

Regional Initiatives

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▼ Singapore trains its biotech workforce abroad

Jen Lin Liu¹

Jen Lin Liu is a freelance writer based in Shanghai, China.

To remain competitive, Singapore is sending its graduates to learn biomanufacturing skills in factories around the world.

A recent Singapore Economic Development Board (SEDB) review¹ shows that the country's biomedical sector manufacturing output grew by 15.9% in 2003 compared to the previous year. To face the demand for personnel in such a growing manufacturing sector, the city-state has created a scheme called the Training and Attachment Program (TAP). TAP is designed to train Singapore's recent university graduates in the field of biopharmaceuticals manufacturing. Should it be successful, the TAP scheme could help Singapore compete with other international biomanufacturing hot spots such as Ireland and Puerto Rico.

Singapore has pledged to spend \$4 billion in a 5-year period to support its burgeoning biotech industry; its biomanufacturing output now represents \$5.4 billion for 2003—7% of the island's total manufacturing—according to the SEDB review. And employment grew in 2003 by 3.4% in the biomedical science sector to reach 7,596 workers, according to the SEDB review.

To support its growth, the island has also launched an effort to bring in hundreds of researchers from abroad. But increasingly, the city-state realizes that it needs a two-pronged approach: while bringing talent in, it must create talent from within. "We realize that knowledge-intensive industries are built on human capital and being a small island, we have a finite number of people," says Janet Therrien, the head of marketing communications at the Singapore Economic Development Board.

Other small countries, which are actively supporting the growth of a biotechnology sector have adopted different strategies. For example, Ireland has set out to attract Irish expatriates working in the biotech and pharma industry abroad, especially in the US and the UK (*Bioentrepreneur* 31 July 2003, doi:10.1038/[bioent758](https://doi.org/10.1038/bioent758)).

The TAP program, which also recruits Singapore graduates in other related areas of manufacturing like engineering, science and information technology, trains participants at local Singaporean companies for 12 months. The government subsidizes the program by giving participants a stipend and allowance, while participating companies provide a salary. The Singapore Economic Development Board refused to elaborate on how much the program costs and how much participants receive, but one board representative said that trainees are "paid at market rate."

Some participants have also gone abroad for 18 months of training, with a quarter of the total trainees in the biopharmaceuticals manufacturing program going to the United States. Other trainees have gone to the UK, Belgium and Switzerland. Universities and government research institutes in Singapore also assist in the training.

John Rogers, the consulting services manager based in Shanghai for the biopharmaceutical arm of Bovis Land Lease (London), a construction and project management company, believes that the program should concentrate on giving recent graduates overseas experience. Drawing on his own experience of having trained recent graduates in Singapore's



AP Wide World Photos

Some of the newly qualified biomanufacturing graduates will work within the Biopolis research park, host of the Bioprocessing Technology Institute.

biotech industry, he says he found that "those who had gotten experience overseas were far more likely to grasp problems and come up with solutions" than those who were trained locally.

The biopharmaceutical manufacturing program aims to train participants in the areas of process development, validation, current good manufacturing practice production and quality assurance. So far, Singapore has been able to add a little more than 100 additional workers in the biopharmaceuticals manufacturing industry since the TAP scheme started in January 2003. The government expects to produce 1,000 PhDs in the biomedical sciences by 2010.

References

1. Singapore Economic Development Board 2003 Year in Review of Singapore's Biomedical Sciences Industry (SEDB, Singapore, 2003).

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