

**In this edition...**

Investors have been drawn of late to biotech both locally and in the US, but for different reasons. An Australian thematic is that a number of companies have initiated Phase III trials. In the US, an acquisition spree by larger pharma firms has seen the Nasdaq Biotech Index surge and is now likely to break the 1300 point mark and head to territory not seen since the year 2000. Biota has released positive results from its Phase II rhinovirus trial, where an opportunity may lie in treating asthma, cystic fibrosis and COPD sufferers. Alchemia is proposing to demerge and list Alchemia Oncology, leaving Alchemia as an annuity-style investment vehicle built on fondaparinux derived income.

**The Editors**

**Companies Covered: ACL, BTA, Bioxyme, Quarterly Review**

	Bioshares Portfolio
Year 1 (May '01 - May '02)	21.2%
Year 2 (May '02 - May '03)	-9.4%
Year 3 (May '03 - May '04)	70.6%
Year 4 (May '04 - May '05)	-16.3%
Year 5 (May '05 - May '06)	77.8%
Year 6 (May '06 - May '07)	17.4%
Year 7 (May '07 - May '08)	-36%
Year 8 (May '08 - May '09)	-7.4%
Year 9 (May '09 - May '10)	50.2%
Year 10 (May '10 - May '11)	45.4%
Year 11 now commenced	-19.4%
<b>Cumulative Gain</b>	<b>229%</b>
<b>Av. annual gain (10 yrs)</b>	<b>21.4%</b>

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# Bioshares

30 March 2012  
Edition 449

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

## Quarterly Review

### Investors Favour Biotech

Investment sentiment towards ASX listed predominantly development stage life science stocks rebounded in the March quarter 2012. The **Bioshares Index**, which measures the performance of this group of stocks increased by 9.2% for the quarter. The **Bioshares Large Cap Index** posted an 11.8% gain. However, the **Nasdaq Biotech Index** recorded a stunning 18.1% gain for the quarter following an 11.9% gain in the December quarter. In *Bioshares* 442 and *Bioshares* 443 we discussed the factors driving the growth of the Nasdaq Biotech Index, which included Gilead's acquisition of Pharmasset, Bristol Myers Squibb's acquisition of Inhibitex and Regeneron's gaining of FDA approval for its eye drug Eylea. BMS is currently pursuing Amylin, for a price tag of US\$3.5 billion and Roche has been attempting to acquire Illumina.

Clinical trial developments dominated moves in the Bioshares Index. Mesoblast, which is capitalised at \$2.2 billion, recorded a 14% gain for the quarter, aided by regulatory clearance for its forthcoming trial of its stem cell product in patients with Type 2 diabetes. Starpharma's stock rose by an impressive 51%, with news of that company's commencement of two Phase III trials of its Vivagel product as a treatment for bacterial vaginosis a contributing factor. Pharmaxis shares posted a solid 26% gain for the quarter, with the driver being its anticipated final approval in Europe as well as reimbursement acceptance by the Australian Pharmaceutical Benefits Scheme. Prima Biomed, initiated a Phase III trial in the March quarter and saw its stock rise 50% over the quarter. And shares in Alchemia, which also commenced a Phase III study of its HA-Irinotecan product, rose 70% over the March quarter.

Capital inflows dropped to very low levels in the March quarter, with a \$12.6 million in funds raised by development stage life science firms. This figure is not surprising given the \$232 million raised in the December quarter, as companies such as Phosphagenics, Alchemia, Starpharma and Pharmaxis replenished their cash resources with \$162 million in follow-on funding. Several companies, including Antisense Therapeutics, Allied Healthcare and Bioniche will complete various capital raising activities in the following quarter.

Also to be expected in the following quarter is the listing of Osprey Medical and the relisting as Bioxyme of the merged Hunter Immunology and Probiomics (see page 6). Virax Holdings is also merging with 4G Vaccines. While investor sentiment towards biotech is positive, the chances of seeing an opening of the IPO window will increase.

