

MISTI Singapore

A Guide for Future Students

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(a) SUTD



(b) Bali



(c) Zirca

Experiences Singapore was a delight, from the amazing people to the delicious food I couldn't get enough and am already missing my time there. **a:** During the second week we went on a tour of Singapore with our SUTD 5th Row teams. **b:** Some MIT students went to Bali. Here we are on our way back down Mt. Batur. **c:** Singapore has a vibrant night life, this including the many clubs. This is Zirca, in Clarke Quay

Online

Impressions, observations and adventures in Singapore can be found on my website: <http://bahanonu.com/syscarut/singapore/>. They also contain select images from our many adventure in and around Singapore. I have included this in lieu of attaching a plethora of photos to this report. It can also be used as a reference for future MISTI-Singapore students, or those just interested in visit the country, as it includes many snippets of the food, places, and events sprinkled throughout the country.

Overview

Singapore is a nation undergoing change and has become a star player in world commerce and business. Reading Lee Kuan Yew's *From Third World to First* gives one an impression of just how rapidly changed occurred and all the challenges this tiny nation overcame. In addition, it is an eclectic mix of influences that exists in relative peace. For these reasons, I originally wanted to visit Singapore, to learn more about how they balanced the many different groups—from Chinese to Indian to Malay—living in such tight quarters and observe where the country is heading. Also, I heard the food is sumptuous.

The MISTI-Singapore program had us working with students at SUTD in addition to working at a summer internship, the experience turned out to be very rewarding. At SUTD I was able to work with students to help them figure out ways they could start new student groups or just discussing my experiences at MIT. While the leadership program seemed to accomplish it's goal, there are areas for improvement that will be discussed.

Working at Temasek Life Sciences Laboratory under Ian Cheong (ian@tll.org.sg) allowed me to work on techniques that I had not used before while introducing me to a group of labmates who taught me a great deal about Singapore and her culture. The project's aim was to encapsulate Pomalidomide, an anti-cancer immunomodulator currently in trials, in liposomes, which are artificial, spherical lipid membranes. It had previously been shown that the anerobic bacteria named *Clostridium novyi* disrupts liposomes by release of liposomase while also destroying the oxygen-deprived central region of tumors. By combining encapsulated Pomalidomide with *C. novyi*, we hoped to deliver a one-two punch that would kill the inner core of the tumor while increasing the immune response would lead to destruction of accessible outer core. Things didn't quite go according to plan, but a lot was gleaned from the study.

SUTD

Tom Magnanti met with us early in the summer and it was quite informative. He gave us a clear run-down of the history and vision of the university. SUTD was created as a way to boost the number of students attending universities in Singapore but instead MIT proposed (around 2008/2009) to Singapore that it should create an elite university. The vision is different than other universities in that it is very design orientated (classes are taught in fifty student cohorts that work actively, instead of passively, with the professor), there is a three semester froshmore (freshmen+ sophomore) year, the different years are at staggered schedules so the campus is never dormant and other aspects. Susan Hockfield gave a speech at SUTD about education and technology, and any future MISTI-Singapore students should find the transcript. Many of the challenges she faced instituting reforms at MIT are applicable to SUTD.

Part of the MIT-Singapore program is devoted to the 5th row program, which is SUTD's initiative to help build campus culture outside of the four core academic pillars. MIT students have been sent

to help the new students and lend our wisdom so they have a better chance of producing a strong campus. Nate and I were the white team leaders. Our nickname was Team White Ninja. Our team was awesome and consisted of several students with a diverse set of interest: tennis, water sports, game design, a cappella and electric vehicles. Throughout the summer we participated in several activities, such as an initial one in which we hopped around Singapore finding clues from a list. This allowed us to spend time getting to know our group members while also exploring the city.

Other events were more focused on the clubs, such as when we split into teams focused on different aspects of the club-creation process: finance, pitching, constitutions, etc. During one session, I mainly helped Keren Wang look at the Korean club finances and suggest some alternative ways to get funding. The funding aspects of clubs might need to be tweaked, the Excel spreadsheet they gave was a bit finicky and SUTD should have a couple workshops to make sure students are at least familiar with functions and macros in Excel, Word and PowerPoint. Also, for future MIT students, it is better to give the SUTD students slight suggestions and hints then see where they go. It prevents us from imposing MIT's culture and ideas on them instead of letting them adapt.

