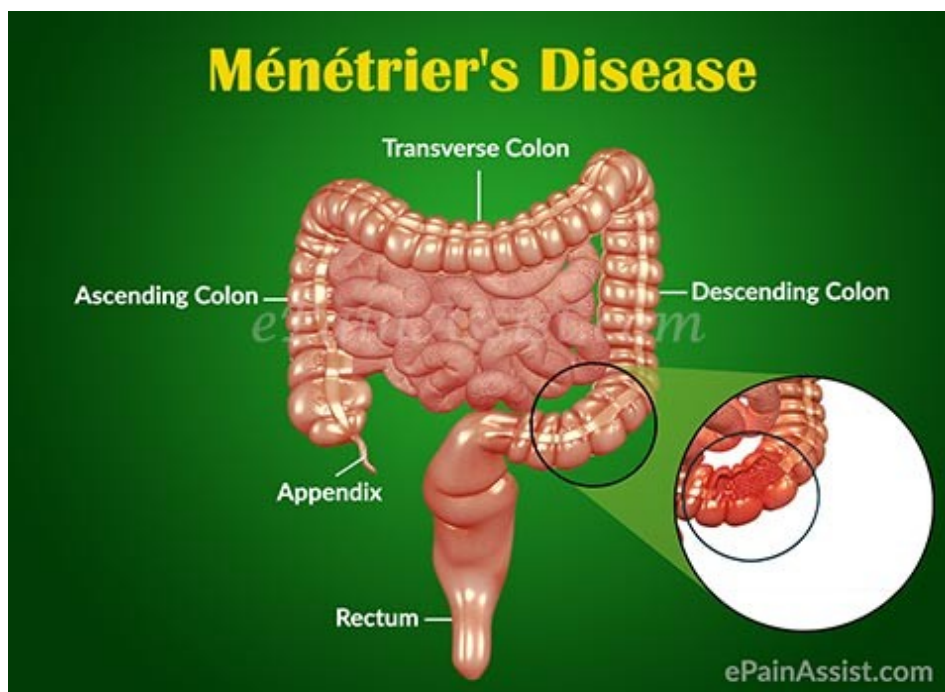
SCIENCE

"It isn't about why...it's about why not!"

Menetrier's Disease

-Anirudh Gupta, BSc year III

It is quite baffling to see that even in this day and age of medical advancement, there are still so many diseases and disorders which are unexplained and, for the better part, untreated. Despite the higher end medical facilities available, some conditions are rare and remain elusive. One such condition is Menetrier's disease (named after the French physician Pierre Eugène Ménétrier), also called Hypoproteinemic Hypertrophic Gastropathy. Its global incidence is not accurately known, but it is classified as a rare disorder and is featured in the National Organization for Rare Disorders. Moreover, there seems to be a lot of discord when it comes to shortlisting the demographic most likely to contract the disease. Males seem to have a slightly higher risk of getting Menetrier's disease than females, with the average age of presentation being around 50. However, a childhood form of the disorder does exist, and is thought to be genetically inherited, due to the results seen from siblings who develop the disorder as children.



“Chemistry is like cooking (Just don’t lick the spoon)”

The disease is characterized by large folds in the stomach lining, formed by the enlargement of the ridges along the inner lining of the stomach wall. As a consequence of this, there is an over-production of mucus secreted by the rugae (a series of ridges produced by folding of the internal wall of the stomach) causing the proteins from the blood to leak into the stomach, leading to a deficiency in the amount of protein (hypoproteinemia). Another consequence of the disease is the decrease in acid production by the stomach.

This is a very rare disorder and the cause/s of it is still largely unknown. Most scientists agree that the disease seems to be acquired rather than inherited; however, cases seen in very young siblings suggest that there might also be genetic factors at play. So far, *Helicobacter pylori* has been associated with the disease in adults, and infection with Cytomegalovirus (CMV) in children, but this is not known for certain due to the vast inconsistencies in the presentation of the disorder across individuals.

