

In this edition...

A feature of the Australian biotech sector is its depth and diversity and this edition highlights that very clearly. The three stocks we cover are AGT Biosciences, Prima Biomed and Biotech Capital. AGT is a genomics based discovery and validation firm. Prima has a portfolio of companies linked by the common theme of immunotherapeutics. Biotech Capital is an investment company that has invested in a broad range of early stage biotech and biotech-related technology companies.

AGT has more than doubled in value in the space of a week, leaving investors wondering if the run is over. We answer that question inside as well as examining Biotech Capital's recent performance and comment on advances with Prima Biomed's DCtag technology.

The Editors

	Bioshares Portfolio
Year 1	21.2%
Year 2	-9.4%
Year 3 (to date)	73.3%
Cumulative Change	90%

Bioshares is published by Blake Industry & Market Analysis Pty Ltd. The company also provides market and company analysis of the Australian pharmaceutical and biotech industries for local and international funds management institutions, venture capital funds and other related industry groups. For further details contact David Blake (see details below).

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Individual Subscriptions (48 issues/year)
\$220 (Inc.GST)
Edition Number 37 (August 29 2003)
ISSN 1443-850X

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Bioshares

Number 37

Delivering independent investment research to investors on Australian biotech, pharma and healthcare companies.

Biotech Capital – Investment in Clinical Cell Culture Good for Share Price and Future Fund Growth

Biotech Capital's investment in Clinical Cell Culture (CCE) recently was made with fortuitous timing for a number of reasons. Not only did Biotech Capital (BTC: 52 cents) get into the stock at a bargain price, at 10.5 cents per share when the company was valued at \$8 million with \$4 million in cash, but the biotech fund now stands to raise up to \$20 million through the exercise of existing options on the back of the stock's strong run.

The BTC options (BTCO: 4 cents) assigned to investors who bought shares in the float three years ago have an exercise price of 50 cents. The options are due to expire next month. If the underlying shares were trading at a significant discount to the exercise price of the options, most of the options would have expired without being exercised. The company is seeking to have this raising underwritten which should nett the company just under \$20 million. With just under \$12 million in cash in the bank, BTC will be very well funded to continue its investment process.

Future funds for BTC will also be delivered from two other sources. Firstly from the sale of existing investments and secondly from the exercise of a new series of options that are about to be issued free to shareholders.

Exits from existing investments

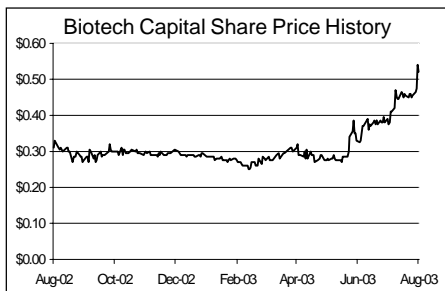
Over the next three years BTC will look to exit many of its investments. In *Bioshares'* opinion, the first opportunity may be in Alchemia which we believe looks likely to list before the end of this year. BTC invested only \$2 million into Alchemia so a successful listing will not greatly impact BTC's share price (the listing may be more pronounced in Medica's share price which has a much larger stake in the company).

We should see Proteome Systems list early next year. BTC's investment in this company is currently worth about \$10 million, twice the amount that it invested. PKS, which manufactures an enhanced x-ray imaging system, will likely be divested through a trade sale in our view rather than a listing. Xenome, which also has Medica Holdings as a major shareholder, may also list in the next 12 months once the IPO window is fully open. Stem Cell Sciences will probably make a UK listing in the next three years. And Biocomm Services, which is effectively an early stage VC group, may also list locally when conditions are favourable.

Continued over

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Biotech Capital financials

Market Cap.	\$42 m
Current value of cash & investments	\$53 m
Discount to fair value	21%
Cash (30/6/03)	\$11.9 m

New Option Issue

Shareholders on the BTC register at 13 October 2003 will receive one free option for every two shares they hold. The options will have an exercise price of 55 cents and an expiry date of October 2006. The options should be valued at about 10 cents each and it will be another incentive for shareholders to exercise their current options to receive the new options. However based on the assumption that the new options will trade at 10 cents each, if BTC’s share price falls below 45 cents then it may jeopardise the \$20 million raising from the exercise of the existing options. Given that BTC’s share price is largely driven by CCE’s share price at the moment, the managers at BTC will be hoping CCE’s good fortunes continue.