Saif Benjaafar, a new SUTD professor, gave a presentation on strategies he employed to recruit faculty members at UMN to the new department he founded there. We used this as a basis to help the SUTD students find out-of-the-box solutions to their funding and membership problems, such as re-branding club time commitment and who they went to for funds. I worked in the Athletics group with Marvin, cycling; Vera, badminton; JX, netball; Xulu, billiards; Aaron, volleyball; and Ian, tennis. Having a speaker present their ideas and the results is very effective and provides a clear basis we can use to start discussions. This should be done more often with different professors at SUTD. Further, the speaker should stay and actually interact with the students, providing another resource that can be called upon in the future.

Sanjay Sarma, director of the MIT-SUTD Collaboration Office, met with us several times both before the program and during our time here. Attend these sessions, he's brilliant and you'll come away knowing something new or having a fresh insight. During one of the meetings in Singapore we talked about the progress being made by the SUTD students, how we were impacting them and future directions. It was noted that SUTD students appear to have a fear of speaking in big groups, which derives from their fear of failure and the constant competition encountered here. This seems in contrast to MIT, where collaboration is encouraged and failure is a badge of honor, indicating you took a risk and learned something. Because it is so ingrained in our culture, it might be hard for MIT students to translate that attitude without more formal guidance or a better game-plan going in.

Thus, a possible goal is have the leadership program be a safe space at SUTD that gives students a test-bed from which they can launch more ambitious ideas. In addition, I encouraged Sanjay or others to ask the administrators to do away with or modify grading curves currently in the system as this only leads to excess competition, which is against MIT's spirit of collaboration.

The current crop of students will have to be in an internship for a while and SUTD is in the process of securing jobs for them. They should be responsible for finding at least some of their job opportunities, as most MIT students do. This would give them actual experience in job searching and acquisition, something that cannot be taught. This may lead to headaches up front, some will argue it places an undue burden, but should benefit them down the road. The MIT Alumni association in Singapore and others can act as SUTD 'alumni' until the school has a more solid reputation and network.

Several programs may be implemented to provide a broader set of opportunities. A SISTI program could operate like the MISTI program at MIT to help send the students abroad (I know the

Korea club could benefit tremendously from this) and 'VentureShips' could to help fund students who want to go into business. And lastly, better coordination between MIT student's internships and the 5th Row program will help us devote more time to improving SUTD.

Temasek Life Sciences Laboratory

Ian Cheong's lab works on drug delivery and specifically using liposomes to deliver drugs to tumor sites with increased specificity and reduced toxicity. Liposomes are artificially created lipid bilayer spheres. Different types of lipids can be used to make the spheres and these will alter properties such as size and membrane permeability. Other drugs have been successfully encapsulated. Doxorubicin is used to treat ovarian cancer and was encapsulated to form Doxil (liposomal doxorubicin HCl). This has been seen to have reduced toxicity and without concomitant reduction in efficacy (OBrien et al., 2004). My project was to encapsulate and deliver Pomalidomide to tumor sites. Pomalidomide has a less favorable chemical structure, but we tried several methods to encapsulate it (to be detailed below): liposomes, microemulsions, cyclodextrins and copolymers.

Pomalidomide has been previously shown to reduce metastatic potential in mouse lungs implanted with colorectal carcinoma among other studies (Liu et al., 2009). In addition, it has entered phase 1 and 2 clinical trials, indicating its potential as a new cancer drug. However, these come with caveats. It has numerous side effects: peripheral neuropathy, deep vein thrombosis, possibly acts as a human teratogen and other problems. Because of these side-effects, Pomalidomide may not make it past phase 3 trials despite its potential benefits.

Ian had previously shown that an anaerobic bacteria named *Clostridium novyi* (*C. novyi*) localizes to the oxygen-poor region of tumors. In addition, it is able to lyse (disrupt) liposomes via an enzyme called liposomase (Cheong et al., 2006). We intended to use this method to more efficiently release Pomalidomide at the tumor site because *C. novyi*, and its liposome destroying enzymes, would only localize the tumors where liposomal Pomalidomide should as well through the Enhanced permeability and retention effect. Lyse of encapsulated Pomalidomide should lead to increase immune system response locally, which should destroy tumorigenic cells more rapidly.

The original aim was to make liposomes using the lab's standard method. This involved using HEPC, cholesterol, and DSPE-PEG. The hydrophobic tails of the lipids prevent water from passing through allow me to have a different buffer on the inside and outside. If the differences between the buffers favor Pomalidomide being in the internal media, I would get higher encapsulation efficiencies (amount added/encapsulated). Thus, I formed the liposomes with one buffers then dialyzed in another buffer, allowing for different internal and external conditions. Due to its very low pKa, I tried to acidify the internal environment, which did not work. Because Pomalidomide readily dissolves in DMSO, an organic solvent, I attempted to create liposomes in solutions with varying percent DMSO, which improved the amount of Pomalidomide encapsulated. Many other buffers were tried, but none was able to encapsulate it at the minimum 10% of input Pomalidomide that we hoped for. There were technical details with actually measuring the amount of Pomalidomide in solution that might have contributed to this.