The main symptom of Menetrier’s disease is pain in the epigastric region, which is the upper middle part of the abdomen. Other than the abdominal pain, nausea, vomiting, diarrhea, anorexia, anemia, and hypoproteinemia are seen as some of the common symptoms. Menetrier’s has also been linked to edema due to the protein loss.

Due to the general nature of its symptoms and the similarity between the presentation of this disease and many others, efficient diagnosis is very important for any sort of relief to be provided. The main diagnostic method involves the use of X-rays to visualize the folds of the stomach, usually by means of a CT scan. Other tests include screening the serum for albumin levels, which report a low value in the case of a positive result. Upper gastrointestinal endoscopy and histological analysis of the stomach tissue act as further confirmatory tests.

Not much is available by way of treatment, which is unsurprising considering the lack of knowledge available about the disease itself. One of the drugs often prescribed is the monoclonal antibody cetuximab, which acts by blocking the Epidermal Growth Factor Receptors (EGFRs). Antibiotics against *H. pylori* have been used as well. Blood and protein transfusions are often needed to compensate for the protein and blood loss, incurred due to over-secretion of mucous and gastric bleeding. Symptomatic relief for the gastric ulcers which often accompany this disease is also provided. Doctors usually recommend a high protein diet to compensate for the loss of serum proteins.

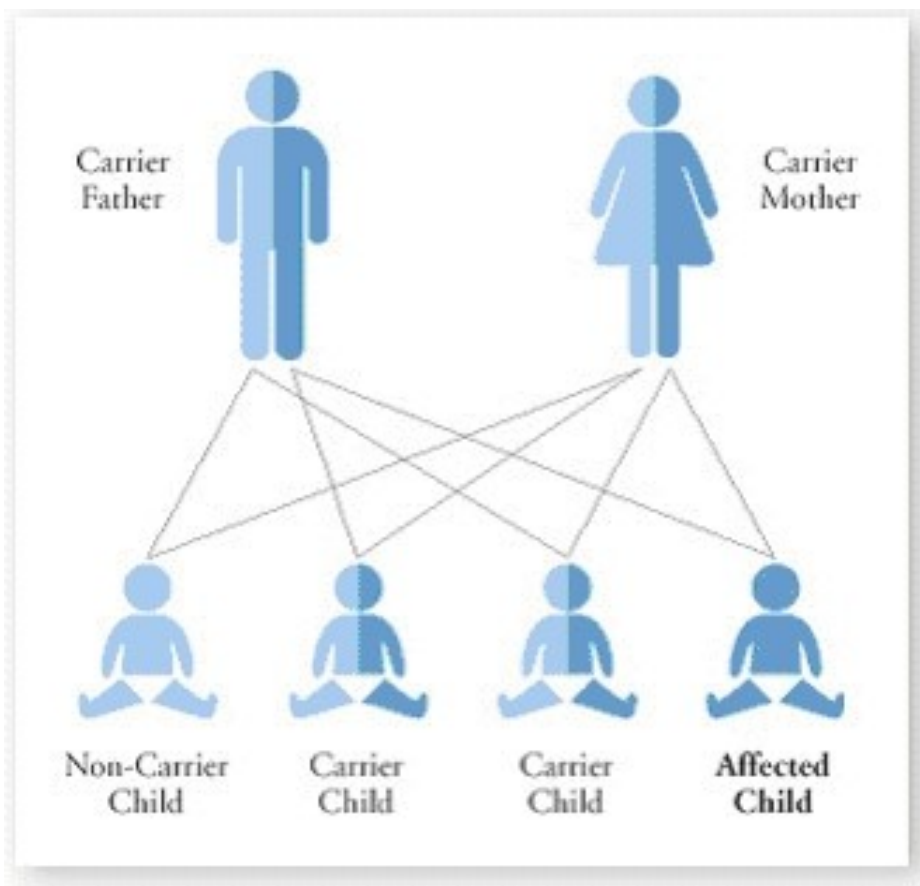
“Never trust an atom-they make up everything.”