Discount to nett value of investments

BTC is currently valued at \$42 million. The value of its cash and investments is approximately \$53 million which indicates the company is trading at a 21% discount to fair value.

Investment in Stem Cell Sciences

In July this year BTC made another savvy investment, acquiring a 14.6% stake in Stem Cell Sciences (SCS). BTC had been eyeing off the investment for a considerable period and the wait seems to have been worthwhile. BTC invested \$3 million in the company at a pre-money valuation of \$12 million. As the name suggests SCS is commercialising its intellectual property and expertise in stem cells. Although the use of stem cells in a therapeutic application may be 6 - 10 years away from reality, SCS is generating a solid revenue stream from the production of cell lines for international pharmaceutical and biotech companies.

Over the last three to four years SCS has generated revenue of about \$12 million from its contract service work. SCS grows animal cells such as neurons from its stem cell lines. These cells are completely identical and are used by drug developers to screen novel pharmaceutical compounds in the laboratory for activity, which in the case of neurons, for compounds with the potential to treat any range of neurological disorders. There are very few contract service providers that work in the stem cell area and SCS sells its products to many of the largest pharmaceutical companies. The sales are sometimes on a straight fee-for-service basis although some contracts include future success fee payments.

Future Investments

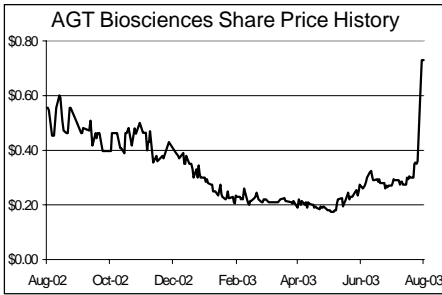
BTC currently has \$12 million in cash which it will use to make further investments in the biotech area. Its investment foray into listed biotech companies (through its investment in Clinical Cell Culture) has been exceptionally successful for the group however the company says future investments will likely be in unlisted companies. BTC is considering three investment opportunities at present, which would come close to completing the company’s investment process from the initial funds raised.

BTC continues to make well founded investment decisions. The poor investment climate in the last 12-18 months has enabled the company to make investments at some very low entry levels. It’s investments in Xenome, Biocomm Services, Stem Cell Sciences and Clinical Cell Culture would all fall into this category. On the downside, the company has taken three years to invest 75% of the \$40 million it raised in 2000. This, combined with the time it takes for its investments to create recognisable value, has largely been the reason the stock has predominantly traded below its issue price of 50 cents. However with both of these factors close to being addressed, there may be more upside with this stock over the next 12 months.

BTC remains a lower risk investment option within the biotech sector. Its diversified portfolio within a tax-free investment structure (as a pooled development fund) makes it an attractive long term investment opportunity.

Bioshares recommendation: **Speculative Buy Class A**

Why did AGT Biosciences Share Price Increase by 108%?



AGT Biosciences (AGT; \$0.73) recorded a staggering 108% gain over the past week. For many investors who did not enjoy the run, it may seem as though an opportunity evaporated before their eyes. Has the stock been overbought or is there still upside? *Bioshares* recommended AGT as a Speculative Buy Class A in edition 12 when the share price was 22.5 cents and the company was capped at \$13 million. It was also highlighted last week as one of the stocks with upside potential when it was trading at 35 cents.

Why the stock moved

AGT Biosciences is a discovery and disease validation company focused on finding genes and their expressed products (eg proteins) involved in obesity, diabetes and depression.

AGT Biosciences financials

Market Cap.	\$43 m
Cash (31/12/02)	\$6.2 m
Revenue (6 mths to 31/12/02)	\$2.1 m
Loss (6 mths to 31/12/02)	\$1.4 m

AGT's share price moved for several reasons. It is not unusual for a biotech company to make solid progress steadily and quietly in any twelve month period. With the market viewing biotechs positively at present, and with significant gains having been made in a good number of stocks, traders and value buyers will have been on the look out for bargain stocks, and AGT has been a stock that fits this category. AGT has been a stock that investors have played catch-up with very, very rapidly.