We injected BALB/c mice with CT26 tumors and waited about a week before testing. The encapsulation and presence of *C. novyi* on Pomalidomide efficacy was tested and the initial study with nine different testing groups (n=5 for each group) were promising but inconclusive. *C. novyi* increased lifespan of all testing groups over the control and the encapsulated Pomalidomide with *C. novyi* at low dosage survived the longest, but no cure was seen. After an initial decrease in tumor size, we observed slow tumor growth at the periphery that began to accelerate after several

days. Further, data was skewed by the artificial death of mice—only one mouse died naturally—the rest had to be euthanized in accordance with protocol when the tumors became too large. However, increasing the dose a thousand fold for the unencapsulated Pomalidomide showed no toxicity, which is encouraging and helped further our hunch that just injecting pure Pomalidomide with *C. novyi* might be sufficient.

Working under Ian Cheong (my PI at Temasek) has been great, I've learned a great deal about science, Singapore's culture and other areas from him. He is always in, available for me to ask questions and very knowledgeable about his and related fields. Ian is also keen on doing lab meetings different than most other labs I've worked in. His motto is that people probably know what others in the lab are doing, so better focus on other things. Lab members share a bit about themselves and we then do exercises such as reviewing Bayes' Theorem, probability or particle filters. For any future students, I would highly recommend contacting Ian. He even has some coding project in addition to the more biochemical projects.

Singapore

Singapore is small, and coming from the American Southwest, almost laughably so. Nevertheless, it contains a rich history, varied culture and plethora of activities. Incoming students should not think that Singapore is simple because it is small. I'll briefly discuss Singapore's culture and history then detail an exploration of the city.

A trip abroad would not be complete without learning a bit about another culture along the way. Lunches with Adrian, a Singaporean who works in my lab, have taught me a great deal about their school system, political system, interesting places, etc. In addition, Ian provided a plethora of details about the history and perspective of someone older.

School is broken up into interaction, nursery, primary, secondary and junior high/poly. Children often start in interaction school (partially made-up name, no one would give me a formal name), where they go for several hours to play with other babies. Afterwards, they attend nursery, which is more like a daycare where parents can leave their children for the day. Primary school covers grades one thru six normally while secondary school covers seven thru eleven. Afterward people have a choice of whether they want to go to junior high (more theoretical) or poly (more technical), which award certificates and diplomas, respectively. They are on a Western system more or less: Aug-Nov and Jan-Apr are school and May-July and December are breaks. During primary or secondary school, people often attend enrichment classes during their breaks, which normally meet for several hours three or four times a week. When people get older, their aim for internships and the different junior high/poly schools have varying reputations, which influences what spots you will get. There is no age limit on work, but people will generally not hire the very young. Schools sometimes help students from poor families find work and then arrange with the company to set hours that work around their class schedule.

The government has been allowing increased opposition parties to emerge, but there is still a tendency to use underhanded tactics to pressure people into voting for the People's Action Party (PAP), the ruling party. This includes making the offending district last to receive repairs or other similar actions. Apparently Lee Kuan Yew maintained the British system of imprisonment without trial to swiftly deal with threats and then to release the offenders once their political clout had faded. This was the case with fellow founder of the PAP, Lim Chin Siong, whom he accused of being a communist and detained for a time. It appears that the older generation both admires and fears Lee Kuan but that the younger generation has become more rebellious.

While riding with Ian I asked about how lawyers are general viewed and it seems like their reputation in the USA is not different here: they are viewed as parasites. But it appears that their roll has changed: they are less politically active now than they were in the 1970s (when the government saw them as a threat) and this has been reflected in who they admit to their programs.

The government itself seems to be creating an interesting brain drain problem for itself by leeching the best minds from the private sector to government posts, which are low-risk, well-paying jobs. This leads to a risk-adverse society. Additionally, years of schooling and other people telling these smart, newly appointed officials how great they are makes them less willing to take risks or do things differently. This is reflected in the subdued entrepreneurial culture in Singapore. Also, the government also likes to make some interesting rules, among them the requirement that those under seventeen must be in or with a parent after 2300 or they can be questioned. Brilliant.

