

In this edition...

It looks like it's going to be a tough year in 2009 for most investment classes, including biotech. Some of the bad news is already out, with Neuren reporting its Phase III trial failure with its lead compound. Funding will be the major issue this year for biotech companies, with 2008 seeing only 20% of the funds raised the previous year.

However there are sure to be some stocks that will grab investors' attention over the year with major milestones approaching following a severe investor workover in 2008 that many will quickly want to forget. The resulting low share price base may see some stellar returns in the companies that can get it right!

The Editors

Companies Covered: AVX, IMU, NEU, PGL

	Bioshares Portfolio
Year 1 (May '01 - May '02)	21.2%
Year 2 (May '02 - May '03)	-9.4%
Year 3 (May '03 - May '04)	70.0%
Year 4 (May '04 - May '05)	-16.3%
Year 5 (May '05 - May '06)	77.8%
Year 6 (May '06 - May '07)	17.3%
Year 7 (May '07 - May '08)	-36%
Year 8 (May '08 - current)	-35%
Cumulative Gain	35%
Av Annual Gain (7 yrs)	17.8%

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Bioshares

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

Quarterly Review

Biotech Sector Contraction Ahead in 2009

Without doubt 2008 was the worst year on record for the Australian biotech sector, as the waves of fear and uncertainty flooded global investment markets. The **Bioshares Index** fell 26.1% in the December quarter, but year on year the index fell by 60%, significantly in excess of the 41.7% drop recorded by the ASX 300 index. Much damage had already occurred in the March quarter, when the Bioshares Index fell 29.5%.

Biotech Sector KPIs

	2008	2007
No. of companies (31/12)	128	131
Biotechs >\$100M cap	9	25
Bioshares Index (change)	60.0%	-14.2%
Nasdaq Biotech Index	-9.1%	4.6%
Capital raised (\$M)	\$183	\$943
IPOs (Num)	3	11
Ave IPO raise (\$M)	\$5	\$17
CEO Separations	19	23

The Nasdaq Biotech Index has fared much better than the Bioshares Index falling 12.7% for the quarter and 12.6% for the year. The Nasdaq Biotech Index contains more mature companies than the Bioshares Index, hence the superior performance. The **Bioshares Large Cap Index** weakened in the December quarter, decreasing by 8.1%. However, year on year this index posted a loss of 11.8%, illustrating the defensive qualities of mature healthcare stocks.

Other measures which illustrate the weakened state of the biotech sector include a reduction in the number of companies capitalised at greater than \$100 million (excluding the large cap stocks such as CSL) from 25 at December 2007 to nine at December 2008. And there was a decrease in IPOs from 11 in 2007 to three in 2008. A crucial statistic was the plummet in capital raisings, from \$943 million in 2007 to \$183 million in 2008.

In the first half of 2009 the Australian biotech sector is set to experience a period of contraction as funding is expected to remain extremely tight and place pressure on many of the cash-strapped biotechs. More companies are expected to finally give serious consideration to M&A options. However, a smaller number of individual stocks with strong investment arguments and major milestones approaching are likely to grab attention during the course of 2009. In this category, we place **Cellestis**, **Atcor Medical**, **Cogstate**, **Universal Biosensors**, **Acrux**, **Mesoblast**, **Pharmaxis**, **Peplin** and **Alchemia**, although this is not a complete list.

In addition to **Chemeq**, **Portland Othopaedics** and **Apollo Life Sciences**, which have gone into administration, **Diversa** (Ambri), which has now exited the sector and **Brainz**

Index performances by quarter

	Q4 2007	Q1 2008	Q2 2008	Q3 2008	Q4 2008
Bioshares Index	-5.5%	-29.5%	-13.8%	-10.9%	-26.1%
Nasdaq Biotech Index	-2.3%	-6.5%	1.6%	5.4%	-12.7%
Bioshares Large Cap Index	3.6%	-7.3%	-7.9%	12.4%	-8.1%
ASX 300 Index	-3.4%	-15.7%	-2.6%	-12.0%	-19.3%

which has divested its assets, we expect a large number of cash strapped biotechs to also enter administration or exit the sector through a change of business in 2009. Merger with other companies is also likely, with **Avexa** and **Progen Pharmaceuticals** announcing their plan to merge on December 22. **Cordlife** subsidiary **BioCell** is to merge with a fellow Australian cord blood bank group, **CellSense**.

