



Growing the fruits of HIV/Aids research

This study identifies the need for a centre to facilitate a strategic mission in HIV/Aids research and stimulate research output and product innovation in South Africa.

by Carl Montague and Hein Oosthuizen

In light of the South African government's intention to transform the country's economy from one that is largely resource-based to one that is more knowledge-based, the Department of Science and Technology (DST) has formulated a 10-year plan to accomplish this objective. In the health sphere, this vision includes the creation of five centres of competence to focus on South Africa's five top health priorities. The development of the local pharmaceutical industry was identified as a specific growth sector and to become a meaningful

participant in the global pharmaceutical industry by 2018. To this end, a sophisticated biotechnology industry was recognised as a key component, and four Biotechnology Innovation Centres (BICs) were consequently established to initiate such development.

Subsequent studies have shown that, although there are positive signs of growth in the intensity of research and development in the biotechnical industry, the commercialisation aspect is not yielding the desired results. The increased effort

in research is not translated into more products and revenues for the industry. One of the main reasons offered by these studies is the lack of a national focus in research. The typical symptoms of this situation are: poor communication and collaboration between various research organisations; too little involvement by industry in early research projects; and the under-funding of key projects. Moreover, the academic culture in many research institutions encourages scientists to focus more on publishing than on commercialising their research outcomes.

Thus, notwithstanding the initiative taken by the DST and the establishment of the BICs, progress has been limited. In particular, there has been no noticeable improvement in collaboration between scientists and industrial partners.

One of the established BICs, LIFElab in Durban, has been tasked by the DST to set into motion the original vision of a Centre of Competence (CoC), in this case, in the field of HIV/Aids research. The CoC was envisaged as a public-private partnership – in the form of an academic institution-industry research alliance – that could combine fundamental research with more applied research projects. Some other directives included the targeting of adequate levels of funding to areas of innovation

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and encouraging the sharing of knowledge and results through more synergistic collaboration. Collaboration between academic researchers and the biotechnical industry was to be a specific focus area. Ultimately, the centre would be required to play a facilitating role in increasing research that is both useful and ready for commercialisation.

With this purpose as background and in conjunction with LIFElab, a research project was undertaken at the University of Stellenbosch Business School (USB) to investigate the feasibility of such a centre and to design a strategy by which it could work towards its objectives.

The research framework

Although the envisaged centre would be run within public sector structures, the research was aligned with strategic thinking in the private sector. This practice has become more common in recent years as government bodies are undergoing a shift from mainly managing internal resources and efficiencies to an emphasis on delivery, external effectiveness and network development.

A strategic approach

The research was carried out by applying an analysis framework created from a combination of theoretical models pertaining to the field of strategic management. To address the central

research questions contained in the framework, a wide spectrum of primary as well as secondary data was needed. The data requirements focused on generating answers in respect of the following relevant areas:

- The proposed strategic intent of the organisation
- The nature of the external and internal environments and how these could affect the organisation
- Key success factors pertaining to the biotechnical industry
- Important gaps in the industry
- Projected strengths, weaknesses, opportunities and challenges of the envisaged centre
- Strategic issues relevant to the industry.

Primary data collection

Primary data were captured through in-depth semi-structured interviews with important stakeholders. The interviewees were all senior executives or other key experts from a variety of Aids-related organisations, such as the Centre for the AIDS Programme of Research in South Africa, the Medical Research Council and the South Africa AIDS Vaccine Initiative, and also from university research institutes and companies in the private sector. The interviews were recorded and transcribed at a later date, and transcriptions were sent to respondents for checking and approval.

Secondary data collection

The research also made extensive use of secondary data sources, including reports on other initiatives to promote innovation in the public sector and in private-public partnerships, data about the biotechnical industry in South Africa, published economic and financial data, unpublished industry communications from the DST, and other government and NGO briefs.

Prospects for the South African biotechnology industry

The information gathered generated a large and diverse set of detailed findings.

An important factor is that the South African

biotechnology industry is small compared to the global industry. The opportunity therefore exists to further penetrate the global market and accomplish substantial growth for the South African industry.

Opportunities and success factors

The study identified a number of driving forces that could impact positively on the industry in South Africa.

- Since many manufacturers globally have scaled down on research and development, the pipeline of new products is diminishing. Manufacturers of pharmaceutical products are competing against each other to secure the rights to new drugs developed by the biotechnical industry. This presents a key opportunity for South African biotechnical research to strengthen its foothold in the global market.
- The growing trend of globalisation in the business world opens many more doors for strategic alliances and collaboration with international partners.
- The increasing incidence of HIV infection places much pressure on the industry to deliver. This, ironically, presents another opportunity. Because South Africa has a large HIV patient pool for clinical trials, the cost of such trials is significantly lower than in many other countries. This can be used to advantage.