Genetic Counseling

- Greeshma Joseph, BSc year III

The modern world is constantly changing, and so too are the technologies, food habits, lifestyles, and everything else associated with the human civilization, which also includes the occurrences of varied types of diseases. For some time now, genetic diseases have come to be of a grave concern, moving into the limelight where more conventional disorders once stood. This has also meant that more diagnostic and prognostic options are available for individuals facing such conditions, either directly or indirectly. The most prevalent option available for such individuals is ‘genetic counseling’.

Genetic counseling has evolved as times have changed to aid individuals in dealing with genetic disorders. The National Society of Genetic Counselors (NSGC) has defined genetic counseling as a process in aiding people to comprehend and adapt to the medical, psychological, and familial implications of genetic contribution to the diseases.



“Unlike protons, I don't deal with negativity”

It is estimated that about 10% of all sperm and 25% of all mature oocytes have some chromosomal abnormality or the other, resulting in a considerable possibility of offspring with genetic disorders. This puts the parents and other concerned with the newborn under great stress in terms of the diagnosis, treatment and related aspects. Thus, genetic counseling is becoming very important. Broadly speaking, there are three main cases where genetic counseling is employed:

- When there is a family history of genetic disorders
- When there are prior instances of children born with genetic disorders
- In the case of advanced maternal age

The gynecologist and the obstetrician would usually suggest the help of genetic counselors in relevant cases, if they see the need. Preliminary diagnostic tests are conducted to determine the health of the fetus during conception and the early stages of pregnancy, especially if there is a history in either of the families/parents. Several molecular and genetic tests are available for prenatal diagnosis. “Down's Syndrome” (DS) effectively illustrates the importance of Genetic Counseling. DS is caused by a condition known as trisomy 21, in which the individual contains one extra copy of the 21st chromosome (3 chromosomes instead of 2), leading to many defects. If a child is born with DS, it will affect the family for their entire life in many ways, all the way from medical to financial to social. But what if the family knew about it earlier? That is where genetic counseling comes into the picture: it allows parents to be well aware of the situation at hand and make an informed decision. In the example mentioned above, the parents would be aware of the difficulties their child and themselves would have to lead, and could choose to abort the fetus at an early stage of pregnancy, making an informed decision.

Genetic counseling has become an essential medical tool to aid people in making informed decisions about the various genetic disorders which may have an impact upon their life.

EVENTS

Indo-Japan International laboratory inauguration and Symposium on Traditional Medicines and Modern Biotechnology

The School of Life Sciences (SLS), Manipal University in collaboration with the Department of Biotechnology (DBT), Government of India and National Institute of Advanced Industrial Science and Technology (AIST), Japan organized a 'Symposium on Traditional Medicines and Modern Biotechnology' on the 4th of August, 2016 to mark the inauguration of the fourth 'DBT-AIST International Laboratory for Advanced Biomedicine (DAILAB@MU-Manipal)', and the first at Manipal. This collaborative arrangement between the two Institutions is aimed at an exchange of research knowledge, expertise, education and training in areas of mutual expertise in the Biomedicine domain.



Dr. H. Vinod Bhat (Vice-Chancellor, Manipal University, Manipal), Dr. Yoshihiro Ohmiya (Director, BMRI-AIST, Japan), Dr. Yoshiaki Onishi (BMRI-AIST, Japan), Dr. Ramjee (Director, International Relations, Manipal University, Manipal), Dr. Sunil Kaul and Dr. Renu Wadhwa (AIST, Japan) graced the occasion in the presence of Dr. M.S. Valiathan (National Research Professor, Manipal University) and Dr. K. Satyamoorthy (Director, SLS, Manipal University) and signed a memorandum of understanding.

Traditional medicine is currently at the forefront of modern Biotechnology through the targeting of metabolic pathways of the molecules involved, using multi-disciplinary approaches. The subsequent symposium on traditional medicines and modern biotechnology brought together researchers and experts of international repute such as Prof. M.S. Valiathan, Dr. Ohmiya, Dr. Onishi, Dr. Kaul, Dr. Wadhwa and others, along with the students.

The symposium was organized by SLS, Manipal University with support from AIST-Japan, DBT-India and Manipal University.