Capital Raisings

The flow of funds into the sector slowed dramatically in the December quarter, 2008, with a total of \$18.8 million raised. This is the second smallest quarterly inflow of funds since the December quarter 2002, when \$14 million was raised. **Cyclopharm** raised \$3.18 million through a rights issue. Cyclopharm operates an established nuclear medicine business, although capital is required to support the roll-out of its Technegas product in the US. A marketing authorisation application has been lodged with the FDA.

Capital raisings for Australian biotech

Year	Funds Raised
2002 CY	\$99 M
2003 CY	\$531 M
2004 CY	\$504 M
2005 CY	\$638 M
2006 CY	\$613 M
2007 CY	\$943 M
2008 CY	\$183 M

Benitec raised just under \$2 million, with strong support coming from a key investor.

Three IPOs were completed during 2008, the latest being Fluorotechnics, which raised \$8 million. The Fluorotechnics register includes the well known investment group **Hunter Hall**.

Capital Raisings by Australian-listed Biotech Companies Q4 2008

Company	Investment Manager or Investor	Type of raising	Funds raised (\$M)
Cyclopharm	CVC Venture Managers	Non-renounceable Rights Issue	\$3.18
Benitec		Private Placement	\$1.97
Bone Medical		Private Placement	\$1.50
Polartech		Convertible Note	\$1.19
Rockeby Biomed	Super Gateway Group	Rights Issue & General Offer	\$0.75
Viralytics		SPP	\$0.72
Occ. & Med. Innov.		Private Placement	\$0.50
Stem Cell Sciences		Secured Loan	\$0.42
Biosignal		SPP	\$0.28
Colltech		Placement	\$0.20
ChemGenex Pharm.	ABN AMRO Morgans	SPP	\$0.13
Total			\$10.8
IPOs			\$8.0
Total raised in Q4 2008			\$18.8
Total raised in Q3 2008			\$65.1
Total raised in Q2 2008			\$58.8
Total raised in Q1 2008			\$58.8
Total - 2008			\$182.8

IPOs in Q4 2008

Company	Code	Funds Raised	Issue Price	Price 31/12/08	Gain/loss
Fluorotechnics	FLS	\$8.0	\$1.00	\$0.99	-1%

Total IPOs in 2008

Company	Code	Funds Raised	Issue Price	Price 31/12/08	Gain/loss
Fluorotechnics	FLS	\$8.0	\$1.00	\$0.99	-1%
Genera Biosystems	GBI	\$5.0	\$0.50	\$0.24	-52%
Austofix	AYX	\$3.0	\$1.50	\$0.85	-43%
Total		\$16.0		Av.	-24%
Ave.		\$5.3			

Outperformers

There were just a eight stocks that performed well over the year ending December 31, 2008. **Analytica** recorded a 331% increase for the period, driven by the market release in Australia of that company's infusion device. **USCOM** posted a 67% gain and **Atcor Medical** locked in a 63% gain. **Avita Medical** shares rose 33% for period, albeit off a low base, followed by **Cogstate** (+23%), **Probiotec** (+10%), **CloverCorp** (+9%) and **Heartware** (+9%).

The theme to be observed is here is a focus on revenue generating companies (some even profitable), with all these companies, bar Heartware, selling approved goods or have established manufacturing businesses.