The Singapore military is a national institution. Military service is mandatory for all males. This leads to many males being around 21 when starting college while the females are much younger. Talking to several people, it appears that it is common to give Muslims and non-Chinese positions like driving and other lower posts. Driving is often reserved for Malays or Indonesians because that is where Singapore would most likely do much of its fighting and they can speak the native tongue. Recently a Muslim, Ishak Ismail was promoted to general and this apparently caused quite a stir. But the person I talked with about this had met him and said that he wasn't quite the typical Muslim, e.g. he renounced the [given name] bin [surname] that is common in Indonesia for Muslims. This might have been a reason why he was promoted.

Temasek Life Sciences, where I work, is located on NUS's campus. Turns out NUS had several orientation events going on while I was there. Incoming freshmen join teams and compete against one another; the teams are assigned based on faculty (department for those in the States) and dorm/hostel location. It is hilarious to see people running around with green bunny ears, singing nonsensical chants and doing ridiculous events (like trying to spell out words using their bodies). There are different interest groups at NUS which are mainly Buddhist, Christian and other religious groups. Apparently the Christian group is called Crusade for Christ and they were banned for a time after putting up a poster that read, "[insert here] many people live in Taiwan, [insert here] many people are also Christian in Taiwan. There is a lot of saving to do." Wild, wonder who thought that was a good idea.

One of the most amazing things about Singapore is how much they try to ease any racial or religious tensions. Each religion/race is has two official holidays and normally everyone celebrates each other's holidays. In addition, the populace, while clumping quite readily into different groups as is man's wont, can also be seen to visit places outside their cultural zone. For example, at Khansama (the Indian restaurant) there was a large Chinese group eating. Seeing how it appears that only Indians work construction jobs, there still seems to be some divide.

It seems housing it quite expensive here and the rules surrounding it are a bit complex. For example, if you are not married, you won't qualify for government housing (and thus need to buy private housing) and the same is true if a couple makes more than S\$8,000 per month. Government flats normally starts at around S\$200,000 while private ones can be around S\$500,000. That's insane, especially for younger people. This causes many students to staying at home well into their late twenties.

There are a variety of things that gain one tax breaks for in Singapore, among them having a maid. Maids are apparently quite common in Singapore and most come from Indonesia or Malaysia and live with the family. Families have to pay S\$5,000 to the government since the owner is

responsible for the maid and if something happens, they foot the bill. So if the maid becomes pregnant or anything else happens, this pays for the expense. This often leads to tension and people being unsure whether to give the maid the keys for fear they will abuse the house or cause other trouble, leading to monetary losses.

Healthcare in Singapore is a mix of private and government. To avoid the free-rider problem, there is a base set of services provided almost for free by the government, but more costly procedures require a co-pay and emergencies can be paid for out of one's retirement account. Like social security, the retirement account is composed of money taken from one's income; here around twenty percent is removed and placed into the account. It is meant to be locked away until you turn fifty-five, have a medical emergency or need a down payment for a house. Anyways, the healthcare system also has things like tiered wards that run from the nearly completely private (A-level) to the entirely public (D-level), this allows people to pay for better care if they want but ensures some baseline level of care.

While asking Ian about the importation of biological material, he noted that it costs a lot of money to do so and that customs was quite finicky. Often, distributors would wait several weeks until they had a full plane before shipping and may not include the necessary information for the items to clear customs rapidly. Hence it is sometimes necessary to actually send a note to customs with the material safety or other documents to allow timely delivery. Because Singapore is a small country, it also can't import or create a lot of the Big Science that we see in the USA or Europe. They send several scientists abroad to places like CERN so they can take advantage of the resources already available.

Singapore has an IKEA, which is exactly like all the others you find around the world. More interestingly, they have a store called Courts that functions like a mix of IKEA, Best Buy and Wal-Mart.

The Night Safari is awesome. Before entering the safari-proper we saw fire breathers and we were entertained at a small arena by a variety of animals, among them a dire wolf...just kidding those don't exist (except in a Song of Fire and Ice, read the books!), but they had a large white wolf that they brought out. I want one. Anyways, the performance was a hoot. We went on a tram around the safari and at several points got off to see the variety of leopards, bats, and other animals. There were also elephants. Visit, preferably via someone (SUTD student) with a car.

There are hidden gems tucked away in every city, Singapore is no exception. And sometimes the best way to explore a culture is to wander about it without the glitz and glamour of its main tourist hubs. I did so the best way I know how, by wandering through the streets, taking in the sights and sounds that are normally hidden from view, tucked away so the unassuming tourist is left unperturbed and, perhaps, unaware.

