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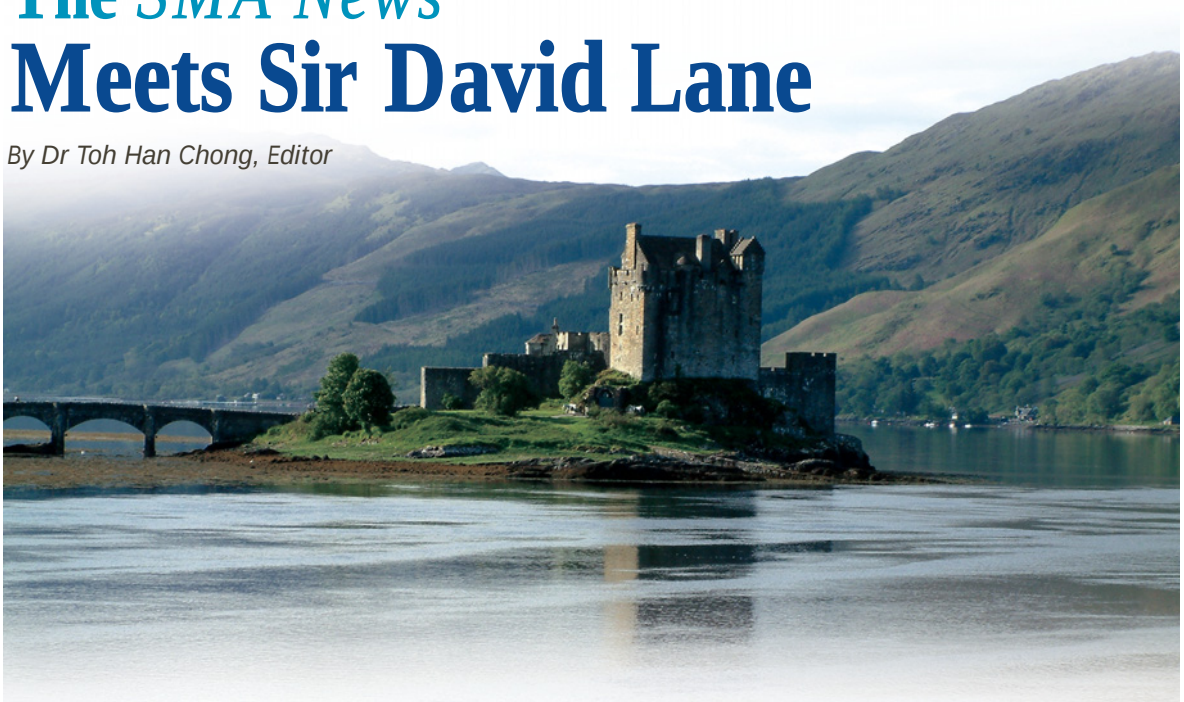
SMA NEWS

# The *SMA News* Meets Sir David Lane

*By Dr Toh Han Chong, Editor*



Sir David Lane, FRS, hails from Dundee, Scotland, a city which gave the world the first aspirin pill, beta-blocker drug, chest radiograph, postage stamp and fish and chips, and is also a vibrant biotechnology hub in the United Kingdom. Knighted by the Queen in January 2000 for his contribution to cancer research, Sir David is most famously known for being one of the discoverers of the tumour suppressor gene p53. He is the second most highly cited medical scientist in the UK in the last decade. He was appointed the new Executive Director of the Institute for Molecular and Cell Biology (IMCB) in Singapore in August 2004, although he will not move to Singapore full-time till January. The *SMA News* had the privilege of meeting up with Sir David recently.

**Sir David, how did your interest in science begin?**

I was 10 years old when I bought a microscope made of plastic for the equivalent of S$2, and looked at some pond water. I was fascinated to see all the teeming life forms that one could not normally see with the naked eye. That microscope was a terrible instrument compared to what is available today, but it opened up a fascinating world for me and was the beginning of my love for science. When my father died of colorectal cancer in my first year of university, I saw incurable illness first-hand in a very personal way. I was studying biology at the University College, London, then, and became dedicated to the idea of developing better treatments for disease.