Bioshares

Selected Clinical Trial Developments - Dec Quarter 2008

Company	Code	Product/Therapeutic	Event
Arana Therapeutics	AAH	ART621	Commenced Phase II trial in RA; dose-ranging; 200 pts
Acrux	ACR	MD Testosterone	Completed 50% enrollment in Phase III study; 150 hypogonadal male pts
Avexa	AVX	Apricitibine	Completed recruitment of first 160 pts for two-dose component of Phase III trials; total 300 pts
Avita Medical	AVH	ReCell	Commenced 200 pt trial in France; efficacy and health economic study funded by French government
BioMD	BOD	CardioCel	Completed tenth of 10 implants
Biota	BTA	CS-8958 (LANI)	Opened centres for Phase III trial long acting flu drug in selected Asian countries
ChemGenex Pharmaceuticals	CXS	omacetaxine	Announced interim results for 44 pts in Phase II/II trial of CML pts with T315I mutation; 80% CHR in chronic phase pts
Genera Biosystems	GBI	Paptype	Completed pilot clinical study in 100 samples, comparing Paptype to Qiagen's HC2 test, a cervical cancer screening test
Halcyon Pharmaceuticals	HGN	SUBA-Itraconazole	Completed 2 of 3 PK studies under US FDA IND
Heartware International	HIN	Left ventricular assist device	Completed enrolment in EU, Aust 50 pt trial
IM Medical	IMI	Intellelheart CardioVascular Risk Assessment	Completed 2 yr study at Monash Uni with 539 pts
Mesoblast	MSB	Revascor - Allogeneic adult stem cell therapy (MPC)	Commenced 60 pt trial in congestive heart failure pts
Neuren Pharmaceuticals	NEU	Glypromate	Completed 325 pt Phase III trial; peptide had no observable effect
Peplin	PLI	PEP005 Gel	Completed enrolment in Phase III actinic keratoses trial; 250 pt
Phosphagenics	POH	Transdermal Lidocaine	Completed Phase I trial; 11 pts
Phosphagenics	POH	Phospha E - Metabolic Syndrome	Completed enrolment Phase II trial; 160 pts
pSivlda	PVA	Medidur - drug delivery device	Commenced trial in pts with dry-Age Related Macular Degeneration
QRxPharma	QRX	MoxDuoIR	Commenced comparison study against equivalent doses of morphine and oxycodone; 180 pts
Sunshine Heart	SHC	C-Pulse	Received IRB approval from Jewish Hospital, University of Louisville, Kentucky
Tissue Therapies	TIS	VitroGro - Wound healing	Commenced trial in Canada
Tissue Therapies	TIS	VitroGro - Wound healing	Commenced trial in Perth; 4 pts treated
Ventracor	VCR	VentrAssist	100th EU pt implanted [as of 5 Nov]; 140 pts implanted in US; total 382 pts implanted to date [as of 28 Nov]
Virax Holdings	VHL	VIR201	Commenced Phase I/IIa Sth African HIV immunotherapeutic vaccine trial; 140 pts



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Selected Clinical Trial Developments - Sept Quarter 2008

Company	Code	Product/Therapeutic	Event
Clinuvel	CUV	afamelanotide	Commenced Phase II trial - photodynamic therapy; 30 pts
Cytopia	CYT	CYT997	Commenced Phase II trial in pts with glioblastome multiforme; 35 pts
Heartware International	HIN	Left ventricular assist device	Commenced US 150 pt bridge-to-transplant trial
Mesoblast	MSB	Autologous adult stem cell therapy (MPC)	Completed Pilot trial in 11 pts with non-healing long bone fractures
Peplin	PLI	PEP005 Gel	Commenced enrolment in Phase III actinic keratoses trial; 250 pt
Pharmaxis	PXS	Bronchitol	Commenced second Cystic Fibrosis Phase III trial; 325 pts
Pharmaxis	PXS	Bronchitol	Completed enrolment in first Cystic Fibrosis Phase III trial; 325 pts
Starpharma	SPL	Vivagel	Commenced time-scale activity study in healthy volunteers; 12 pts
Viralytics	VLA	Cavatak	Completed dosing in 2nd of 3 sets of cancer pts; 13 pts dosed in first two groups

Note, due to space limitations that this table was omitted from the last Quarterly Review edition

Bioshares Model Portfolio (2 January 2009)

Company	Price (current)	Price added to portfolio	Date added
ASDM	\$0.35	\$0.30	December 2008
QRxPharma	\$0.20	\$0.25	December 2008
Hexima	\$0.43	\$0.60	October 2008
Atcor Medical	\$0.15	\$0.10	October 2008
CathRx	\$0.50	\$0.70	October 2008
Impedimed	\$0.75	\$0.70	August 2008
Mesoblast	\$1.00	\$1.25	August 2008
Cellestis	\$1.75	\$2.27	April 2008
IDT	\$1.74	\$1.90	March 2008
Circadian Technologies	\$0.58	\$1.03	February 2008
Patrys	\$0.10	\$0.50	December 2007
Bionomics	\$0.25	\$0.42	December 2007
Cogstate	\$0.16	\$0.13	November 2007
Sirtex Medical	\$1.68	\$3.90	October 2007
Clinuvel Pharmaceuticals	\$0.25	\$0.66	September 2007
Starpharma Holdings	\$0.20	\$0.37	August 2007
Pharmaxis	\$1.29	\$3.15	August 2007
Universal Biosensors	\$0.63	\$1.23	June 2007
Biota Holdings	\$0.36	\$1.55	March 2007
Probiotec	\$1.49	\$1.12	February 2007
Peplin Inc	\$0.35	\$0.83	January 2007
Arana Therapeutics	\$0.85	\$1.31	October 2006
Chemgenex Pharma.	\$0.47	\$0.38	June 2006
Cytopia	\$0.18	\$0.46	June 2005
Acrux	\$0.48	\$0.83	November 2004
Alchemia	\$0.16	\$0.67	May 2004