However, the market does not always respond to the more important announcements a company may issue. This was the case this week and last week with AGT Biosciences. In our view, AGT announcements of August 19 and also June 27 were more significant than the announcement of August 25, which is the announcement most closely related time-wise to the stock's sudden rise.

The August 25 announcement concerned further validation of a variant of the PARL gene's role in diabetes. The August 19 announcement concerned the expansion of patent protection covering the PARL gene (also known as AGT203) to include cancer and age-related degeneration. The announcement of June 27 concerned publication in the journal *Protein Science* which revealed that Abbott Laboratories had been working on a protein product of AGT's Beacon gene. These announcements are more significant because they add external validation to AGT's work and secondly show a broadening of opportunity in value creation that can be captured wholly by AGT.

Although AGT Biosciences has appreciated rapidly in value, it is our view that the stock has not exceeded a reasonable value range for a company working in gene discovery and validation. The company is capitalised at \$43 million. Although AGT Biosciences has a long term pay-off horizon for potential revenues from pharmaceutical product royalty streams, the company's fee-for-service work is well established and growing. It is a commercially focused gene discovery and validation engine and has a solid management team. For investors wanting to diversify their biotech portfolios with a genomics play, AGT represents *Bioshares* preferred stock for that selection.

Bioshares Recommendation: Speculative Buy Class A

For a brief summary of how companies can patent genes, see our article on Page 4.

How can you patent a gene?

The patenting of genes is a troublesome question for many first time biotech investors. At issue is an understanding of what patents are about and less so what genes are about.

A patent represents a right to exclude others from exploiting an invention for a set period. This is substantially different to, for example, the concept of ownership of real estate property which can exist without a time limit and pays no heed to invention.

In early 2001, the US Patent Office (USPTO) established guidelines to cover 'gene' patents, derived from standard patent criteria.

These criteria include utility, and non-obviousness i.e. the invention is not obvious to those familiar with the particular and special area of discovery and invention. Patents must describe an invention in sufficient detail that so that the scope matches the claims and that others can be shown how to make and use the invention (enablement). Enablement is a key plank to the patent system because that is what allows inventions to be ultimately shared with society.

According to the USPTO is not possible to patent a gene per se because its mere existence does not satisfy criteria of utility. In other words, a function of the gene must be described (but not necessarily only in terms of an expressed product such as protein). A consequence is that the more comprehensively a gene's function is described, then the stronger the patent or chance of acceptance becomes.

The human genome has somewhere between 32,000 and 35,000 genes. The USPTO has to date granted more than 1,600 patents over genes and fragments of genes called SNPs. There are more than 30,000 genes claimed or disclosed in patent applications submitted to the USPTO. Many gene patent applications are likely to be rejected because they fail to meet the utility test. Companies such as AGT Biosciences have much higher probabilities of being granted patents because of their higher standard of validation work.



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Prima Biomed – DCTag Technology Achieves Important Milestones

This week Prima Biomed (PRR; \$0.43) achieved several important milestones with its subsidiary company, Panvax.

The core technology being developed by Panvax is a vaccine adjuvant technology, DCTag. Vaccine adjuvants enhance or modify the immune system's response to the active components of a vaccine, usually an antigen (a particle that elicits an immune response). Vaccines prime or teach the immune system to recognise invading pathogens and establish a stronger and more rapid response to infection. There are many types of adjuvants for example liposomes and ISCOMs, one of which is being developed by CSL for its HPV vaccine.

Panvax's DCTag technology links a vaccine antigen to a carrier that is taken to key immune cells known as dendritic cells. The technology is attractive because it allows for one out of a choice of many antigen's to be coupled to the carrier, depending on the disease and treatment concept in question. The technology may be attractive in the first instance to vaccine manufacturers who currently experience a less than optimal performance with their existing adjuvant technology. It may also attract vaccine manufacturers' attention because results to date with DCTag show that its benefits are achieved with one but not more than two injections and it is a pharmaceutically stable product.

The milestones

Panvax has now successfully completed safety studies for DCTag with no side effects observed in organs or cells in tissues. It has also completed comparison studies with immune stimulants, adjuvants and vaccine protocols. DCTag was found to be superior to currently marketed adjuvants such as alum and those in development such as MPL and QuilA.