The journey started at the Newton hawker centre, located near the Newton MRT stop (surprise!). Ordered carrot cake, which is delicious as always. Afterwards, I wandered toward Little India and came across the Singapore National Eye Centre, whose building is quite amazing. Next to it is a lovely pond; though, like most the water is a bit...janky. Walking north, I passed the Novena MRT stop and encountered a rather nice apartment nearing completion. So I did what any unassuming American would do, I asked to enter.* However, this security guard instead suggested I contact a Mr. Eric Lee. Never did. Anyways, I continued wandering and spotted the United Square Office Building, which has a wedge-like shape. United Square Mall, located under the office building, has

*It didn't work this time, but works surprisingly often in Singapore.

a variety of shops, such as the familiar Toys “R” Us. Overall the mall is nothing special; though, I did come across a door sketchily opening up to the roof. Being Singapore, I decided not to go any farther. Take that advice.

Having finished in United, I ventured toward another interesting sight in the distance, the Novena Square Mall, right above the Novena MRT. It is home to a variety of shops and a dance competition was going on while I passed by. Not sure what it was for, but random entertainment never gets old. After a bit of finagling, I happened upon the National Neuroscience Institute and the Ministry of Home Affairs. The guards at the later building were reluctant to tell me which government building I was ogling at, but then I realized they had the name printed in big, bold letters on the inside. Guard fail.[†]

The swanky apartments dotting the horizon were hard to ignore and there I ventured. Some people were having a small gathering at Ah Hood Gardens. It is nice wandering through these apartment blocks because many are designed with the first floor being an open space that melds seamlessly with the places next to it. It allows you to experience a bit of community life without intruding.

Now, everyone likes shiny stuff. I was about to turn back, having become completely ‘lost’ (deep down I knew where I was) and sweating like no other (hot sun + ridiculous humidity = deodorant fail). But out in the distance, maybe a mile or so away, three towers gleamed with yellow-gold colored tops. A bit later, I was passing the Toa Payoh MRT toward the Toa Payoh town centre, one of the first of its type in Singapore.

Onward! Going toward Toa Payoh sensory park, I passed a series of bland areas and arrived at one of SAFRA’s buildings. SAFRA, Singapore Armed Forces Reservists Association, is an organization that puts together recreational activities for national servicemen. Near the SAFRA building was a sports complex that contained the Toa Payoh Stadium, home to Balestier Khalsa FC. Quick side-note about Singapore’s S.League, i.e. soccer league. There are thirteen clubs, but according to a local, they are not very good and people aren’t fanatical about local soccer the way they are in Mexico, England or Spain. Anyways, it appears that Singapore has started an initiative called Vision 2030 to help promote getting more people involved in sports.

The Toa Payoh Town Garden popped into view. I wandered around for a bit and encountered a group of kids participating in laser tag. After talking to Singaporeans about guns, even toy ones, I was surprised to see this. I returned to the Toa Payoh MRT and headed towards Bugis.

Bugis is centrally located. Sim Lim Square and Sim Lim Tower, electronic mini-Meccas, are both nearby. Wandering over to Sim Lim Square, I entered inside and was bedazzled by the array of electronics on display. Phone covers, video cards, TVs and a variety of other gizmos lined shelves. It was a bit of a sensory overload and took a while for me to filter through the noise and find anything interesting or useful. Sifting through piles of electronics with the warm breath of a salesperson trying to do their job kept things entertaining.

Well, that’s what you can find in a couple hours wandering through Singapore. Get a group of people together and do it, you’ll appreciate the city much more once you do. Even better yet, the SUTDers have a group called Riders of SUTD. They’ll let you borrow a bike (like I did), which will allow you to see even more of the city.

A quick side-note for those who like clubbing, I’d recommend the following: Velvet, Zouk, Future, Avalon, Butter Factory, MINK, Helipad, Attica (meh), Filter (if you’re rich and connected), and

[†]Don’t aggravate guards in Singapore.

Powerhouse. Clubbing was a blast and if visits are timed right, no one has to pay (student nights). Just remember to bring the SUTD card. And shades.

Food

Now onto the food! Singapore has many hawker centers where one can get an amazing variety of food for cheap and offers a lot of choices. Canteens on the NUS campus are akin to hawker centers and are nearly as cheap. This is written in greater detail on my website (and it includes pictures!), but I'll go over some of the foods we encountered. This is organized in a semi-location-based manner.

Singapore has several crazy fruits, such as durian, which is neither great nor terrible. It has a waxy texture (not a particularly enjoyable feeling in the mouth), is sweet and tart, and is pale yellow in color (at least the one I had). Try it for nothing than the cultural experience. And then there is this awesome (looking) fruit called dragon fruit or pitaya. It looks like a crazy pokemon cum fruit, aka the greatest thing in the world. Unfortunately, while even the interior looks sick (in a good way), the taste is sick (in a bad way). Like watermelon that has all sweetness removed. But it has a crunchy texture, so that's a plus. Oh, don't get starfruit juice, it sucks.