Portfolio Changes – 2 Jan 2009

IN:
No changes

OUT:
No changes

Updates

Progen and Avexa to Merge

Forced consolidation of the Australian biotech sector has started as a result of the global financial crisis. In 2008, the biotech sector raised only 20% of the funding compared to the previous year. Funding for early stage projects has become scarce, and funds for later stage programs might be available where management has shown a reliable track record.

Two companies that disappointed the market in 2008 were Progen Pharmaceuticals and Avexa and these companies have announced plans to merge. It's a surprising combination for a number of reasons. Firstly Progen is a focused oncology company and Avexa is focused in the area of antiviral drug development, primarily HIV. The only commonality is that both companies are working with small molecule compounds.

For Avexa it provides very welcomed additional funding for its lead Phase III HIV trial at a time when funding is scarce and many of its major shareholders are likely to have been disappointed by the company's progress. However for Progen it's a peculiar choice. Not only are there no disease focus synergies, but the additional funds Progen will be providing to Avexa's lead HIV program will only be sufficient to complete the first Phase III trial to the 24 week point.

The Avexa chairman, Nathan Drona, and CEO Julian Chick will maintain their positions in the new entity which is appropriate however including three Progen directors on the combined entity is questionable.

The merger terms include a planned \$20 million share buyback at \$1.10 a share after which point the companies will merge with Progen Shareholders owning 56% of the merged entity and Avexa shareholders 44%. Existing Avexa directors will hold a majority of the board seats (four versus three).

The additional funding will give the company more time and data to license/partner its lead HIV program. The proposed merged entity will have projected funds totaling \$60 million.

Some Progen shareholders may well be disappointed of the change of disease focus from oncology to HIV when other merger opportunities in the oncology area are available. Whilst the lead program is at a late stage of development, that the projected funds in the new entity will not allow completion of the clinical development of the HIV lead compound (ATC) leaves considerable pressure of completing a mid Phase III licensing deal for the proposed merged entity, to be renamed Avexa Pharmaceuticals. The share buyback of \$20 million will represent just under 30% of Progen's cash reserves in February 2009 and will be bound to disappoint those investing for Progen's high cash backing. .

Bioshares recommendation: **Avoid**

Neuren Pharmaceuticals – Phase III trial fails

New Zealand biotech, Neuren Pharmaceuticals, delivered a failed result in its Phase III trial with its lead compound, a naturally occurring peptide found in the brain called Glypromate. The trial

was seeking to show that Glypromate could reduce the level of cognitive damage associated with heart surgery.

One of the main problems with the trial is that the patients did not experience the cognitive decline expected across the board, as had been suggested in a major published clinical study. The Neuren study showed that Glypromate had 'no observable effect', perhaps one of the most feared terms in the world of drug development.

Neuren had only NZ\$4.1 million in cash at the end of September 2008. It will focus now on its follow-up compound, NNZ-2566, for the treatment of traumatic brain injury. However with this compound being a synthetic analogue of Glypromate, the outlook for Neuren is looking somewhat hazy and uncertain for 2009.

Bioshares recommendation: **Avoid**

Imugene Update

There was one piece of positive news to round out the most punishing of years for biotech investors. Imugene (IMU: 8.5 cents), which has been commercialising vaccines for use in the production animal industries, signed an exclusive deal with **Merial**, a large animal health business. The deal gives Merial access to Imugene's technology platform and R&D staff. In exchange, Imugene receives an initial payment of \$2.9 million, and a potential total contract value to Imugene over seven years in excess of \$30 million. For any product that eventuates from the alliance, Imugene stands to gain royalties at a base rate of 5-6% as well as milestone payments. Four products are currently covered by the deal.

The deal is a significant validation of the Imugene technology, which originated from the CSIRO, and also the Imugene business model, which has been to develop products that are of relevance to potential partners, supported by data that is packaged appropriately. The deal also vastly de-risks Imugene's funding requirements.