**The p53 gene has been hailed the guardian of the genome and named molecule of the year in 1993 by *Science* magazine. It has been a pivotal contribution to understanding cancer. Can you tell us how it all began?**

I was actually working on my PhD in immunology, an unrelated field. I was performing many immunological and protein chemistry techniques at the time. We were analysing a cancer-causing virus protein when I noticed a consistent but unknown band on the protein gel photograph. Some of my colleagues thought it might have been a smudge, an artifact. However, it kept turning up on the protein gel and we pursued the matter further. I wondered if this unknown protein could in some ways behave like it was co-attached and coprecipitated with the known viral protein, the way that ß2 microglobulin is co-associated with the important immune protein, the major histocompatibilty antigen Class 1. We showed that this new protein indeed bound tightly to the host cancer-causing viral protein and we were fortunate to be able to publish our results in *Nature* in 1979. It does illustrate how training in one area of science can shed light in a totally different area. I always

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*Tel: 6223-1264*
*Fax: 6224-7827*
*Email: news@sma.org.sg*
*URL: http://www.sma.org.sg*

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think the best work occurs when you move from one area to another, or one place to another, so let us hope that is true with my move to Singapore!

**I am not a scientist but I recall that paper because it was eventually reported by the media to be a very important discovery, and because your paper by Lane and Crawford reminded me of a then shopping mall on Orchard Road called Lane Crawford.**

Hah hah, that is interesting. Yes, those were exciting times in science. Many of the scientists who were then working in molecular biology research have since made important discoveries in oncology. It was very heartening to have met many of these friends and scientists again recently at a conference in Singapore.

**And what are your first impressions of Singapore?**

It is nice and warm in Singapore! Singapore is a different society to what I am used to. I am impressed by the focus and commitment of the government. I notice that many ministers and political leaders here have degrees in business and engineering. In the United Kingdom, many political leaders have degrees in politics. I am fascinated by the idea that a lot of things can potentially happen very fast in a city-state and by the very concept of a city-state itself. But I am also very aware of the challenges in relation to scale, expectations and being in a different culture.

**Do you miss Scotland?**

At the moment, I am in transition, but I miss the cool autumns and riding my motorbike down the deserted roads. I am fond of old motorbikes and I have collected a few.

**There have been many discussions about the need for clinician-scientists in Singapore – can they be good in both clinical work and science? Why not let the real scientists do the science?**

It is very essential to encourage and nurture clinician-scientists. Science must be linked to clinical problems – to see how science can help medicine. There are questions that a clinician would come to me with which are very important, questions which they, and not I, would have thought of because of their training and perspectives as doctors. There is a need to drive this. There is a need to train clinicians to possibly PhD level and still be clinically competent. A different track has to be worked out for them so they do not have to face the extra pressures of too much patient care, demands and service, and worry about their research all at the same time. In the current system, we have clinicians who are good but only do research on the side. Clinician-scientists are an incredibly important group of people and should be trained as a distinct cohort and this may have to start from medical school. An environment needs to be created to be conducive to such individuals.

*Professor Sir David Lane*

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All these can be done. Singapore is wealthy, small and can respond to changes fast. Only a small group is needed to start.

**There is much talk also about downstream translational research, spin-offs, commercialisation and academic centres as engines of entrepeneurship. Does that mean that basic research has become less relevant?**

Excellent basic research is essential, and basic science should not be avoided, but rather, fruitless science. It is important to ask the fundamentally important questions and to try to solve them. While it is good to have good publications, we should not judge our scientists solely on publications. If we do outstandingly good science, the publications will come. It is the shedding of light at the fundamental level that makes applied science possible. An example of this is the Medical Research Council Research Laboratories at Cambridge University, where the fundamental discoveries of DNA, RNA, transcription, translation, protein sequencing, protein crystallography, monoclonal antibodies, cell cycle kinetics and cell death have led to huge commercial spin-offs and industries based on subsequent applied science. Dr Sydney Brenner has preserved an independent investigator-driven research culture at the IMCB which is a good thing and something I look forward to building on.