In and around the SUTD dorm are many places to eat. NUS's campus is partitioned into different canteens based in each school: Science, Business, Art and others. There is Korean BBQ at the Business canteen where you can get marinated pork with kimchi, anchovies and seaweed soup. At the same canteen can be had a Japanese meal of rice with curry, small slices of chicken, and a fried fish fillet. The Art canteen has an Indian stall with a curry and mutton (a type of biryani dish) dish made of rice, chicken curry, chapatis and some chicken. This was complemented by honey and water chestnut juice, which is sweet but has a refreshing taste to it as well, as if you are sipping from a (clean) pond. The Muslim stall served beef rendang that was served with intensely spicy chili. NUS is a cheap, lazy way to get some food variety, so future students have no excuses.

SUN Asian Bistro, located on NUS, has a nice assortment of food. Bryan, Varsha, Jared and I ordered a group meal consisting of nonya asam fish, cereal chicken (which was served with a dry, but tasty, cereal), and vegetables with mushrooms. Go there, it is quite good and the atmosphere is nice. Adding to the restaurant repertoire, we went to Kim's Family Restaurant with our hostel/dorm manger where we had pork, chicken, a variety of vegetables, some delicious kimchi, muscles, baby squid, and others.

Onto actual hawker centres, i.e. awesomeness. Broadway is a nearby hawker centre (walk down Dover Rd.) that contains a couple shops, mostly Japanese, Chinese and Muslim. Bryan and I ordered dishes from the Muslim shop: roti prata and mee goreng. The roti prata is like an omelet and the mee goreng was a noodle dish with strong spices and a reddish tint.

At the Harbour Front will be the Vivo City hawker centre that has a variety of stalls; though, like Food Opera, it is a bit more touristy in feel.. There was a central building with all types of food: Korean, Japanese, etc. You could either order from a pre-made dish to make your own. Don't order a lot of meat, it is expensive! The atmosphere was hectic, like everything here. Downstairs in VivoCity is Food Republic. You can get tomato rice, which taste pretty good but I recommend you see how the stall prepares its food before you order anywhere. Disappointingly, the tomato rice stall thought using a microwave constituted cooking. Super lame. At a nearby stall you can get Taiwanese screwed meat and scallion pancakes. The pancakes are a bit like tortilla espaÑola, but they are made of dough as opposed to potatoes.

At the Bayfront MRT, the food court in the Marina Bay Mall or in truth almost anywhere, you can find beef pepper rice. It is basically rice with beef that has some seasoning. Some stalls serve you the meat raw, but the plate is super-hot, so you have a limited amount of time to swirl the rice, egg, spices and meat together exactly as you would want. Sizzling curry rice with beef or hamburger steak is a rather good dish. Similar to the black pepper rice, it is often served not completely cooked (and normally includes a partially done sunny side up egg). However, after a furious ten seconds of stirring on the hot plate, you'll be good to go.

Onto Little India! Vivaek took us to an Indian restaurant where we had egg dosa with chicken curry. Get there by taking the MRT to Little India and wander through the densely packed streets with music playing in the background, people walking on the streets, and various smells wafting from the stalls. Taking a different series of turns and you are at Mustafa, an Indian food and shopping centre. We went into the main store and got lost in its endless hallways filled with carpets, dazzling jewelry, succulent fruit, cheap shirts, spices and all manner of other things. If you miss big box, this is a zany, awesome, pretty-much-not-the-same alternative.

Khansama is an Indian restaurant with a menu thirty pages long! It is buffet style, which I think is the perfect avenue to explore six-plus dishes on one plate. I ordered a mango lassi, which is like a mango smoothie, but it was a bit more creamy and delicious. Another ordered teh tarik, which is an Indian tea in milk that they make by pouring the liquid between two glasses several times. Proceeding to the buffet, they had naan (Indian flatbread), papadum (a kind of chip, these were quite spicy), and gulab jamun (flour rolled in a ball, fried and soaked in syrup). There were a variety of rice (white and spiced) and different curry to complement the meal. Overall it was excellent.

To Chinatown! Smith Street Food Centre is off the Chinatown stop and was filled with twenty-plus shops. Holland Village hawker centre is alright and features a good Korean stall serving chicken BBQ and a place to get some really good rice with spicy curry and a bean soup that had this pale-brown vegetable that pops in your mouth.