After the informative Symposium, we had the opportunity to have a discussion with the researchers from Japan. They spoke at length about the various roles they perform at the National Institute of Advanced Industrial Science and Technology (AIST) Japan, the DAILAB collaboration, their research work, and gave valuable suggestions to the students of Manipal University and the scientific community in general.



Farewell to Professor Gopinath

Professor P. M. Gopinath, Senior Scientist, School of Life Sciences, Manipal University, retired from service after 14 years of valuable contribution to the development of the Institution.

The School of Life Sciences organized a farewell and felicitation function to thank and honor Prof. Gopinath on May 18, 2016.



INTERVIEWS

A conversation with Dr. Angela Brand and Prof. Helmut Brand

- By Anirudh Gupta, BSc year III

In the April of 2016, School of Life Sciences hosted Dr Angela Brand and Professor Helmut Brand, two eminent researchers in Public Health Genomics and Personalized Medicine, from Maastricht University, the Netherlands. During their stay at Manipal, they had interacted with research scholars, students and faculty and also graced our Annual Day celebrations this year. It was thus inevitable that we spoke to them at some length about the various roles they held, their interests and thoughts. Here is a summary of those interactions.

Dr. Angela Brand:

Dr Angela Brand had been a paediatrician for quite some time before joining the field of Public Health Genomics (PHG), and so we were curious as to her interest in the field. She was very forthcoming about it, stating that the field of PHG was much more holistically rewarding. PHG allowed her to make a significant difference than sitting in a clinic, because she could work towards drafting policies and improving the lives of many more people than she could have done as a clinical practitioner. She had always been driven to help as many people as she could, which is why she had taken up medicine in the first place, and realised that this way she could help much more.



As the conversation moved on to personalised medicine, she talked about the various opportunities available not only in the field, but to the field. She had a very optimistic outlook on the future of Public Health Genomics and Personalised Medicine, saying that as our understanding of the genome gets deeper and better, so too does our understanding of personalised medicine. When asked if it was feasible to look at something like Personalised Medicine in an ever-growing population, she said that not only was it feasible, but it was also *essential*. Dr Angela firmly believes that as the population grows, the need to target our attention to specific population grows too; since without this kind of personalised effort, the concerns of the individual will be lost in the concerns of the larger crowd.

One of the major issues with Public Health Genomics is the misuse of information. A lot of genetic data are shuttled in this approach, and the general population is quite anxious about where this information is going. Dr Angela acknowledged this risk and anxiety, but said that there was hardly any sector which was risk-free. In fact, she claimed that PHG was not as risky as most other sectors where sensitive information is shared; banking, for instance. She said that contracts and agreements are signed, ensuring that the information is not misplaced or misused. She spoke about the meticulous precautions with which this information is handled, and how it was rare that the information would be ill-used. At the same time, she was aware that there was no perfect field, and said that some risk cannot be eliminated, ever.

We were also curious about the impressive position which Dr Angela seemed to hold, juggling more responsibilities than most. We wondered how she did it all. She told us that the key thing to understand here was that she was rarely called on to attend to all her roles at the same time. She also insisted that if one was driven enough, nothing seemed like too great a responsibility. And that summed up her thoughts for our students as well:

- (a) Remember what is important, and work towards it.
- (b) Start early, gather knowledge and be driven about the area of interest.

Prof. Helmut Brand:

We asked Prof Helmut Brand questions along the similar lines as those of his spouse Dr Angela, inquiring about his work and his drive. He spoke about European Integration in Health, telling us exactly what it was and what it implied.



European Integration in Health, he told us, was a way to include the technology and research of countries across Europe to better understand the diseases and treat them. He also talked about the kind of political dynamics which exists between countries, expressing his distaste at the way in which politics and bureaucracy had somehow taken priority over the health of the individual. He hailed European Integration in Health for their effort to make the patients' health important again.

