

Coriander room  
4.10-4.25pm

In line with the concepts of “partnering with students to co-create and transform teaching and learning”, and “taking a research-informed approach to teaching and learning”, we explored with students to share the research they are doing in collaboration with the respective faculty members.

Alisha RAMOS, Shefali BANERJEE, and Ignacio Barranco GRANGED graduate students who participated in the NUS 3-Minute Presentation (3MT) competition. GOH Zhang-He is an undergraduate student who, in September 2018, participated in the first national Falling Wall Competition, which has a similar format as the 3MT competition.

## BEAUTY and the B(R)EAST

**Alisha RAMOS**

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Breast cancer is the most common malignancy in women and the leading cause of cancer related deaths in women worldwide. WBP2 is a novel breast oncogene that is highly expressed in breast cancer cell lines and tissues. It promotes cancer hallmarks such as cell proliferation, migration, invasion etc. Hence controlling its expression is important. In this study we have identified a transcriptional regulator of this oncogene. Silencing of this regulator can regulate WBP2 expression and also prevent its oncogenic activity. Transcriptional regulators of the WBP2 oncogene can function as potential drug targets for cancer therapeutics.

## Fixing the 'LEAK' in dengue

**Shefali BANERJEE**

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The most critical outcome of dengue is Dengue Hemorrhagic Fever (DHF) during which a patient undergoes severe blood loss, organ failure and enters into a state of shock. In the absence of immediate medical care, 20% of dengue cases can be fatal. The basic feature contributing to the complications during DHF arises due to dysfunctional blood vessels lacking their selective permeability characteristics. DHF patients experience a transient event of 'Cytokine storm' during which a slew of cytokines damages the blood vessels rendering them 'leaky'. Therapeutic approaches focused on eliminating individual cytokines have proved ineffective and redundant. Cytokines are essentially proteins and identifying factors which can rapidly regulate the activities of several proteins may be a better alternative approach.

I will introduce you to one such 'micro' factor called as microRNAs in this talk. A single microRNA can control the production of hundreds of proteins in humans and due to their small size and rapid effect are excellent therapeutic agents. In my research done in consultation with Dr Chu Jang Hann and researchers at Justin's Laboratory of Molecular RNA Virology and Antiviral Strategies, I compared the miRNA populations between DHF and healthy conditions and found that one miRNA was missing during DHF. I observed that this miRNA could suppress the cytokines in DHF conditions and restore the permeability characteristics of the blood vessels. I have termed this miRNA as MARIO because like our favorite plumber, this miRNA could single handedly fight off its enemies (cytokines) and repair the leak. My future efforts will be deploying my MARIO to eliminate the leak in clinical dengue cases.

## Over the Wave

**Ignacio Barranco GRANGED**

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Tsunamis are very long waves usually produced by submarine earthquakes or landslides. When these waves reach coastal areas, they can cause lots of damage and losses, as the produced during the 2004 Indian Ocean tsunami and the 2011 Japan tsunami. Understanding the impact and inundation processes produced by tsunamis is essential to assess the populations and governments in areas with high risk of tsunami impact. The aim of this study is to physically reproduce realistic tsunami surf and swash flows to understand better the impact of tsunamis in the coast. Due to the large-scale differences between the offshore processes (tsunami generation and propagation) and the coastal processes (wave breaking, inundation, impact and sediment transport), and because of laboratory dimensions limitations, in this study we focus on the physical reproduction of the tsunami waves reaching coastal areas.

## Breathe Easy: Mitigating Drug-Induced Liver Injury in Tuberculosis

**GOH Zhang-He**

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Tuberculosis is an infectious lung disease that affects millions of patients worldwide. Among the many challenges in tuberculosis, the most worrying is the Drug-Induced Hepatotoxicity (DIH) caused by pyrazinamide (PZA) and isoniazid (INH), two drugs which form the backbone of the quadruple antitubercular regimen. The need to reduce PZA- and INH-induced hepatotoxicity is underscored by the lack of equally safe and effective alternatives to the antibiotics used today. Silibinin, an herbal product widely believed to protect against various forms of liver injury, may provide a useful solution given the breadth of its hepatoprotective mechanisms. However, a deeper mechanistic understanding of silibinin's hepatoprotective ability is needed to implement this strategy on a wider scale. In consultation with A/Prof Ho Han Kiat, I proposed a research focus to profile silibinin's role in mitigating PZA- and INH-induced hepatotoxicity by characterising silibinin's hepatoprotective mechanisms.