

# Thrills and Spills – A Research Year at Duke University

Text and photos by Joshua Chua

*After a compressed two years of clinical and basic science education, the students of Duke-NUS Graduate Medical School are sent off into a seemingly alternate universe of scientific inquiry and research. For many of us who have just come out of a busy curriculum, this research component of our education makes us giddy from the excitement of having a flexible schedule, a chance to take care of our declining health and to make sudden reappearances in forgotten social groups. However, it is also an opportunity for an adventure in the world of academia and for a small number of us, to explore the world of Duke University.*

As the lush deciduous trees of North Carolina swept past the window of my speeding cab, feelings of excitement oscillated with trepidation as I looked forward with anticipation to spending a year in a new environment so vastly different from home. I had just arrived in the city of Durham, where Duke University is located in, and was looking forward to starting work in the very exciting and rapidly developing field of immunotherapy and brain tumours. The lab that I was assigned to had a few clinical trials going on for their vaccine against glioblastoma multiforme, and had even been featured on various news channels such as Reuters and MSNBC. To say I was thrilled to be working at the cutting edge of science was an understatement.

Like most Duke medical students attached to labs, I was given an opportunity to lead an independent project. It was a complex one involving several animal procedures, gene therapy and immunotherapy all in one sitting. Each step was truly fascinating – an opportunity to manipulate and test things from the molecular world, the cellular world and in the animal model. It was certainly a great start to an eventually fruitful year.

## Vibrant campus life at Duke

One of the highlights of spending a year at Duke is the vibrant campus life there. Duke is incredibly proud of its basketball team, and it is important for every Duke student to watch at least one of their games to bond with fellow students and revel in college pride. The Duke students, decked in school colours, are packed into a section called the Cameron crazies, where they are expected to go berserk supporting their team. Cheering and jeering are expected to be done in the most obnoxious way possible, while students who go the extra mile by painting their whole body blue are rewarded with face time on the Jumbotron. The most entertaining activity, in my opinion,

was the student-coordinated distractions during penalty shots. As an opposing player concentrates on executing his free throw, boisterous students would begin making strange noises and confusing coordinated arm movements in an effort to break his concentration. I was always impressed when the opposing player makes the shot successfully despite our best efforts to thwart it.

Other than a dynamic sports culture, the campus also has beautiful architecture such as the Duke University Chapel – a collegiate gothic-styled cathedral with high arches, a 50-bell carillon and traditional pipe organs. Every week, they hold traditional church services there, complete with a superbly led choir and a church organist who is a music professor of Organ Studies. The chapel is certainly worth a visit, if not for the architecture or the church service, then at least for the music. Dr David Arcus, the organist, takes complete reign of the pipe organ's versatility to yield modernistic arrangements of classic hymns, and the highly trained choir deftly executes complicated religious music with great emotive and reverent balance. This, coupled with the resonant acoustics of the high vaulting cathedral, make the choir's musical voices at their most delicate phrases, sound like they are descending earthwards, bringing Renaissance images of singing angels to mind.

## Bitten by the science bug

The main highlight of my year at Duke was the opportunity to lead an incredibly exciting project. It was invigorating to design experiments and attempt to answer a few compelling questions in the field. Besides picking up a number of skills in different molecular and cellular techniques, I had the opportunity to manipulate genes, work with RNA, develop animal procedures, and at times, take a step back in deep appreciation of some of the more complex experiments. I remember holding a tube of precipitated DNA in my hands, thinking how amazing

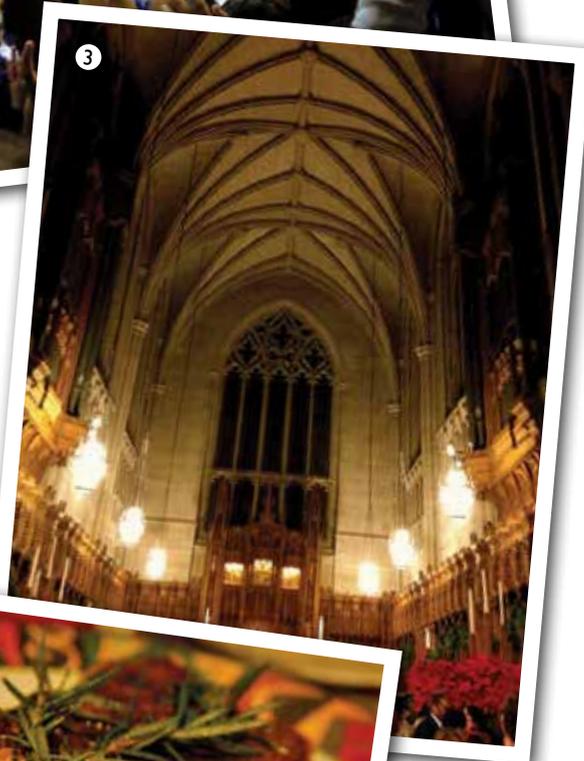
it was to have extracted and expanded this particular DNA, and insert it into the genome of an immune cell. I had always thought this was something only advanced researchers could do, but there I was, holding that piece of DNA in my hand, ready to do what I thought was out of my league. The experience was pretty humbling.