Prof Helmut had had a long standing interest in Integrated Medicine, as far back as in time during his masters. He told us that his interest had developed from the need to see medicine expanded beyond the clinic and the hospital. He had realised early on that there were a lot of restrictions preventing the medicine from helping as much as it really could, and drew from tales of his childhood to illustrate his drive for making the medical community and the field itself more accommodating.

His impressive resume features the Jean Monnet Professor title, and we got curious about his roles under that title. He talked about what it meant to be a Jean Monnet Professor, saying that it was the responsibility of the Professor to focus on the integration aspect of the field in which they were working. He talked about his own mission in helping the integration work to its maximal capacity.

We were curious to know how he managed all of his varied responsibilities, while doing his part for the European Integration. He illustrated that his European Integration profile was more or less like an umbrella under which came all his other responsibilities. He too stated that not all responsibilities came up at once, except at times when things get a bit hectic. Prof Helmut told us that his priority most of the times was his research, as that was his main drive. Avidly declaring his priority for good quality science as a scientist, he professed that he was not a policy maker, and liked to leave that to the people who best knew how.

When asked to say a few words to our students, he asked us to be driven, always. He also asked us to know what we want to do and to be honest to ourselves, and to never be afraid to ask questions.

Dr. Yoshihiro Ohmiya (Director, AIST, Tsukuba):

Dr. Ohmiya talked about his role as the Director of AIST, telling us that his main responsibility was to look after the policies of the Institute. The policy entails that AIST becomes an innovation hub, connecting academics to the industry, and further connecting Japan to other countries of the world, thereby bridging gaps in science, to help build a better future. He spoke passionately about his - and, by extension, the Institution's - aim to encourage students to get into research and to innovate.

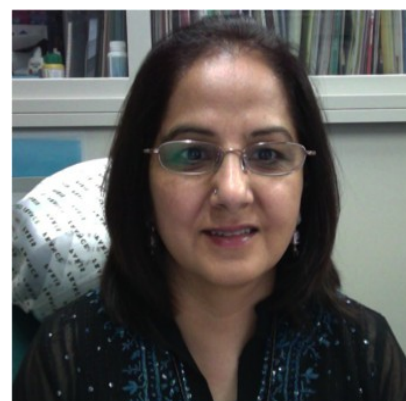
He also spoke about his research in the field of bioluminescence. Dr. Ohmiya has great passion for basic research, going so far as to call it his hobby. He has close to three decades of research experience in the field of bioluminescence. He is highly inspired by Dr. Shimomura, who instilled in him the importance of questioning and passed on his own passion into Dr. Ohmiya; a passion that he wishes to pass onto the newer generations to follow. He talked about the various applications of bioluminescence research, such as imaging and drug screening, and how there was hardly any research being done in this field about 20 years ago, which prompted him to start working in this field.

We spoke to him about what he hopes to get out of this collaboration of DAILAB with Manipal University. He was emphatic about encouraging young researchers to explore the world of science, and was very forthcoming about helping young students in the field of bioluminescence, telling us that he was willing to teach students how to study the field, based on the considerable experience he himself commands. Dr. Ohmiya stressed the importance of academic curiosity, stating that students need to have curiosity since science is based on it.



Dr. Renu Wadhwa (AIST, Tsukuba):

Dr. Wadhwa has been working on a molecule called Mortalin and on cancer prevention and therapeutics for about 25 years. Pursuant to her lecture on the topic held earlier in the day, she mentioned that her current work centered on Ayurveda. She got her PhD from Guru Nanak University on a topic related to ageing, which she worked on using *Drosophila* genetics. Ever since, she has continued to work on research related to ageing, a field which she says has 100% market value, since everyone on the planet has to age and will always look for ways to improve their quality of life during that period. She also listed the advantages of her research in Ayurveda, since Ayurvedic medicines are usually prepared from natural components and hence do not need the vigorous control measures that are essential for their synthetic counterparts. As a result of this, she says, Ayurvedic medicines can be sold as supplements over the counter, weeding out the often long and tedious clinical trials required to market something as a “drug”. She pointed out that AIST helps in bridging the gaps between basic research on molecules, the molecular mechanisms of their effects, and, ultimately, applications of the molecules in the Biotechnology industry. When asked for a specific message to the students of SLS, she encouraged us to make use of the time and resources that are available here at Manipal. She compared the facilities we have today to those that were available to her when she was pursuing her degree. She implored the students to go further than where the previous generations had gone, to explore more, and to maximize on the opportunities presented to us. She insisted that research should not be “fashion-driven”, but should be based on curiosity, and on a constant “knocking on doors” until they open.



