

# iGEM 2017

## – A BITTERSWEET PROJECT



“Dude I’m currently looking for people to join iGEM with. You interested?” This message from my friend, an interest in the field, and the naive thought of getting some research experience were all it took for me to join iGEM in my second year.

While the iGEM experience had been enlightening throughout (from liaising with both internal and external bodies, to logistics planning, to explaining scientific concept in layman terms), designing our 3D DNA nanostructure and testing it over the Summer was, without a doubt, the most memorable part of the iGEM experience.

Designing the nanostructure seemed simple enough when it first began: decide on the mechanism of action, come up with a design, then generate DNA sequences for it. However, the reality was rarely so kind. You might think that generating the DNA sequences for the structure was easy, when this task alone actually took me one week. This was because we had to draw our structures (not with a drawing pad, but with mouse controls) on a special software, manually modify specific nucleotides into turning points or target-complementary sites, and after generating the sequences, check whether there are non-permitted

restriction sites. If yes, we had to regenerate the sequences all over again. It was not uncommon to hear us groaning in frustration as we were drawing our structures, and to hear us shamelessly exclaiming ‘look how fancy it is!’ when we managed to succeed.

As for our Summer lab work, I came across this quote that cannot describe our experience any more accurately: ‘Theory is when you know everything but nothing works. Practice is when



everything works but no one knows why. In our lab, theory and practice are combined: nothing works and no one knows why.’ One particularly horrific moment was when we entered the lab one Monday morning, only to discover that the -80°C fridge (where we stored our stock DNA oligos and

certain reagents) malfunctioned over the weekend, causing everything to melt and refreeze. The chemicals, fortunately, had been sealed properly so the contents were intact, but to this day, the cause of the incident remained a mystery.

Although the experiments seemed easy and straightforward enough, we were constantly bombarded by a series of failures:



errors in the protocol, mistakes when following the protocol, Faulty lab equipment, limited choice of reagents and equipment, etc. There were times

when we managed to solve one problem, only to discover another one. Naturally, we ended up spending a majority of our time combing through protocols, troubleshooting, and redoing the experiments. Needless to say, it was very frustrating sometimes, and we would argue among ourselves over what modifications to make and why, but the joy and relief when we found the right solutions and obtained positive experimental results was beyond rewarding.

iGEM is the place where you are truly and wholly responsible for your own project, I have learnt so much more in iGEM than I ever could have in any course, and I highly recommend iGEM to those interested in postgraduate research.”



### ABOUT HKU iGEM TEAM:

iGEM, or International Genetically Engineered Machine Competition, is an international team competition where students interested in synthetic biology build and test biological systems. Under the guidance of Dr Julian Tanner, Dr Alan Wong, and Mr Simon Shiu, a team of a dozen Science, Engineering, and Biomedical Sciences undergraduates aimed to design a self-assembling 3D DNA nanostructure that can function as an early diagnostic device. By changing the target-complementary detection sequence, the DNA nanostructure allows for a low-cost but rapid diagnostic device for a wide range of diseases. On top of building the DNA nanostructure, HKU iGEM Team 2017 also organised workshops for secondary school students, participated in the 50<sup>th</sup> Joint School Science Exhibition (JSSE), and organized the 1<sup>st</sup> ever iGEM Gathering to feature all HK iGEM Teams, and Shenzhen Institute of Technology (SSTI-SZGD) iGEM Team, as well as biohack space DIYBIO HK.

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International Genetically Engineered Machine  
(iGEM) Competition 2017 Team – Bronze medal