

## The Two Toms in Thailand

**A brief summary from Imperial College London 'medical students to be', Tom Hughes and Tom O'Connor describing their work in Thailand, prepared for the AMMF Information Day 2016 attendees:**

As prospective medical students for Imperial College London, we were offered the opportunity to defer our place until October 2016 in order to do an overseas research placement for six months.

At the end of the interview, to cement our place on the programme, we were given a rundown of each country and the research taking place there. On the list was Khon Kaen, Thailand, with research in cholangiocarcinoma. Needless to say, we hadn't heard the word before but the idea that the prevalence of the disease can be reduced by ensuring that the rural Isaan people are aware of the risks of raw fish, infected with *Opisthorchis viverrini sensu lato (OV)*, was an exciting prospect.

Spending six months in Thailand certainly didn't dissuade us either. Later that day we both received emails explaining that, after considering our interviews, we had been chosen to go to Thailand if we still wanted to.

The experience started two weeks later back at Imperial College where plans were being made with the Wellcome Trust to set up a conference in Thailand which would bring people from all sorts of backgrounds including medicine, anthropology and sociology together to discuss the different issues surrounding CCA and how we could progress on the issue and work to improve any shortcomings that previous projects had had.

In November we returned to London once more, for a month, to learn basic lab techniques and read up on CCA and the problems surrounding it. With such little knowledge of the issue, we didn't understand the complexities surrounding the eating of raw fish, and the integral part it plays in many people's lives. The more that we read, the more we started to understand the problem and how important further research is for battling CCA, particularly diagnosing it early, in order to maximise the possibility of successful surgical intervention.

At the start of January, we arrived in Thailand and were introduced to the Cholangiocarcinoma Screening and Care Program (CASCAP). We then began learning the different ways in which CCA is researched, as well as going into villages in various districts in Khon Kaen province, to help with the collection of samples (blood, urine and faeces) and witness the education programmes and the portable ultrasound screenings.

The following gives a brief summary of what we did each week, and how it relates to CCA research.

*Week 1:* This week consisted of giving a **presentation on microRNA** (we later found out our research would be on miRNA) which is now being investigated as a potential biomarker due to its stable presence in body fluids, and that some miRNA is overexpressed as CCA develops. On the Sunday **we went to a village in Ban Wa** to see sample collections and help with the processing back at the lab, which is a chaotic rush to prevent sample degradation.

*Week 2+3:* We practiced RNA extraction for our experiment and learnt about **immunohistochemistry** which involved staining a protein in CCA cells using antibodies specific to that protein and seeing how expressed it is by the intensity of the colour. This also allowed us to see cells in various stages of CCA progression including inflammation and hyperplasia.

*Week 4:* **Western blot** which we used to detect a specific protein in tissue homogenate that is overexpressed in CCA by separating all of the proteins out and using an antibody and chemical to visualise the protein we were looking for and went into a village again to collect samples.

*Week 5+6+7:* We read several journals which laid the foundations for our research (miRNA and CCA correlating with renal dysfunction) and presented on those. We then began to write our proposal, before presenting it, looking at the expression of **miR192 in the urine of individuals with periductal fibrosis (PDF) and without, and the levels of creatinine and albumin in the urine and serum to determine whether there is a decrease in renal function for individuals with PDF.**

We also learned urine microscopy used to determine whether villagers giving the samples have renal disorders.

*Week 8:* we went to **the villages** and saw the posters and stalls set up **to educate about CCA** and the risk of eating raw fish. We also **saw the ultrasounds being performed** on individuals with *OV* infection to check the extent of the infection and whether they have tumours. The ultrasounds were understaffed considering the volume of patients, with doctors seeing 3 patients at once and doing hundreds per day.

*Week 9 + 10:* we learnt about **FECT**, a technique used to observe *OV* eggs under the microscope and to determine the intensity of infection. We then set about doing 50 samples ourselves for a range of parasite eggs.

*Week 11:* **ELISA** technique used to determine the level of protein in serum samples to see the increasing expression as CCA progresses.

*Week 12+13+14:* **Selecting our samples** to be used for our research project and ensuring that normal vs PDF individuals are matched for age and sex.

*Week 15:* The conference<sup>1</sup> that had been in the making since September 2015 now took place at the Pullman and had a day talking about the medical facts on CCA and then a day of the sociological, ecological and anthropological sides to CCA and the problems that public health campaigns have had in the past.

The final day summarised the proceedings, allowed for discussion in how we should progress and looked at the grants we could possibly acquire.

<sup>1</sup> *"International Workshop on the Medical, Social and Anthropological Aspects of Cholangiocarcinoma", Khon Kaen, Thailand, 25 – 27 April 2016*