Dr. Sunil Kaul (AIST, Tsukuba):

Our conversations with Dr. Kaul took a slightly different turn, covering a wide range of topics, from his journey to Japan to the ways in which students could avail the opportunities offered by this collaboration.

Dr. Kaul had always been fond of the martial arts, and had attained a black belt in Tae Kwan Do in 1980. He had completed his Ph.D. in Stress Biology from Delhi University, upon which he had received a post-doctoral fellowship in Japan. He was doubly ecstatic, because of the research opportunity, and also because of his love for the martial arts.

Dr. Kaul had a very simple philosophy on the market for Ayurveda, saying that those who believe it, take it, and those who do not believe it, do not. At the same time, he insisted on the importance of exploring and proving the principles underlying Ayurveda, thus making it more widely accepted, and helping the global community in general.

We asked about his work at the AIST. He told us that he had been a Researcher for a long time, but currently he has other roles as well. One of these roles is to assist new international students, helping them with everything from securing a place at AIST to getting them adjusted into the country. He acknowledged that there was a huge cultural shock when coming to work or study in Japan, and he was driven to make the transition as smooth as possible for the students. He also told us about his role in procuring funds for the research at AIST, emphasizing on the importance of funding in research.

We also asked Dr. Kaul the question which had been on our minds for a long time: how do students, especially of Manipal University, get to AIST? In response, he talked about complementary collaborations, stating that they sought to form collaborations where both institutions could benefit from the collaboration. He alluded to the strong epigenetic research being conducted in SLS and other molecular biology and imaging techniques being used in AIST, and suggested that as a possible collaboration area between the institutions. Further, he encouraged us to make use of both private and government scholarships, which were instrumental in the progress of students in the academic field. Dr. Kaul also talked about the various programs under the DAILAB collaboration, such as STAR, STAR PLUS, and CAFE, which provide great support for students seeking to work or study in Japan.

Lastly, we asked him to say a few words to our students. Following along the same lines as Dr. Ohmiya and Dr. Renu, he asked us to never give up and to stay motivated, and to keep “knocking on the door.”



EXPERIENCES

Jinisha Jagan.

MSc (2014-16): Project Semester at the University of Queensland, Brisbane, Australia

The University of Queensland (UQ), where I did my final semester project study, is an Australian research university located in Brisbane, the capital of Queensland. My project topic was related to “Novel interaction of Bcl2 associated athanogene (genes “against” cell death) BAG2 with signalling scaffold protein WDR62” and was guided by Dr. Dominic Chi Hiung Ng, ARC future fellow and senior lecturer, School of Biomedical Sciences, UQ. My study was supervised by Dr. Uda Ho and Ms. Yvonne Yeap, Department of Biomedical Sciences, UQ.

UQ life helped me to discover the breadth and depth of Molecular Biology and its research studies. I should say that UQ strives for excellence through the creation, preservation, and application of knowledge. They have a beautiful campus bound by the Brisbane River on all three sides, and the 114 hectare site provides a perfect environment for studies and research. Since I arrived, these spaces have been of immeasurable importance to me, with friendly passionate people providing emotional support and advice concerning my project.

With two other UQ students I stayed at ‘Fairfield’, a suburb of Brisbane that is situated at the south of the Brisbane river. The wonderful weather and liveliness provided me with a comfortable environment in Brisbane that helped a lot with my work. On my flight back home I was very happy with my decision to do my project abroad and I thank my family, and the Almighty as well.



Ms. Jinisha Jagan (left) also had her friend Ms. Archana Babu (right) for company during her stint in UQ, and has photographic evidence to show for it.





Thank you!