The study also found that the future of the industry could be significantly affected by a number of factors, and that a proper strategy is needed to address these. First of all, the regulatory environment in South Africa with regard to new medicine registration is slow and results in costly delays. Secondly, a lack of collaboration and strategic alliances requires attention. The ever-increasing cost and complexity of drug development necessitate the formation of alliances that can share risk and capital resources. Another important aspect is uncertainty with regard to funding and a lack of coordination of funding for HIV/Aids research.

Other factors identified as key to the success of the industry are the ready access to sufficient and sustained capital, attracting and retaining talented employees, and continued government support.

Strengths and challenges

The South African biotechnical industry was found to have some key areas of competence, but also areas with important deficiencies.

Areas of competence

On the positive side, the current levels of expertise in all aspects of conducting clinical trials related to HIV/Aids products were considered to be a particular competency. To a lesser extent, the scope of academic research in the HIV/Aids field was also identified as a competency. In addition, the large number of HIV/Aids patients and the ability to study the effect of preventative and therapeutic agents in many subgroups of affected patients could be leveraged as an important resource strength.

Areas where gaps exist

On the downside, the industry suffers from a shortage of skills and talent. Too many researchers also pursue foreign research agendas to the detriment of national ones. Furthermore, there is a meaningful gap in the industry as far as high-throughput compound screening facilities are concerned. Very few contract research laboratories in South Africa can screen a large number of compounds for anti-HIV activity in a short period of time. Academic laboratories are, as a rule, not suitable for this kind of fee-for-service testing. Other gaps identified were a shortage of pre-clinical development facilities, pre-clinical testing facilities and manufacturing plants capable of producing products for use in clinical trials.

Focus themes of the proposed CoC

The research identified a number of strategic issues faced by the proposed centre of competence. Based on the data gathered, the insights given by various stakeholders and the consequent derived findings, this study could recommend that the CoC be formed. It further confirmed that it should be developed along the lines of a public-private partnership, and outlined a comprehensive strategic framework for the proposed centre.

The strategy includes the establishment of CoC-operated laboratories in which collaborative research is to be performed by academic and industrial researchers, working side by side. The true benefits sought include increased transfer of skills, increased sharing of facilities, reduction in duplication of research, and increased research output and product innovation.

Moreover, a comprehensive analysis of strengths, weaknesses, opportunities and challenges (SWOC) was performed to ensure that the elements of the strategy capitalise on the strengths and opportunities and make adequate provision for addressing weaknesses and challenges.

A number of strategic themes were identified which formed the framework of the strategy. The strategic components can be summarised as follows:

Core focus

One of the foremost functions of the CoC should be to develop a national HIV/Aids research and development plan that is supported by the majority of the researchers in the field. This plan should ensure that funding is made available and directed to the highest priority projects, and specifically to research with the greatest potential for generation of HIV/Aids products.

Other core activities should focus on creating new technology platforms to fill the gaps in the value chain (for example, screening facilities and pre-clinical development laboratories as highlighted above) and to ensure that researchers develop products to meet the HIV/Aids needs of South Africa in particular.

The CoC should consider the involvement of foreign partners as long as their agenda and objectives remain firmly aligned with those of South Africa's national HIV/Aids research strategy.

Funding

Funding will be a key issue of the CoC. Taking into account success factors from CoC programmes in various developed and developing countries, it is necessary to ensure that the CoC obtains a stable commitment of funding from public sources for a period of longer than five years.

Although in similar programmes elsewhere the private sector partners are expected to contribute funds toward the operations of the centre, this was not seen as suitable for South Africa, given the infancy of the local biotechnology industry and its uncertain funding situation. A system similar to an Estonian CoC programme, which was examined as part of the research, might be more appropriate. The

private partners provide funds in kind, in the form of access to facilities and industry researchers' time, rather than cash.

Operations

The centre should not only be involved in building partnerships across the industry, but also seek and exploit synergies between partners so that the development of new products is stimulated. The functioning of the centre should be based on effective industry participation as well as the buy-in of all the participants. One of the spin-offs would be to reduce the costs of clinical trials. Researchers that receive funding from foreign sources should be integrated into the national research plan.

Skills and talent

As shown by an analysis of CoC programmes elsewhere, strong and skilled leadership in the CoC is a prerequisite. Individuals with appropriate experience and capabilities need to be identified and recruited to lead the CoC programme. As the shortage of skills in the industry was identified as a problem area, the CoC should be actively involved in strategies to promote the recruitment and retention of talent in the industry, and to establish programmes to build human capacity.

More specifically, the CoC should investigate the development of globally competitive incentive packages to attract skilled and talented foreigners to the CoC, as well as target expatriate South Africans in related industries with attractive offers to return.

The effective management of intellectual property is a particular skill that is largely lacking in the industry at present, and the CoC should also address this need.



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This research was conducted by Dr Carl Montague of LIFElab as an MBA study project, and was supervised by Prof Hein Oosthuizen. The research report, *Developing a strategy for a centre of competence for HIV research and development in South Africa*, was presented to the University of Stellenbosch Business School in December 2008.



Write to us: What other programmes of national interest will benefit from synergistic consolidation?

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