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**There can be a potentially uneasy relationship between academia and industry, just as there has been between clinical medicine and big pharmaceuticals. How does a scientific leader ensure that there are no potential conflicts of interest and that scientists do not get unduly tempted, leading to research bias or worse?**

Creating wealth is not wrong. It is important to society. It goes towards the national wealth, and can be pumped back. I realise there is excessive concern about this. But I also believe in ethics and trust. Entrepreneurship is good and should not be inhibited. Researchers and academics must declare any conflicts of interest if they have personal associations with private industry. We must have policing and policies that maintain standards and ethical guidelines, so that the good work can still be done with integrity. It is a fine balance. However, this issue should not stifle innovation. Many scientists start at technology companies not because they want money per se, but that they want to see their ideas being brought to fruition. We must initially trust people as a first step to make them trustworthy. Capitalism and philanthropy go together, and wealth imbalance cannot be avoided. Wealth can be distributed and risk should be rewarded. The Scandinavian countries like Finland are good models where the citizens are fundamentally taken care of, yet innovation and capitalism have generated wealth for the country. There are other capitalist societies where the disparity between the rich and poor are enormous, and the poor are left to fend for themselves and sometimes this is not possible.

**And certainly, Adam Smith, the father of Capitalism, was a Scotsman. Sir David, what do you do outside of science?**

I play tennis, enjoy long walks, riding on my motorcycle and reading. I am currently reading a book about how the measles, mumps and rubella vaccine was purportedly linked to increased childhood autism in one study, but that scientifically, there was no strong evidence for this link subsequently. Scientists have an enormous responsibility to educate the public. In the US, where the press can be irresponsible, you have the situation where 43% of Americans believe in alien abduction.

**Your favorite food in Singapore?**

I have had all types of food in Singapore, and I particularly like the seafood.

**In your journey in science, who has made the most profound impression on you?**

That would be my PhD supervisor and mentor, Professor Avrion Mitchison, of University College, London. Mitchison gave me and all his students the flexibility and space to do our own thing, but he was always there for us. He was enthusiastic about science and he created a very open environment. He could be very critical but it was more a peer review. He had a big impact on me and inspired me deeply. He treated everyone with incredible evenness. Science demands openness and humility, and Avrion Mitchison led by example. I recall a lecture we all attended which was especially complex, and at the end of it, Mitchison said: "Well, I did not understand any of that, did you?" Mitchison was not afraid to demonstrate his lack of understanding of a subject matter, even though he belonged to one of the great generation of scientists. It was the golden age of immunology to which Avrion Mitchison belonged, including Sir Peter Medawar, MacFarlane Burnet, Ivan Roitt, RR Porter, George Snell, and others.

**What excites you about medical science in the next 5 to 10 years?**

One of the most exciting areas of progress in medical science is in the area of predictive medicine and individualised, tailored medicine. If we can understand the genetic reasons that some patients respond better to therapy compared to others, that would help us find better treatments for each individual patient. One example is the recent Boston studies which showed that certain mutations on a cancer cell receptor predicts for a response to a targetted therapy for cancer. If we can diagnose and predict diseases in a better way, for example, at a genetic level, we can also prevent illnesses better and lead healthier lives. Public education will also play an important role in reducing the burden of disease at a community level. The rate of heart disease has dropped in Finland largely due to effective public health education. Stem cell biology has great potential but it is still in its early days. There are challenges ahead including overcoming the immunological barriers for human therapy and finding the right cocktails to drive and direct stem cell differentiation.

**Thank you, Sir David, we very much appreciate your spending precious time with the *SMA News*.**

It is my pleasure. I think I am being ferried to another interview right now! ■