REVOLUTIONARY RESEARCH METHODS

A day in the life of Dr. Samuel Gan is frenetic, with his work beginning even before he steps into the office. During his commute, he is checking emails, writing papers, and pulling up lab results — a feat that he achieves on his smartphone alone, on apps he himself designed.

A LAB WITHOUT BOUNDARIES

The Assistant Principal Investigator at the Bioinformatics Institute (BII) says that the idea behind the scientific research apps stemmed from inconvenience, and frustration. A colleague had once requested DNA sequencing results while Samuel was on the go, and even with the files sitting in his inbox, he could not open them without getting to a computer. “I felt that it was relatively odd that we each carried a powerful computer in our pockets, but we were constrained by artificial barriers like office space, or the availability of a computer,” he says.

Unable to find a suitable alternative on the market, Samuel set out to create the app himself. The first app, *DNAApp*, was developed in just three months; the app allows researchers to analyse sequenced DNA samples on the go.

Since then, Samuel and his team have gone on to create close to 20 apps, some of which have garnered media coverage, and publications in top journals. Approximately 10,000 users around the globe have used these apps for their own research purposes.

Samuel hopes that in time, discoveries will not be limited to the lab. “One of my dreams is to have a truly mobile lab,” the self-confessed workaholic reveals. Conjuring up images of vans that contain a lab within, he hopes to shrink things down even further. “In the future, a lab may just be a small bag containing a mobile phone, and a few peripheral devices,” he says.

Seeing room for potential, the molecular cell biologist recently co-founded a specialised journal titled *Scientific Phone Apps and Mobile Devices*, the first of its kind in the world. Already, he has received submissions from various countries all over the world, some detailing interesting state-of-the art applications for apps.

Samuel’s apps have also garnered interest from various parties, further developed through tie-ups with companies, and eventually serving as important learning tools for the next generation of scientists, or anyone who has a budding interest in science. This is why he offers his apps for free online, as he believes in “restoring the freedom of knowledge and science.”

JACK-OF-ALL-TRADES

Besides his work in scientific research apps, Samuel’s work spans a wide range of disciplines. While his lab focuses on antibody engineering, and unravelling the mysteries behind antibody structures, Samuel is also involved in fields like drug design, and even psychology. “All the disciplines are connected, and it is all knowledge,” he says of dabbling in many different fields. Samuel believes the old adage, “Never put all your eggs in one basket” holds water even in science: “Being extremely specialised in academia is a relatively modern phenomenon. It may be difficult to get people to switch from their very specific fields, but it is important to adapt.”

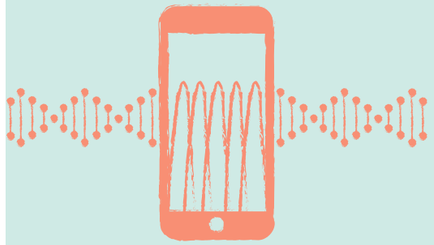
It is through Samuel’s involvement in many different fields that he can draw inspiration from unlikely places, pulling thoughts from one discipline to another. “It’s all about looking at things from a different angle,” he says.

THE CYCLE OF RESPONSIBILITY

Samuel’s interest in science began when he was young, where the science of shows like *X-Files* and *Jurassic Park*, although improbable, fascinated him. “Whatever I learnt in school during the day, I was watching it in a fictional form on TV at night,” he recalls. This interest was fostered by a slew of mentors he had during the early years of his scientific journey, including during his polytechnic internship at NUS-IMCB, where Samuel co-authored his first scientific publication.

In the same way he was given opportunities, Samuel hopes to give back to the scientists of tomorrow. Under Samuel’s guidance, many of the interns and new staff in his lab have made strides of their own and garnered first-author publications.

On a larger scale, Samuel observes that the advancement of science is dependent on public perception, where grants are more forthcoming when the outcomes of research are seen to have understandable, and significant real-world impact. In turn, such grants can be used to train scientists, who will then apply their expertise to improving the world. He sees it as a responsibility of science to perpetuate this cycle of nurturing talent. “We have a social responsibility to distribute beneficial research out to the world,” Samuel says.



MAKE, AND TAKE OPPORTUNITIES

Even for all his experimentation, Samuel is surprisingly pragmatic. Despite his oft-audacious approach to science, he still holds a philosophy rooted in logic — that of having a tangible goal in whatever he does. Besides having a clear destination in the horizon, Samuel also thinks life is about making use of the opportunities that come by. “If there are no opportunities, find ways to make them,” he says.

“Opportunity knocks and lingers for a very short while; grab it while you can. If there are no opportunities, find ways to make them.”

So in-between co-authoring books, taking courses to broaden his knowledge, and basically having a hand in everything, Samuel makes time in his busy schedule to do what he believes in most—creating new opportunities for himself and others.

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