## Bioshares

### Index performances by Quarter

	Q1 2011	Q2 2011	Q3 2011	Q4 2011	Q1 2012
Bioshares Index	3.9%	-9.4%	-14.0%	-6.6%	9.2%
Nasdaq Biotech Index	7.3%	6.5%	-12.5%	11.9%	18.1%
Bioshares Large Cap Index	-3.1%	-7.2%	-11.3%	5.6%	11.8%
ASX 300 Index	1.9%	-5.0%	-13.1%	1.5%	6.7%

**Capital Raisings by Australian-listed Biotech Companies Q1 2012**

Company	Investment Manager or Investor	Type of raising	Funds raised (\$M)
Analytica		Rights Issue	\$2.80
Anitsense Therapeutics	Patersons Securities/Roth Capital Partners	Placement (Tranche 1)	\$2.70
Allied Healthcare Group	RBS Morgans	Placement	\$2.00
Consegna Group		Placement	\$1.50
Immuron	Paladin Labs	Draw down	\$1.05
Bluechiip		Placement	\$0.75
Bone Medical	La Jolla Cove Investors Inc	Convertible Note (part conversion)	\$0.59
Healthlinx	La Jolla Cove Investors Inc	Convertible Note (part conversion)	\$0.52
Bluechiip		Placement	\$0.47
Optiscan Imaging	Bergen Global Opportunity Fund	Convertible Securities (T1)	\$0.22
<b>Total raised in Q1 2012</b>			<b>\$12.6</b>

**Selected Clinical Trial Developments - Q1 2012**

Company	Code	Product/Therapeutic	Event
Alchemia	ACL	HA-Irinotecan (mCRC)	Commenced Phase III study; 390 pts
Allied Healthcare Group	AHZ	Gynecel (treated patch for pelvic floor repair)	Implanted patches for pelvic flood and hernia repair for 6 month duration study
Biota Holdings	BTA	BTA798 (human rhinovirus infection in asthmatics)	Completed Phase II study; 300 subjects enrolled; 93 confirmed HRV infected; 85 complied with study protocol; statistically significant reduction in cold symptoms
Circadian Technologies	CIR	VGX-100 (anti VEGF-C antibody)(Cancer)	Commenced Phase I study
Healthlinx	HTX	Ovplex (Ovarian cancer diagnostic)	Recruited target of 220 samples for Korean FDA study
Patrys	PAB	PAT-SM6 (antibody;cancer)	Confirmed that all doses from Phase I study were safe; antibody was found to cause cell death
Phosphagenics	POH	TPM/Oxycodone patch	Released results of trial in 45 subjects; patch delivered 4.5 times more oxycodone than prototype developed a year ago
Prana Biotechnology	PBT	PBT-2 (Alzheimer's Disease)	Initiated dosing in Phase II imaging trial; 40 pts
Prima Biomed	PRR	Cvac	Enrolled first patient in Phase III study;800 pts
Starpharma Holdings	SPL	Vivagel	Commenced two concurrent Phase III trials of Vivagel for the treatment of bacterial vaginosis; each trial enrolling ~220 pts

## **Biota Holdings – Positive Results from Phase II Rhinovirus Trial**

Biota Holdings (BTA: \$1.00) has achieved positive results from its Phase II trial with BTA798 for the treatment of rhinovirus infection (common cold) in patients with asthma. The trial delivered statistically significant results in its primary endpoint, that being the severity of symptoms associated with infection.

The primary endpoint, called WURSS-21 (Wisconsin Upper Respiratory Symptom Survey-21) delivered a statistically significant result ( $p=0.028$ ) over days two to four, which is the peak period of infection.

Overall, peak symptoms were reduced from 2.5 days in the placebo group to 1.7 days in the BTA798 treatment group. On day 3, 91.4% of the placebo group were confirmed with still having a rhinovirus infection compared to only 74.4% of people in the treatment group still having a confirmed infection. All participants who contributed to the final analysis were confirmed as having a rhinovirus infection prior to treatment.

With respect to asthma medication use, there was a reduction at day three, and this reduction was statistically significant at day 13, with the control group taking about half the asthma medication as the control group.

Biota is now looking at initiating Phase III trials with BTA798 together with holding partnering discussions. To date it has invested around \$25 million in the development of BTA798, including \$18 million in this trial, which was completed \$7 million under budget. CEO Peter Cook believes a licensing deal would more than recover this cost.

### **Discussion**

Trial design in this area can be challenging because the number of strains of rhinoviruses and the difficulty in assessing efficacy and in some cases, the level of infection. There have not been many examples of successfully conducted rhinoviruses trials to emulate.

The design and implementation of the clinical trial was highly successful. The trial delivered on the primary endpoint and also a number on secondary endpoints.

These results may be the closest any group has come to deliver-

ing an effective treatment for the common cold. While pharmacoeconomics may not support the cost of such a therapy for a broader population, a subset of the population with medical need, such as those with asthma, COPD or cystic fibrosis, may well support the commercialisation of such a therapy.

Details that still need to be determined include the clinical relevance of this trial outcome, whether the therapeutic outcome is sufficient to deliver a viable commercial product in this setting, and possibly more dose ranging studies to assess the most effective dose. More analysis of the results is expected to provide further information on the potential of BTA798.

