

Whither Clinicians in the Life Sciences?

By Dr Michael Chee

When Han Chong, the Editor of *SMA News* asked me to contribute a piece that could provide an insider's look at how clinicians in Singapore can contribute to the life science thrust that will be a major growth engine for the Singaporean economy, I was initially enthusiastic but later wondered about how to craft the piece to make a difference at a time when younger readers are torn between taking the safe path and venturing out into the road less travelled, one that could pay off big to those who succeed.

Can local clinicians contribute meaningfully to the "life science revolution"? Most definitely. Can clinicians be good scientists? Yes (and for that matter, they can be good at other things as well). Do they want to? Should they? I cannot answer the last two questions, but I will take a shot at answering the first two.

I will make metaphorical allusions to professional sports in the following material, because this is an enterprise that is a synergistic collaboration between a supportive spectatorship and a professional cadre that seeks to make a living by being the best at what they enjoy doing well. Successful professional sports establishments are self-sustaining and seem to have a bright future, similarities we wish to infuse into our life science thrust.



CONTRIBUTING FROM THE STANDS

At his peak, some estimate that Michael Jordan of the Chicago Bulls to have contributed US\$10 billion to the US economy¹. He was helped by those of us who do not even play basketball but who like to see spectacular action.

Most clinicians reading this piece have their sights set firmly on staying in the clinical track. Full-time clinicians have a valuable role in the life science industry by taking time to first inform themselves, and then the people they come into contact with, of the merits of scientific investigation. Lay members of the public are understandably wary about participating in clinical trials, or volunteering for human subject studies that observe the interaction between lifestyle (or behaviour) and health outcome. As we mature as a society, and as the population better appreciates the value of adding life to years and not just years to life, we stand to gain a tremendous advantage personally as well as collectively by understanding what behaviours, diets, environmental exposure affect our well-being, as well as our response to therapeutic manipulations of various kinds. Participating



in well-designed and ethical investigations will benefit all of us.

The greatest gain to be accrued from knowledge is how to reduce the probability of disease as distinct from dealing with illness in a post-hoc fashion. Singapore is well-positioned to better what Iceland has achieved, in terms of contributing to our knowledge on gene-environment-outcome effects. There, the 600,000 strong population is providing valuable insights through their participation in DECODE2, a textbook case of public-private collaboration. We would do well to defuse the notion that Singapore's future is contingent upon anyone but oneself being a human guinea pig for faceless corporations with only investor equity in mind.

Not too long ago, we discovered that there is around US\$300 billion in private wealth in Singapore³. Even if a small portion of this staggering sum could be allocated to support life science research through building up a culture of targeted philanthropy, the benefits to researchers and society would be considerable. While well-funded on a project level, one of the major concerns of life science researchers in Singapore is that on a longer time scale, there simply is not too much career stability. We witnessed how the Institute of Molecular Agrobiolgy⁴ was touted as a credible scientific centre, only to see it being dismantled and then reconstituted⁵. Lamenting after the fact will do little to restore the loss of confidence amongst scientists, when sharp tacks in public research direction occur for reasons known to only a privileged few. Doctors, by virtue of their privileged position in society, can go a long way towards raising funds to support life science research in a way that provides funding diversity critical to improving career stability for the key players. The Duke University School of Medicine raised US\$1 billion in just two



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years of campaigning (the total raised by Duke from 1996 to 2004 was a staggering US\$2.36 billion⁶), and while this figure might cause a few popping eyeballs, it serves notice of what can be done when there is will to make things happen.



PLAYING TO WIN

Nobody would embark on a career in professional sports without first assessing one's potential and then counting the cost. Sure, you can make US\$10 million a year in prize money alone⁷, like Vijay Singh as a top golf pro, but we do not see too many mothers egging their sons or daughters to turn pro in sport (I meant to say "scientist" but you know what I am trying to get at), compared to the legions of parents who would dearly love for their progeny to graduate as medical doctors.

Can doctors make good scientists? Doctors for the most part, represent the cream of their academic cohort, and by this token have better than average intellectual capacity. Surviving medical school and postgraduate training is no mean feat. To do so speaks of a certain capacity to retain and process information, a fundamental quality required of any competitive scientist. The second advantage clinicians have is their awareness of the parts of the body, a reasonably good mental model of how physiological systems operate, and how emotions and behaviour interact with endowed constitution to result in wellness or illness. This is an oft cited, but rarely realised advantage a clinician has in the life sciences, where the benefactor is not some network of signalling pathways, but a human being. For example, selecting the appropriate difference in gene expression to probe when one has access to data from a DNA array is informed by biologically and medically plausible hypotheses, at least on the first cut. A third potential advantage clinicians have in science is that they are used to the long hours necessary to make headway in science. Forget about the winsome smile of the muse with a tattoo on her shoulder, smiling at you in the A*STAR ad, tempting youngsters into a career in the life sciences⁸. Real results come from the willingness to run the gauntlet and to put in really long hours, often in solitary effort at the junior level to make a breakthrough that will secure funding or position. Clinicians have battle-tested capacity to endure the hardship of competitive science.

In recent years, the success of a few who have chosen a research track after spending significant amounts in time in the clinical arena has signalled the viability of clinician-scientists in Singapore. In response to calls to stabilise the career track for clinician-scientists, A*STAR has provided a training award⁹, as well as a pair of awards for established clinician-investigators¹⁰.

So, if there is so much going for physicians, why is it so few have invested in a career in science?

WINNING IS A TEAM GAME

Michael Schumacher¹¹ is a sight to behold as he burns rubber on the race-track, but just watch what happens during a pit stop at changeovers. We need stars, but we also need to build the support teams to nurture the stars. This is where the going gets tough. Apart from the need for administrative support that is thin at present, one needs stimulating co-workers who can see beyond direct self-interest and who are big-hearted enough to enjoy the successes of their colleagues without feeling threatened. We have to quickly educate those in power, or at least infiltrate their ranks so that support for life science research and its myriad processes and people do not fall by the wayside the next time the winds of fancy blow. For a country that has much, we can be absurdly stingy on supporting travel for research assistants and graduate students. More must be done to open the eyes of future generations of researchers who in my estimation have little clarity about what 24/7 science is, how hungry you have to be to make a meaningful contribution, but also how much of a rush playing in a big field can be. Gasp. Did I go overboard here? Sadly, no, and this partly answers the question posed in the last section. But for sure, things are improving and will get better as good results continue to emerge.



PERFORMANCE MATTERS

We all love winners, but in science, what constitutes a win is not as clear as getting a ball into a hoop. I am reminded of the fact that it took nuclear magnetic resonance at least four decades to transform from initial observation of physical phenomena to diagnostic tool¹², multiple Nobel Prize winners notwithstanding. So, there is a fine balance between short-term gains and long-term blockbusters. At present, while it is generally recognised that out-of-box thinking is what yields the greatest gains, I have seen with my own eyes how action freezes when it comes to putting the hand on the money till. This said, success begets success and we need winners. But before we hear the *ka-ching* of success more frequently, we need more dedicated players, the teams that support them, spectators to cheer and to raise capital to fund the enterprise. Yeah, Team Singapore, *boleh lah!* ■

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