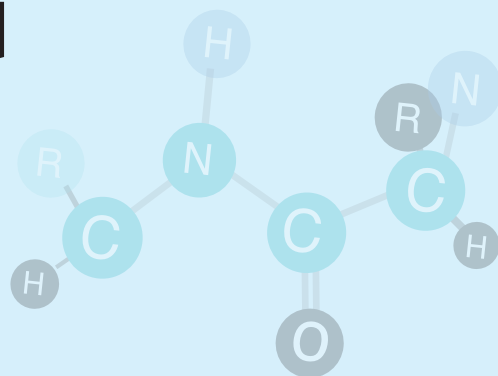


DECODING GENES FOR TRUTH



The truth is always beautiful," states geneticist Dr. Khor Chia Chuen. "Amazingly so."

Getting to the very bottom of things and turning up scientific truth is what drives Chia Chuen to research. "I qualify as a medical doctor," he explains. "One of the most striking observations made by medical practitioners is that some otherwise healthy people fall severely ill and fare badly as opposed to others who recover without lasting sequelae. What are the differences between them, and are they heritable? That is what motivates me; to know the truth behind causal relationships underlying biological elements and the reason we fall ill."

With his team, Chia Chuen analyses the genes of patient groups to look for clear differences in gene

marker frequencies. If big differences are found, the team compares them to other independent patient groups, whether local or overseas, to see if the same patterns can be found. If the differences are real and reproducible, it is a home run.

"Such hits occur very rarely. One such shocking moment was when we completed the genome scan on typhoid sepsis back in 2013," recalls Chia Chuen. "It was a small scan, so we weren't expecting anything out of the ordinary. Instead, we saw an extraordinary signal of association. People who have the variant HLA gene enjoy up to five-fold increased resistance against getting typhoid. Five-fold protection!" This breakthrough, behind which was an international team of scientists, was published in Nature Genetics in December last year with Chia Chuen as co-lead author.

"We only live once. Let's do our very best, to do the best science which can one day impact human health positively."



Dr. Khor Chia Chuen
Senior Research Scientist & Principal Investigator,
Genome Institute of Singapore

DOING ROBUST SCIENCE

On most days, the geneticist arrives in office before daybreak. There, he catches up with correspondences from collaborators and fellow researchers around the world, engages local collaborative partners and participates in research group discussions.

"The scientific culture at A*STAR is invigorating," he reflects. "We try to do the best science possible, in equal partnership with our local and international collaborators." This environment, where research can flourish, is a result of multiple factors, including a strong network of A*STAR research institutes and the availability of competitive grants.

As international collaboration among scientists, clinicians and pharmacists becomes increasingly a norm, important breakthroughs are further made possible. The discovery of the variant HLA gene's role in typhoid resistance is an excellent case in point. Researchers and clinicians from Singapore, Australia, the Netherlands, USA and Vietnam brought different insights and sets of data together, and the results could now pave the way for a more effective typhoid vaccine.

Says Chiea Chuen, "There is very strong core-funding which allows researchers and their clinical partners to perform large-scale genetic studies. Large numbers allow robustness and believability of data. I have shown that it is possible to do very robust genetic studies in Singapore, and that our efforts could best be complemented with overseas efforts to achieve results of exceptional impact. If we combine our efforts with these of our partners, we can make outstanding observations which individual sites and countries will not be able to do."

PLANTING TREES

Quiet introspection is a source of insight for Chiea Chuen. In his spare hours, he takes long evening walks in the nature reserves of Bukit Batok and Bukit Timah. "There, reflections and inspiration occur," he shares.

As with his quest for excavating truths behind illnesses, Chiea Chuen was inspired to embark on a journey of research during his training as a medical doctor. He reveals, "During this time, I realised that the fruit of current best medical practices we currently enjoy were made possible by researchers who preceded us 50 years ago. To pay this forward and to ensure that we keep pushing back the tide on chronic diseases, we must continue our efforts. These efforts could mean better care in the future."

Like him, many doctors around the world are realising that genes play a crucial role in human health and disease. The increasing awareness has prompted many doctors to enrol their consenting patients for genetic research. With the data available, genetic hits from research carried out by scientists such as Chiea Chuen could inform and change the medicines of tomorrow.

"I hope to show that good genetic studies can give us very profound and strong insights into how human diseases take hold within us. With that, the knowledge will allow us to design better medicines for the future," Chiea Chuen shares. "Knowledge is power, and power enables. It may not be our generation who will reap the benefits of all these efforts. It may be the next generation. But we must plant the trees today for those who will follow us."