The satisfaction of finally getting an answer to the question I had all year long was my most exhilarating experience at Duke, especially since it occurred during my biggest experiment. It was a month-long multistep process and I had already burned the midnight oil for days over long animal procedures, fastidious wound suturing that would withstand weeks of gnawing, and tedious genetic work. On the night I was collecting the results of this lengthy experiment, I was anxious to find out what the results would show. My heart pounded as I keyed each data value into the software programme. When the data entry was completed, time suddenly slowed to a crawl as I took a long deep breath and clicked to run the graph. A moment of silence ensued before I fired up with joy as the good results of the experiment sank in. I had to stop myself from sharing such fantastic news with my mentor at 2 am in the morning – I simply couldn't believe such a complicated experiment turned out to be successful!

### Taking a break

Like many American cities, Durham has good shopping, such as discount stores and outlet malls. I decided to take advantage of the economical prices to learn some culinary arts. Expensive cookware, like Le Creuset Dutch ovens, could be bought at outlet malls at a fraction of the price elsewhere. Furthermore, high quality meats like USDA Prime meats are both freshly shipped and discounted at excellent stores like discount warehouse Costco. As a result, attempting fancy dishes is extremely accessible to the amateur. An incredibly seared buttery USDA prime rib-eye paired with a bottle of wine from Costco made for a truly delectable dinner at home!

North Carolina may not have famous tourist attractions, but it is close to a few states which do. A three-hour road trip can land you in Washington DC, where you can visit famous landmarks such as the reflection pool in front of the Lincoln Memorial. The stillness of the pool might tempt you to jump in and recreate a scene from *Forrest Gump*. Another popular tourist attraction in DC is the Cherry Blossom Festival, when hundreds of cherry trees around the capital burst into a beautiful sea of pink for a week. The sight of this is truly amazing and especially picturesque – like a scene from a romantic movie! But timing your visit right is very important. Our class trip was one week shy of the peak period for these cherry blossoms, and we were rewarded with only three blooming trees found serendipitously on our journey back home.





Another great vacation destination (that no one should miss!) under an hour by air from Durham is Orlando, Florida where Disney World and Universal Orlando Resort call home. The theme parks are so incredibly well designed and impeccably run, with extremely creative rides and many attractions catering to all sorts of interests.

One of the more notable attractions is the popular Wizarding World of Harry Potter, located in Universal Orlando. When the Universal Orlando gates open in the morning, there will be a mad rush towards the Harry Potter park. On your journey there, you will invariably come across scenes of crying children who have lost their shoes as parents frantically drag them along; near-breathless teenagers bent over in pain and sweat telling their more athletic friends to leave them behind; and cackles of children decked out in Harry Potter gear screaming as they scramble towards the Hogwarts castle. I would refrain from commenting on whether our group of mature medical students joined this feverish fracas, but I would say that arriving at Harry Potter land was truly a breathtaking moment. As familiar scenes of Hogsmeade Village came into view, the magic

and nostalgia of the fantasy series hits you instantly – the buzz was ecstatic! The stores that lined the walkway were incredibly authentic right down to the uneven glass panes, ageing copper pipes and the weathered wood panels. These meticulous details convincingly recreate the magic for visitors!

### All good things must come to an end

At the end of my year at Duke University, as I turned off the lights in my lab and the sounds of the imaging machine died down, I could not help but feel a little sad that I might not be able to enjoy the exhilaration of research for another couple of years. This year had certainly been an eye-opening experience, in terms of experiencing life in a new city as well as participating in the exciting field of cancer research.

As I pondered the significance of the research year in my curriculum, a quote came to mind:

*“What fascinates me in life is being able to collaborate in a task, a reality, more durable than myself: it’s in that spirit and with that in mind that I try to perfect myself and acquire a little more mastery over things. If death attacks me, it leaves untouched these causes, and ideas and realities, more solid and precious than myself.”*

– Pierrer Teilhard de Chardin

Even though it was brief, this year was undoubtedly filled with fond memories and a deep fulfilment in knowing that I have learnt so much. I may not have contributed to the field in a major way, but it was exceedingly meaningful to have played a small role in furthering what might be a game changer in cancer therapy. It was, unquestionably, a truly rewarding year. **SMA**



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### Photos

1. Precipitated DNA in an Eppendorf tube
2. The exhilaration from supporting Duke Basketball is contagious
3. The awe-inspiring Duke University Chapel
4. Nothing beats a home-seared USDA Prime steak
5. The magic of Disney World inspires the kid within you
6. Enjoying a delicious mug of Butterbeer at the Wizarding World of Harry Potter
7. Cherry blossom trees at the Sarah P Duke Gardens
8. The famous Reflecting Pool at the Lincoln Memorial