### **Inavir Sales**

Sales of the long acting flue drug Inavir in Japan in the first quarter of this year will be worth noting. **Daiichi Sankyo** sells the drug in Japan and Biota receives a 4% royalty. Outside of Japan the two companies share rights, although Biota has been granted a US\$231 million US BARDA contract to develop the drug for the US market.

Peter Cook said Daiichi Sankyo is putting considerable effort into marketing the drug in Japan. Sales of the drug in this quarter (results should be out in late April) will be interesting to note for not only the level of sales, but also the level of market share the drug is taking away from incumbent products Relenza and Tamiflu. Inavir needs only to be taken once where Relenza and Tamiflu need to be taken twice daily for five days. The latter is important as it will show the potential for the drug outside of Japan.

### **Re-stockpiling Orders**

Another factor to cause an uplift in Biota's share price is restocking of expired doses of Relenza by governments, particularly in the US, and also a rebalancing to a more equal proportion of Relenza and Tamiflu. The timing of these orders is difficult to predict, but there is a strong likelihood that this will occur in the next 24 months, before Biota's royalties cease in the US in 2014.

Biota is capitalised at \$181 million. It had cash of \$56.5 million at the end of last year.

*Bioshares* recommendation: **Speculative Buy Class A**

**Bioshares**

## **Alchemia – “A Great Year Ahead”**

Alchemia (ACL: 51 cents) gave a presentation to investors this week. The company appears very confident about its future now having successfully brought its first product to market, fondaparinux (fonda), and having raised sufficient funds to complete its first Phase III trial of its HyACT technology.

Fonda profits are expected to be between \$20 - \$30 million a year for Alchemia. The first cheque should arrive in May, although this will be small with costs of development by its partner Dr Reddy's to be repaid first. The first large payment should arrive in August (and then every three months). And the even better news for investors is that the first \$70-\$80 million will be tax free due to current tax losses the company holds.

Most of the company's presentation by CEO Peter Smith was on the company's oncology drug development pipeline, which is where the value creation will now come from for the company. The company is finalising the structure for the spin out of the HyACT oncology assets – Alchemia Oncology – to better realise the value of all of the company's assets.

The fonda revenue will become a type of annuity stream for shareholders, with shareholders also to receive shares in the spinout of 'Alchemia Oncology'. The spinout is expected to make a share market listing at the time of demerging. This will obviously depend on market conditions, which at this stage look very good. With Alchemia's assets then primarily its fonda revenue, it opens the way for an acquisition of the fonda income asset. Our view is that any acquisition should be made on market with an open bid for the company.

### **HA-Irinotecan Phase III Trial**

Alchemia has commenced its 390 patient HA-Irinotecan trial in patients with metastatic colorectal cancer. The first 20 patients have been treated, as part of the initial safety analysis, and there have been no serious adverse events. Recruitment is expected to be completed at the end of this year. Results are expected in the third quarter of 2013. Alchemia is expecting the data to emerge from this Phase III trial 'lightening fast'.

### **Phase III trial Design Rationale**

In Alchemia's Phase II trial with HA-Irinotecan, the result delivered an increase of 12 weeks in progression-free survival (PFS). As a general rule-of-thumb in pharmaceutical drug development, the result in a Phase III oncology trial can be expected to be half the result seen in the Phase II trial. Alchemia has powered the study to achieve a better than six week improvement in PFS. It has surveyed 95 oncologists and found that between 55%-60% would prescribe HA-Irinotecan if the company could show a six week improvement in PFS.

The FDA and the EMA, have both indicated that PFS may be an acceptable endpoint for approval, presumably if results generate sufficient clarity. The company is developing the drug via the 505 (b) (2) route, which means among other things that the company is not required to physically conduct trials in the US in order to gain approval.

The market for HA-Irinotecan in metastatic colorectal cancer is estimated at \$500 million a year, with the opportunity to expand use in the treatment of other cancers, including breast cancer. HA-Irinotecan is expected to replace irinotecan, which is now a generic drug. Before it became generic, the branded version, Camptosar, generated peak sales of \$970 million for Pfizer. HA-Irinotecan would be priced at a premium to generic irinotecan.

### **Summary**

Peter Smith believes it will be a great year for Alchemia, with the company now more in control of its news flow (i.e. not waiting for any regulatory decisions). The upside for Alchemia is in the HyACT platform. The first Phase III trial result is very important for the company. Not only will it advance the company's plan to sell the drug into a \$500 million a year market, but it will also validate the use of hyaluronic acid (HA) to target tumours by using other oncology drugs as a payload. The company has demonstrated in preclinical studies that the technology works with more than 16 other existing cancer drugs.

