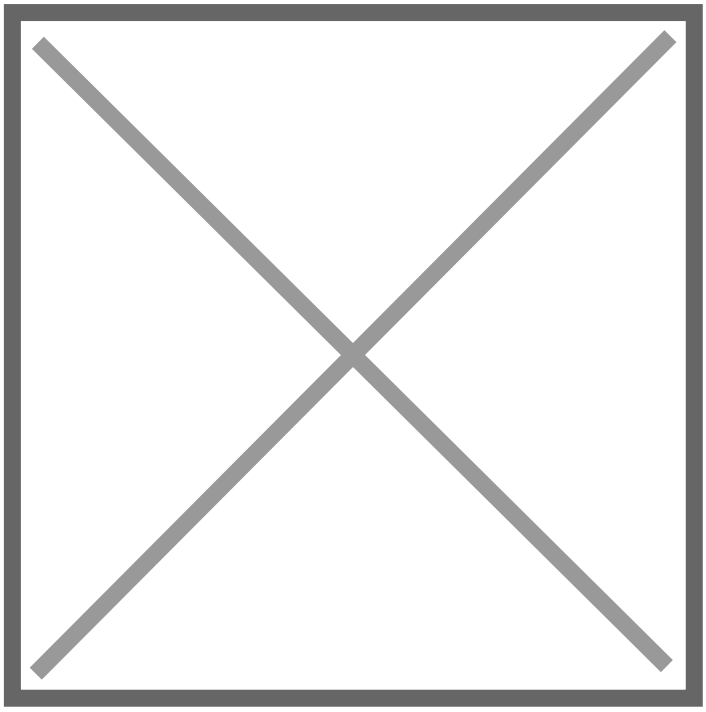
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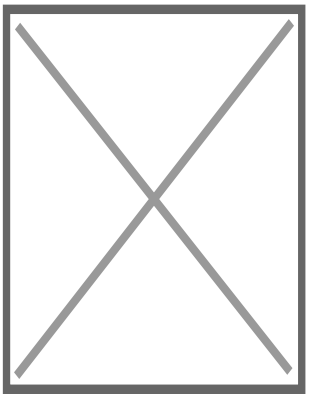
Ecology for success in the biomedical sector

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Ecology for success in the biomedical sector

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Executive director of the Genome Institute of Singapore, Dr Edison T Liu, is a physician-scientist who trained with Nobel Laureate,
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Dr Liu has authored over 220 papers, reviews and book chapters. He sits on a number of scientific boards for biotechnology and pharmaceutical entities and is also the executive director for the Singapore Cancer Syndicate - a funding agency, the Singapore Tissue Network - the national tissue repository, and is chairman of the Health Sciences Authority of Singapore, the country's FDA equivalent.



The recent spectacular growth in biomedicine in Asia, from biotechnology and drug manufacturing to medical tourism, is a consequence of powerful social and economic forces driving global development. Many countries are seeking a cut of the action by setting up bioscience parks. Consultants are called in to advise governments on how they can establish a biotechnology industry. Some of this advice, however, is from a narrow business point-of-view focused on physical infrastructure and investment capital. In reality the development of a biomedical sector requires a broader developmental framework than any other industry, one that is more rooted in the local societal fabric than others and one that requires a unique participation of governments and a favorable legal system.

Whereas a high tech chip manufacturing plant can be imported design and all, and the local workers trained in production, the establishment of a good hospital system requires excellent medical schools, advanced medical informatics, a blood banking

system that is reliable and safe, and skilled ancillary personnel such as nurses and medical technologists educated in established vocational schools. Certainly, there are examples of high quality hospitals catering to medical tourists as the Apollo group in India and Bumrungrat in Bangkok, but these are occurring in countries with established talent pools that have been previously exported to western countries. It is this returning talent pool that is driving the quality of the systems. In biotechnology, biomedical research, and pharmaceutical development, the availability of a talent pool that embraces quality control, a professional culture that is steeped in competitive biomedical research, and an ethically-based legal system that not only cares for intellectual property but issues such as patient rights are essential for sustainable development in these sectors. So, cheap land and cheap labor that can attract inward investment for car manufacturing will not be the primary drivers for the success of a biomedical industry. The local and national social ecology becomes a decisive factor.

Critics will point to the rise of advanced Indian pharmaceuticals and Thai medical services and the current plans to develop medical services in Dubai and UAE as exceptions. Indeed, these successes are spectacular but are primarily driven by simpler chemical processes (generics) or established to support a paying medical tourism market, which we believe, is a limited pool of patients. Both models are not sustainable in the long run without advancing into higher and more integrated forms.

So what is needed? Here is where governments must be a major player. School systems should be structured to support the needs of this industry, which includes not only the training of research PhDs and MDs but also nurses and technicians. This requires the development and continuous upgrading of research-enabled universities that are adequately funded to conduct competitive research. Moreover, this funding must be based on competitive quality of work and not as a right of seniority. When talent cannot be sourced internally, then they must be attracted from the outside. Indeed, this is true for the US where a third of all biomedically-oriented PhD workers are foreign born. In addition, much of the success of China and India can be attributed to the repatriation of nationals who have succeeded elsewhere. Unlike manufacturing, where managerial talent can be imported, the importation of medical personnel often must deal with the protectionist practices of local medical societies. Therefore, the intervention of governments to open the medical markets and to allow immigration of foreign workers is essential to launch a biomedical industry.

Finally, the most important factor is to root these developments to internal demand. Thus, biotech and pharmaceutical entities will need to show that their products benefit the local markets, and the advanced medical systems catering to foreign tourists must be made available to local citizens. A purely export mindset, which may work for textiles, will backfire in biomedicine because human lives and human dignity are at stake. This will ultimately require governments to spend more money in health care. The good thing, though, is that everyone will benefit from the virtuous cycles that follow.