This has been important ground work for the company to conduct, since potential collaborators and licensing partners would as a starting point seek safety and toxicity data pertaining to the technology.

How it works

Prima has not established a complete and definitive understanding of how DCTag works although it appears to work very effectively. For example, DCTag has achieved very promising results in treating cancer in mice and has eradicated malaria in mice.

One theory for DCTag's effectiveness is its size. DCTag is a nanoparticle. It is smaller than a virus, but bigger than proteins and may be of such a size that it is treated ambivalently by the immune system.

Another reason Prima researchers have found DCTag to offer a great deal of immuno-therapeutic potential is that DCTag is taken up by the dendritic cells abundantly but also by a special subset of dendritic cells that are highly suited to interacting with and stimulating T-cells.

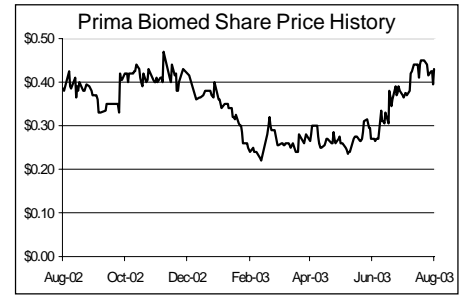
Next steps

Prima now intends to partner DCTag with a manufacturer of a marketed vaccine and commence a Phase I trial to demonstrate DCTag's potential in improving the efficacy of an existing vaccine. This is a sensible strategy for Prima as it is a low risk path towards achieving commercial validation for the technology. A likely scenario is that Prima collaborates with a large vaccine firm which gives Prima an exclusive licence to their vaccine antigens for a specific vaccine (such as Hepatitis B) and the partner gains access to clinical trial data.

Prima is also aiming to license out the technology for specific applications in the areas of malaria and oncology and continues an in-house cancer immuno-therapy program.

Summary

Prima Biomed has investments in three other companies: Oncomab, Arthron and Cancer Vac. Prima recently raised \$2.7 million and has plans to raise another \$4.2 million. These funds will be applied across all the companies in the Prima Biomed group, but will also enable the commencement of a Phase II trial for Cancer Vac's immunotherapy program.



Prima Biomed Financials

Total Cap.	\$35 m
Est. cash after current capital raising	\$8 m
Loss (6 mths to 31/12/02)	\$2.1 m

The announcement by Prima of progress with the DCTag technology is extremely pleasing news. The technology represents perhaps the greatest potential of all of Prima's projects, not least because it has an apparent broad application and offers simplicity for pharmaceutical scale-up and manufacture.

Bioshares Recommendation:
Speculative Buy Class B



Portfolio Changes

Two stocks have been removed from the portfolio due to strong recent gains. These are Axon Instruments (35 cents) and Clinical Cell Culture (44 cents).

How Bioshares Rates Stocks

For the purpose of valuation, *Bioshares* divides biotech stocks into two categories. The first group are stocks with existing positive cash flows or close to producing positive cash flows. The second group are stocks without near term positive cash flows, history of losses, or at early stages of commercialisation. In this second group, which are essentially speculative propositions, *Bioshares* grades them according to relative risk within that group, to better reflect the very large spread of risk within those stocks.

Group A

Stocks with existing positive cash flows or close to producing positive cash flows.

- Buy** CMP is 20% < Fair Value
- Accumulate** CMP is 10% < Fair Value
- Hold** Value = CMP
- Lighten** CMP is 10% > Fair Value
- Sell** CMP is 20% > Fair Value

(CMP–Current Market Price)

Group B

Stocks without near term positive cash flows, history of losses, or at early stages commercialisation.

Speculative Buy – Class A

These stocks will have more than one technology, product or investment in development, with perhaps those same technologies offering multiple opportunities. These features, coupled to the presence of alliances, partnerships and scientific advisory boards, indicate the stock is relative less risky than other biotech stocks.

Speculative Buy – Class B

These stocks may have more than one product or opportunity, and may even be close to market. However, they are likely to be lacking in several key areas. For example, their cash position is weak, or management or board may need strengthening.

Speculative Buy – Class C

These stocks generally have one product in development and lack many external validation features.

Speculative Hold – Class A or B or C

Sell

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48 issues per year for an individual subscription (electronic distribution): **\$220**

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