Alchemia is capitalised at \$143 million.

*Bioshares* recommendation: **Speculative Buy Class A**

### **Alchemia's Structuring Options**

Alchemia has indicated it intends to spin out the oncology assets into a separate company, Alchemia Oncology. The primary reason for this move is to maximise shareholder value. Alchemia will continue to trade on the ASX under a skeleton structure, where most of the fonda revenues will flow through to shareholders.

The decision by the company is surprising, given the company now has the funds to complete the Phase III HA-Irinotecan trial. It's also surprising given the results from the trials will be available within 18 months and there will be no further drain on the fonda revenues, unless the results are positive and the company decides to expand the HyACT clinical programs.

We have previously stated that an alternative is for the oncology assets to remain in Alchemia, with the fonda revenue being distributed to shareholders, and shareholders being given an option to reinvest dividends into the oncology pipeline. Another option is to hold on to the oncology assets until the Phase III data is released. If positive, it would allow the company to spin the asset out at a much greater valuation.

Whether it is the best decision or not will depend on what type of valuation can be achieved for Alchemia Oncology. The investment market for biotechs at the moment is more positive where later stage assets are involved. If the company is able to raise considerable funds for the HyACT program, it will place the company in a better position to continue or broaden development of the HyACT assets, should the current Phase III trial not clearly meet its endpoint.

*(A table summarising these options can be found on the next page.)*

*Cont'd over*

**Alchemia Structuring Options**

	Pros	Cons
Maintain current structure	Retains full upside in HyACT Greater financial capacity to execute on HyACT programs	No or low er dividends to shareholders
Spinout Alchemia oncology	Greater certainty for other HyACT programs if Alchemia Oncology can raise sufficient funds, should current Phase III trial not meet clear endpoint  Distributes majority of fonda revenue directly to shareholders	Dilution to shareholders  Removes capacity for fonda revenue to fund further clinical development of HyACT
Spinout Alchemia oncology after Phase III trial result	Less dilution for shareholders if Phase III result is positive and unambiguous	No capacity to continue HyACT program if negative or ambiguous Phase III result
Maintain current structure, but distribute fonda revenue with option for reinvestment of dividends	Dividends received  Tax losses utilised  Maintain upside in HyACT program Option for shareholders to continue to fund HyACT	Some dilution of fonda dividend revenue for those not reinvesting dividends  No capacity to continue HyACT program if negative or ambiguous Phase III result

**Australian Biotech's Late Stage Clinical Assets**

In last week's edition of *Bioshares*, we provided a table of Australian biotech's late stage clinical drug assets, including those drugs that had in recent years been approved or acquired.

Two companies were omitted from that list. They are Alchemia, which has now commenced a Phase III trial with HA-Irinotecan in patients with metastatic colorectal cancer, and Medical Developments International, whose Pentrox product for the treatment of acute pain associated with trauma, is on the market in Australia, New Zealand and some other smaller territories. It is also conducting a pivotal study in Europe.

For completeness, we have provided an updated table of these companies.

**Bioshares****Australia's Drug Development Progress**

	Company	Drug Candidate	Stage of Development
1	Starpharma	Vivagel for treatment of bacterial vaginosis	Phase III started
2	Mesoblast	Heart failure stem cell therapy	Phase III trial due to commence
3	Phosphagenics	Oxycodone patch	Phase III trial due to begin 2012
4	Prima Biomed	Ovarian cancer vaccine	Phase III trial underway
5	QRxPharma	MoxDuoIR pain therapy	NDA submitted in US
6	Pharmaxis	Bronchitol for treatment of cystic fibrosis	Approved in Aust. & recommended for approval in Eu.
7	Clinuvel Pharmaceuticals	Scenesse for treatment of EPP severe sun intolerance	On market in Italy, filed for approval in Europe
8	Psivida	Iluvien for diabetic macular edema	Approval declined in USA, recommended for approval in Europe for chronic DME
9	Acrux	Axiron testosterone lotion	On market in USA
10	Biota Holdings	Relenza flu drug	On market globally
11	Biota Holdings	Laninamivir 2nd gen. flu drug	Fully funded end Phase III for US
12	Peplin	Picato (PEP005)	Approved by FDA 2012. Acquired by Leo Pharmaceuticals
13	Chemgenex Pharmaceuticals	Omapro	Completed clinical development. Acquired by Cephalon.
14	Alchemia	HA-Irinotecan for metastatic colorectal cancer	390 patient Phase III trial started
15	Medical Developments	Prenthrox for treatment of acute pain in trauma setting	On market in some countries, pivotal trial underway in Europe