Maxwell is a hawker centre near the Chinatown stop. You'll encounter Tintin Singapore store on the way, visit the place. Ordered Chinese chicken rice, which was basically exactly as described, but the rice was a little bit more flavoured. Roti prata was once again in order and served with a delicious chicken curry. Lisa bought some cendol to share—it is made of milk, rice flour, sugar, shaved ice and some other ingredients. Another Food Republic is near 313@Somerset with a store that sells mango pomelo sago (a chilled mango soup served as a dessert).

We ventured out to find Chomp Chomp, a hawker centre near Serangoon gardens. Take the red line to the Ang Mo Kio metro stop then head over via bus. When we arrived, the place was packed. You are supposed to find a seat here, order from a stall and they will deliver it to you. But finding a seat proved to be a problem: people are ruthless about protecting their seats. I ordered carrot cake, which consists of egg cooked with different spices and served with shrimp. We also got sugar cane juice, which is intensely sweet and made on the spot.

And here you thought that I'd be done. More food! Sambal sotong rice is composed of squid with steamed rice and the contrast between the sticky, chewy squid and soft rice is perfect. Bengawan Solo is a local store that sells different types of kueh, which are sweets associated mainly with Malaysia or Southeast Asia. They can be all assortment of things, from small cakes to ondeh ondeh, which has coconuts on the outside and chewy green rice flour. They also have pineapple tarts and poppadums, which is a spicy Indian chip/cracker.

Old Airport Road is a popular hawker centre near Mountbatten/Dakota MRT. A native told me to get bean curd, i.e. tau huay. It is a tofu pudding that is served as a dessert. Kaya toast is another

popular food made from kaya (a fruit curd), eggs, sugar and several other ingredients on toasted bread. And then there is chicken biryani, which is a sub-dish in the biryani family of dishes, which normally consists of rice, meat and some vegetables. Chicken karaage is a Japanese dish that can also be had, it contains fried chicken that is then coated in wheat. You will often also encounter nasi goreng: fried rice often served with marinated pork (Korean), chicken karaage (Japanese) or other meats.

Heading over to Raffles Place MRT and walking down Robinson Road, you rapidly approach Lau Pa Sat, a hawker centre at the heart of Singapore's downtown. It is bustling with activity and the center has a stage where cover bands often perform. There are stalls to serve every palate. A Korean stall serves the excellent Bibimbap, a concoction of rice, vegetables, egg and beef.

Food Opera @ ION Orchard (Orchard MRT) is pretty large; though, admittedly a bit touristy and lacking some of the slightly grungy yet appealing feel of other hawker centres like Old Airport Road or Chomp Chomp. There are several good stalls there: BBQ Fish, a drink stall that serves monin soda, and others. Ikan goreng, or fried fish, is pretty good. Finally had nasi lemak there, an okay good dish with rice, fish, beans and some other tidbits along with monin soda/syrup, a delicious bubbling drink with your flavor of choice, in my case passion fruit and strawberry. Kim and I went to Orchard Square and ate at the downstairs food court there, it was less crazy but the Japanese fried fish and rice was delicious.

St. James Powerstation is host to a small number of food stalls (Food Republic), one of which served chicken murtabak, a chapati with chicken fried in the middle and served with spicy curry. The place has a projector with live TV and cover bands. Nice place to visit on a weekday or before clubbing at Powerhouse.

Singapore has numerous restaurants that serve as a more expensive alternative to the cheap (but awesome!) hawker centres. No Signboard is a seafood restaurant chain with places near the Esplanade and Aljunied MRT stops. Din tai fung is a famous restaurant that serves among other things, really good dumplings. And Master Crab, near the Buangkok, serves some really great chili crab, which is a popular local delicacy. Be warned: tourists can get ripped off by the 'market' prices. While I haven't yet been there, Crystal Jade La Mian Xiao Long Bao is a seafood restaurant located near Holland MRT that serves chili crab and other foods. It was highly recommended by a local. Other hawker centres are Glutton Bay (Esplanade), Tekka Centre (Little India), and Bendemeer hawkers centre (Boon Keng).

Abroad! We visited Bali and on our way back from Mt. Batur, we stopped by Bali Agrowisata, Spices and Coffee Plantation that sold Kopi luwak coffee, made from Lubaks, Balinese name for a civet (type of mammal). They feed the coffee beans to the lubaks, they excrete them, and the beans are then dried over a fire and ground into usable coffee. We also had rather sweet lemon grass tea along with robusta, arabica, ginseng and other types of coffee. They also offered us slices of tamarillo and mangosteen, both were delicious.