**Bioshares Model Portfolio (30 March 2012)**

Company	Price (current)	Price added to portfolio	Date added
QRxPharma	\$1.72	\$1.66	October 2011
Mayne Pharma Group	\$0.300	\$0.435	September 2011
AcruX	\$3.99	\$3.37	June 2011
Bioniche	\$0.60	\$1.35	March 2011
Somnomed	\$0.86	\$0.94	January 2011
Phylogica	\$0.047	\$0.053	September 2010
Biota Holdings	\$1.00	\$1.09	May 2010
Tissue Therapies	\$0.44	\$0.21	January 2010
Atcor Medical	\$0.08	\$0.10	October 2008
Bionomics	\$0.46	\$0.42	December 2007
Cogstate	\$0.27	\$0.13	November 2007
Sirtex Medical	\$5.20	\$3.90	October 2007
Clinuvel Pharmaceuticals	\$1.79	\$6.60	September 2007
Pharmaxis	\$1.33	\$3.15	August 2007
Universal Biosensors	\$0.74	\$1.23	June 2007
Alchemia	\$0.510	\$0.67	May 2004

**Portfolio Changes – 30 March 2012****IN:**

Osprey Medical is due to list on Monday 16 April. We will add Osprey to the model portfolio at its issue price of 40 cents a share.

**OUT:**

We expect Impedimed will need to raise more funds in the next quarter. We have removed it from the portfolio with our expectation that next raising may be at a discount to its current price and cause some downward pricing pressure.

**Hunter Immunology/Probiomics to Relist on ASX; New Name – Bioxyne**

Hunter Immunology has completed a merger with listed biotech Probiomics. Probiomics is due to re-list on the ASX next week. The company will change its name to Bioxyne when shareholder approval is received. The company is expected to have an indicative market value on listing of \$37 million based on an independent experts' report conducted during the merger process.

Hunter's technology is an oral vaccine which triggers a cascading immune system response from the intestine. A T-cell immune system response is activated which migrates from the intestine through the common mucosal system in the body and fights bacterial colonisation in the lungs. The T-cells initiate action by neutrophils and macrophages which destroy bacteria seeking to colonise the common mucosal system.

This is an elegant explanation of how this part of the immune system works. In Phase IIa studies in trials in chronic pulmonary obstructive disorder (COPD), the company achieved very promising results, where antibiotic use was reduced by 68%, hospitalisations were reduced by more than 80% (compared to 20% in the placebo group), and cortico-steroid use fell by 77% (compared to a 40% reduction in the placebo group).

Hunter has completed recruitment in a 320 patient Phase IIb study in patients with moderate-to-severe COPD. The trial started in 2010 and was fully recruited in May 2011. The data will be unblinded in May this year and results are expected in June. It will be a major milestone for the merged company.

There is a lot of interest from pharmaceutical companies in the area of COPD. Major sufferers of COPD are smokers, who have deteriorated lungs which provide a breeding ground for bacteria.

One of the reasons for completing the merger prior to the release of the major Phase IIb study results is that it gives the company the option to consider either partnering the program, or to raise funds to move into Phase III studies if results are positive. The company's preferred option at this stage is to partner the program.

*Bioshares* recommendation: **Speculative Buy Class C**

**Bioshares**

## **The Australian Listed Life Sciences Sector**

**March 31, 2012: Capitalisation \$36.6 billion, 100 companies**

### Bioshares Large Cap. Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/3/12
CSL	CSL	18,542	Manufactures pharmaceutical products including vaccines and human plasma fractions	12%	0%	\$35.89
Resmed Inc.	RMD	4,413	Manufactures diagnostic and treatment equipment for sleeping disordered breathing	21%	3%	\$3.00
Cochlear	COH	3,524	Manufactures cochlear hearing implants	0%	-25%	\$61.90
Sigma Pharmaceuticals	SIP	744	Pharmaceutical manufacturing and wholesaling	15%	29%	\$0.63
<b>Capitalisation Total</b>		<b>27,223</b>				

### Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/3/12
Mesoblast	MSB	2,233	Developing therapies based on mesenchymal pre-cursor stem cells, with applications in cartilage regrowth and heart and bone repair.	14%	8%	\$7.85
Heartware International	HIN	895	Developing a mechanical heart pump (LVAD)	-4%	-25%	\$1.81
Acrux	ACR	663	Developer of the transdermal drug products Axiron, Evamist/Ellavie and Recuvyra	39%	32%	\$3.98
Starpharma Holdings	SPL	483	Developer of pharmaceutical applications of chemical scaffolds known as 'dendrimers'.	51%	39%	\$1.72
Blackmores	BKL	462	Manufactures vitamin, mineral and herbal supplements and skin & hair products in Australia and N.Z.	-3%	-8%	\$27.55
Pharmaxis	PXS	402	Marketing a lung function test, Aridol, and developing the Bronchitol product to treat cystic fibrosis, bronchiectasis and COPD.	26%	-51%	\$1.32
GI Dynamics	GID	295	Commercialising the Endobarrier, an implantable polymer liner for the management of obesity and diabetes	-5%		\$1.05
Sirtex Medical	SRX	290	The company's core technology uses radioactive particles to irradiate tumours in the liver. Approved for use in most major regions.	16%	-2%	\$5.20
Unilife Corporation	UNS	263	Developer of retractable syringes	22%	-28%	\$0.62
Prima Biomed	PRR	256	Developing the CVac immunotherapy.	50%	-13%	\$0.24
QRxPharma	QRX	249	Developing a 'dual opioid' drug to treat moderate to severe pain.	14%	11%	\$1.72
Phosphagenics	POH	239	Commercialising a platform technology (alpha-tocopherol) that improves the delivery of pharmaceutical and other products across the skin.	12%	114%	\$0.24

## Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/3/12
Reva Medical	RVA	228	Developing a bioresorbable coronary stent	-37%	-49%	\$0.69
Biota	BTA	182	Developer of anti-infective drugs, including the flu drug Relenza. Inavir, developed with Daiichi Sankyo, a long acting flu drug now approved in Japan.	25%	-5%	\$1.00
Bionomics	BNO	166	Developing drugs to treat cancer and CNS diseases, and has also developed a gene diagnostic for epilepsy.	-19%	-8%	\$0.48
API	API	151	Pharmaceutical wholesaler	17%	-3%	\$0.31
Alchemia	ACL	143	Biopharmaceutical company with a revenue generating product, generic fondaparinux, and a pipeline of targeted chemotherapy drugs employing its HyACT technology. Lead product HA-Irinotecan in a pivotal Phase III trial for colorectal cancer	70%	-26%	\$0.51
Nanosonics	NAN	124	Developing a novel disinfection technology, the first product is a point of care ultrasound probe disinfection unit	-10%	-42%	\$0.54
Universal Biosensors	UBI	118	Development, manufacture and commercialisation of a range of in vitro diagnostic tests for point-of-care use	-1%	-41%	\$0.74
Impedimed	IPD	78	Develops devices that aid the diagnosis of secondary lymphoedema, muscle wasting and other disorders	-5%	-33%	\$0.50
Tissue Therapies	TIS	74	Developing the VitroGro product for ulcer and wound healing	14%	-38%	\$0.44
Bioniche	BNC	62	Developing a bladder cancer treatment and food safety vaccine; sale of veterinary products	-8%	-56%	\$0.60
Anteo Diagnostics	ADO	62	Developer of a biological coatings technology that can be applied to immunoassays, bio-separations, drug delivery and other medical devices	9%	16%	\$0.08
Clovercorp	CLV	59	Development and production of omega-3 food additives from tuna oil.	20%	20%	\$0.36
Avita Medical	AVH	57	Markets ReCell, a skin repair product	92%	118%	\$0.24
Clinuvel Pharmaceuticals	CUV	56	Developing an analogue of the alpha-MSH protein, named Scenesse, as a photo-protective agent	15%	-2%	\$1.79
Prana Biotechnology	PBT	46	Developing drugs to treat CNS diseases such as Alzheimer's and Parkinson's	0%	-38%	\$0.16
Mayne Pharma Group	MYX	46	Developing an improved dosing anti-fungal drug, Subazole and operating manufacturing services	-23%	-54%	\$0.30
Genetic Technologies	GTG	43	Provides DNA paternity testing services and holds broad patents relating to the use of non-coding DNA.	-16%	5%	\$0.09



## Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/3/12
Sunshine Heart	SHC	43	Developing the C-Pulse heart assist device. The C-Pulse wraps around and compresses the aorta, increasing blood flow through the body.	-6%	-19%	\$0.03
pSiVida	PVA	40	Developing drug delivery technologies, with a special focus on ophthalmic applications	55%	-52%	\$1.94
Somnomed	SOM	36	Markets an oral device for the treatment of sleep apnea and snoring.	-5%	-22%	\$0.86
Medical Developments	MVP	30	Commercialising the Pentrox inhaler for temporary pain relief. Used widely in ambulances across Australia.	-3%	33%	\$0.56
Viralytics	VLA	28	Developing a cancer treatment based on the application of viruses (oncolytic virus technology)	12%	-15%	\$0.38
Living Cell Technologies	LCT	28	Developing cell therapies for diabetes, haemophilia and Huntington's disease	74%	0%	\$0.08
Neuren Pharmaceuticals	NEU	28	Developing neuroprotective therapeutics	-11%	50%	\$0.02
Avexa	AVX	26	Developing an HIV drug, apricitabine	0%	-38%	\$0.03
Allied Health Group	AHZ	25	Formed through the merger of Allied Medical and BioMD. Diversified medical products group.	-28%	-47%	\$0.03
Biotron	BIT	25	Developing a compound to treat HCV	36%	48%	\$0.17
Scigen	SIE	25	Developer and manufacturer of biopharmaceuticals. Company is based in Singapore and was spun out of Sonic Healthcare in 2002.	-34%	-59%	\$0.05
OBJ	OBJ	24	Developing transdermal drug delivery technologies	17%	5%	\$0.02
Brain Resource Corp	BRC	23	Development and commercialisation of functional brain analysis techniques	11%	-28%	\$0.26
Consegna Group	CGP	23	Asset development company, with interests in Vibrovein, Linguet, BreatheAssist and Aspen Medisys. (Formerly Helicon Group)	-19%	-3%	\$0.03
Circadian Technologies	CIR	23	Developing drugs, including antibodies, around the VEGF C and VEGF D targets	4%	-30%	\$0.49
Phylogica	PYC	21	Developing peptide compound libraries for use in human therapeutics.	18%	-30%	\$0.05
Antisense Therapeutics	ANP	20	Developing antisense compounds to treat multiple sclerosis and acromegaly	-22%	38%	\$0.02
Cogstate	CGS	20	Marketing cognitive performance diagnostic products	13%	50%	\$0.27

## Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/3/12
Calzada	CZD	20	Holds a 100 % stake in PolyNovo, a polymer chemistry company.	4%	14%	\$0.06
Cbio	CBZ	20	Drug development company, focus is on Xtoll product for rheumatoid arthritis	32%	-88%	\$0.08
Optiscan Imaging	OIL	20	Manufacture of confocal microscopes for clinical diagnosis	8%	181%	\$0.14
Vita Life Sciences	VSC	19	Development, manufacture and distribution of prescription and OTC medicines as well as complementary and alternative medicines, dietary supplements and health foods	10%	14%	\$0.32
Bluechiip	BCT	18	Development, manufacture and commercialisation of a tracking system for biological samples	-16%		\$0.21
Benitec Biopharma	BLT	17	R&D company focusing on gene silencing, specifically DNA delivered RNAi, technology	20%	-36%	\$0.02
Asian Ctr for Liver Diseases and Transpl.	AJJ	17	Manages liver treatment centres in Asia. Not previously included in these tables. Made a backdoor listing through Costarella Design in 2009.	-10%	-36%	\$0.09
ITL	ITD	16	Develops and distributes medical devices such as safety equipment to prevent needle stick injuries and sterile preparation kits.	23%	96%	\$0.14
Ellex Medical Lasers	ELX	16	Develops, manufactures and markets solid state ophthalmic lasers used to treat secondary cataracts and retinal disorders.	46%	-5%	\$0.19
Probiotec	PBP	16	Manufacturer, marketer and distributor of a range of over the counter (OTC) pharmaceuticals, complementary medicines and speciality ingredients	-26%	-48%	\$0.30
Southern Dental Industries	SDI	15	Manufacture & distribution of amalgam (fillings) & other dental materials and product R&D.	-17%	-26%	\$0.13
Analytica	ALT	13	A medical devices company that has developed a retractable syringe	26%	-14%	\$0.02
Solagran	SLA	13	Developing complementary medical compounds called Bioeffectives. <b>Suspended from trading.</b>	-33%	-63%	\$0.04
IDT Australia	IDT	13	Manufacturer of pharmaceutical ingredients to international standards for major pharmaceutical groups.	-21%	-38%	\$0.31
Genera Biosystems	GBI	13	Develops, manufactures and distributes advanced molecular diagnostic tests, with a particular focus on women's health.	31%	-25%	\$0.19
Progen Pharmaceuticals	PGL	12	A developer of cancer therapeutics	0%	-41%	\$0.20
Compumedics	CMP	12	Develops, manufactures and markets sleep diagnostic and monitoring equipment.	-17%	-32%	\$0.08
Atcor Medical	ACG	11	Markets the SphygmoCor device, a noninvasive technology that provides information regarding the functioning of the cardiovascular system	-4%	-17%	\$0.08

## Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/3/12
Isona	ISN	11	Respiratory and pulmonary devices company. (Name changed from Karmelsonix)	-29%	-71%	\$0.01
Eastland Medical Systems	EMS	10	Developing the anti-malarial product ArTiMist.	-19%	-51%	\$0.02
Immuron	IMC	10	Specialises in R&D of hyper-immune bovine colostrum products for therapeutic use in animals and humans.	-42%	-61%	\$0.03
Patrys	PAB	10	Developing human antibody therapies for the treatment of lung, pancreatic, gastric and colon cancers	0%	-70%	\$0.03
Novogen	NRT	9	Developing analogues of naturally occurring phenolic hormones to treat cancers and other conditions.	-9%	-66%	\$0.09
Biodiem	BDM	9	Focused on the development of LAIV influenza vaccines	6%	-51%	\$0.09
Agenix	AGX	9	Developing a compound to treat Hepatitis B, AGX1009 and Thromboview, an imaging agent for blood clots	0%	-40%	\$0.01
Advanced Surgical Design & Manufacture	AMT	8	A developer and manufacturer of prosthetic implants and medical devices	26%	-6%	\$0.24
Cordlife	CBB	8	Managing tissue banking services in Australia and Asia	-19%	-83%	\$0.06
Cyclopharm	CYC	8	A nuclear medicine company that markets the Technegas lung imaging system	-10%	-28%	\$0.04
Cellmid	CDY	7	Developing therapies that target the midkine protein. Recently launched a range of hair loss products.	-6%	-40%	\$0.02
Medical Australia	MLA	6	Manufacture and supply of medical devices and equipment. Not previously included in these tables. Previously known as BMDI Tuta and IMD Group	-22%	-60%	\$0.01
Cryosite	CTE	6	Provides specialised storage services, especially for umbilical cord blood	-10%	30%	\$0.13
Holista Colltech	HCT	6	Has developed a novel technology for the extraction of collagen from sheepskins	0%	28%	\$0.12
Resonance Health	RHT	5	Marketing the FerriScan technology, a non-invasive tool for measuring liver iron levels	15%	-38%	\$0.02
LBT Innovations	LBT	5	Developed the MicroStreak technology for the automation of microbiology laboratory processing	39%	-13%	\$0.05
Austofix	AYX	5	Manufacturer and developer of orthopaedic fixation devices. <b>Suspended fom trading.</b>	0%	-51%	\$0.29
USCOM	UCM	5	Marketing a non-invasive heart output function monitor	34%	-70%	\$0.09

## Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/3/12
NeuroDiscovery	NDL	3	Focusing on pain drug development following management buyout of electrophysiology business	0%	-27%	\$0.03
Healthlinx	HTX	3	Detecting novel functions of known and new protein and peptides for therapeutic purposes.	-25%	-85%	\$0.01
CathRx	CXD	2	Developing novel modular cardiac catheters for the diagnosis and treatment of abnormal heart rhythms	-85%	-93%	\$0.02
Acuvax	ACU	2	Intending to acquire Biohealth, a complementary medicines company	0%	0%	\$0.001
Bone Medical	BNE	2	Developing treatments for bone and joint degenerative diseases such as arthritis and osteoporosis.	160%	-63%	\$0.01
NuSep Holdings	NSP	2	Manufacture and sale of protein separations technologies	-69%	-89%	\$0.02
Virax Holdings	VHL	2	Developing a therapeutic and prophylactic vaccine for HIV. Proposing to merge with 4G Vaccines. Suspended from trading.	-10%	-67%	\$0.01
Leaf Energy	LER	2	Plant genetic technologies business, lead product is vitronectin.	-7%	-3%	\$0.07
Actinogen	ACW	2	Early stage developer of antibiotics that show activity against MRSA and VRE bacteria	-58%	-56%	\$0.02
Medigard	MGZ	1	Developed retractable syringe technology and other safety medical products.	-6%	-63%	\$0.02
Imugene	IMU	1	Developing animal products such as antibiotic alternatives used in the stock feed industry using a vaccine and gene therapy approach	-33%	-78%	\$0.01
OMI Holdings	OMI	1	Commercialising a safety syringe	0%	-75%	\$0.002

**Capitalisation Total** 9,359

## Listed Biotech Investment Funds or Companies

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/3/12
Biotech Capital	BTC	5	The entity is now engaged in the orderly sale of assets.	-8%	-59%	\$0.07

**Capitalisation Total** 5

**Capitalisation Total - All Indices** 36,586

**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. For both groups, the rating “Take Profits” means that investors may re-weight their holding by selling between 25%-75% of a stock.

**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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