While in Bali we had a plethora of foods, a sample talked about here. There was tutu ayam, chicken slow cooked for eight hours in various spices. I washed this down with kelapa muda, or a young coconut. For dessert we had black rice pudding, which was really good and had a sweet flavor to it. Nasi campur is normally an assorted mix of rice and other ingredients. Es rumpit laut was a kind of dessert we found on the streets of Gianyar, it is sweet and served with ice. While I wasn't able to have it, locals talked of palak paneer.

I hope that provides a quick overview of the variety of food to be had in and around Singapore. There is so much more than what was described here! There are different Peranakan dishes, food

in Australia and Malaysia and a variety of other dishes and alternative takes on Western dished. I encourage any new students to try something new every day. It is possible and you'll be endlessly better off for it.

Travel

Singapore is fantastic, but traveling around Southeast Asia should also be in order. There are many places to visit, from Melaka in Malaysia to Bintan in Indonesia. Farther off is Australia, Thailand or other places.

We went to Melaka and I would recommend you spend time going to another place. If you are so inclined, journey to the Kranji MRT station, take the 170 bus over to Johor Bahru then hop on a bus at Larkin heading for Melaka. While there you can visit Market Sentral (that is not a spelling error) or the more lively markets at Jonket Walk. The entire city feels quite janky; though, they had some good food like oyster omelets and potato shish kebabs.

Some of us headed over the Bali one weekend and I would highly recommend you go. We arrived in Kuta and then took a van to Villa Puri Purnama, where we stayed for the weekend. Around 0200 we took a morning hike up Mt. Batur and after heading back down ended up in Ubud and watched the informative and dazzling Taman Kaja Community Fire and Trance Dance. The next day we went snorkeling and then popped over to Gianyar City to indulge in the street markets. Cheap food!

Lisa, Corinne and I flew over to Sydney for a couple days. We took Scoot, a new budget airline that offered surprisingly good service for a seven hour flight. We stayed with an Aussie named Mark, this is a much better idea than getting a hotel room or similar. We learned about Australia through him and a Briton, Krista, who was staying with him until she got her own place. Sydney has many places to visit and we attempted to hit them all: Bondi Beach, the Rocks, Paddington markets, Circular Quay, Darling Harbour, Opera House, Manly, Blue Mountains, and Pancake on the Rocks. Exhilarating, cold, and different—it was a welcome break that helped me remember and notice even more all the unique aspects of Singapore. I also ate Kangaroo. Win.

Hong Kong, Bangkok, Borobudur, and other places were visit by others and me or are options for future students. I recommend that future students create a spreadsheet like we did to coordinate activities and do so before coming to Singapore so they can optimize (classic MIT) their experience in this intoxicating (pun not intended) region of the world.

Conclusions

Doing MISTI-Singapore this summer was world's better than sitting around waiting for grad school to start. I was able to work with many bright young students at SUTD through the 5th Row. The leadership program needs several changes to help it reach its full potential, but once it does, future MIT and SUTD students will have even more of a blast. There should be more formal training of the MIT students and better coordination beforehand so groups of students can formulate a more solid plan. On the ground, there should be several week-long collaboration projects between SUTD and MIT students. These could be as simple as organizing one-time events to actually putting together a club funding application, advertising and activities. This would allow SUTD students to get first-hand experience with our styles of leadership and teamwork. In the spirit of MIT, actually doing will yield more results than just telling them what we do.

Working at TLL was great from a scientific and general knowledge point-of-view, but the atmosphere was not nearly as welcoming as a whole compared to Janelia Farm, Centre de RegulaciÃ

GenÁšmica or other places I've worked. Ian's lab is small and that really helps with training. The project did not go as planned as we were unable to encapsulate Pomalidomide at the efficiency desired, but we learned a lot about Pomalidomide's chemistry, some interesting properties of copolymers and cyclodextrins, and other scientific data that should prove useful. Mouse trials showed increased lifespan of mice treated with *C. novyi* and Pomalidomide over controls, but the initial tumor size variation, different treatment start times and euthanization contribute to a preliminary study that guides rather than provides firm conclusions.

Singapore's food and culture turned out to be as rich as the country itself and as deep as Lee Kuan Yew's books. From the always reliable nasi goren, marinated pork with kimchi and chicken rice to the hidden treasures near Toa Payoh, Singapore never disappointed. I encourage future students to spend time not only soaking in the touristic beauty of the Marina Bay Sands and surrounding area, but also to explore the outskirts near the Kranji or hop over to Malaysia or Indonesia. The same should be said of the food, which ranges from McDonald's to fish eyes. Lastly, make friends with the locals and ask them a lot of questions, you'll find that what at first seemed to be set in stone is actually quite fluid.

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