Bioshares recommendation: **Speculative Buy Class B**

Bioshares

The Australian Listed Life Sciences Sector

December 31, 2008: Capitalisation \$32.3 billion, 128 Companies

Bioshares Large Cap. Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/08
CSL	CSL	20,321	Manufactures pharmaceutical products including vaccines and human plasma fractions	-10%	-7%	\$33.70
Resmed Inc.	RMD	4,357	Manufactures diagnostic and treatment equipment for sleeping disordered breathing	-1%	-10%	\$5.36
Cochlear	COH	3,101	Manufactures cochlear hearing implants	-7%	-26%	\$55.40
Sigma Pharmaceuticals	SIP	936	Pharmaceutical manufacturing and wholesaling.	-10%	-32%	\$1.08
Capitalisation Total		28,715				

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/08
Pharmaxis	PXS	235	Marketing a lung function test, Aridol, and developing the Bronchitol product to treat cystic fibrosis, bronchiectasis and COPD.	-46%	-71%	\$1.21
Blackmores	BKL	215	Manufactures vitamin, mineral and herbal supplements and skin & hair products in Australia and N.Z.	-24%	-39%	\$13.19
Arana Therapeutics	AAH	194	Developing biologic therapeutic products for the treatment cancer and inflammatory diseases	1%	-28%	\$0.83
Heartware International	HIN	186	Developing a mechanical heart pump (LVAD)	-3%	9%	\$0.60
Cellestis	CST	168	Marketing a diagnostic for latent tuberculosis	-19%	-43%	\$1.75
Mesoblast	MSB	121	Developing therapies based adult stem cells called mesenchymal stem cells, with applications in cartilage regrowth and bone repair.	-9%	-22%	\$1.00
ChemGenex Pharmaceuticals	CXS	111	Developer of the drug Omacetaxine, which has potential to treat CML patients that develop the T315i mutation.	-35%	-56%	\$0.47
API	API	108	Pharmaceutical wholesaler	-34%	-77%	\$0.42
Peplin	PLI	106	Developing a plant derived compound, PEP005, to treat non-melanocytic skin cancers.	-19%	-60%	\$0.35
Sirtex Medical	SRX	94	The company's core technology uses radioactive particles to irradiate tumours in the liver. Approved for use in most major regions.	-18%	-63%	\$1.69
Universal Biosensors	UBI	93	Development, manufacture and commercialisation of a range of in vitro diagnostic tests for point-of-care use.	-16%	-60%	\$0.59
Acrux	ACR	76	A Pooled Dev. Fund commercialising a drug delivery technology that uses sunscreen penetration enhancers to aid transdermal drug delivery.	-49%	-66%	\$0.48
Institute of Drug Technology	IDT	73	Manufacturer of pharmaceutical ingredients to international standards for major pharmaceutical groups.	-16%	-31%	\$1.70
Clinuvel Pharmaceuticals	CUV	73	Developing an analogue of the alpha-MSH protein as a photo-protective agent	4%	-30%	\$0.24
Probiotec	PBP	72	Manufacturer, marketer and distributor of a range of over the counter (OTC) pharmaceuticals, complementary medicines and speciality ingredients	3%	10%	\$1.49
Novogen	NRT	70	Developing analogues of naturally occurring phenolic hormones to treat cancers and other conditions.	-38%	-44%	\$0.69

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/08
Impedimed	IPD	65	Develops devices that aid the diagnosis of secondary lymphoedema, muscle wasting and other disorders	4%	-5%	\$0.75
Prana Biotechnology	PBT	64	Developing drugs to treat CNS diseases such as Alzheimer's and Parkinson's	-27%	-38%	\$0.32
Biota	BTA	58	Commercialised Relenza anti-flu drug and flu diagnostic kits. Now developing an improved version.	-51%	-73%	\$0.34
Bionomics	BNO	53	Developing drugs to treat cancer and CNS diseases, and has also developed a gene diagnostic for epilepsy.	-30%	-46%	\$0.23
Unilife Medical Solutions	UNI	52	Developer of retractable syringes.	-17%	-30%	\$0.24
Phosphagenics	POH	51	Commercialising a drug delivery technology improving the delivery of vitamin E and existing pharmaceutical products through phosphorylation.	17%	-68%	\$0.08
Progen Pharmaceuticals	PGL	46	To merge with Avexa	7%	-70%	\$0.77
Polartechinics	PLT	45	Develops and commercialises medical instruments to diagnose pre-cancer and cancer, in particular cervical cancer and melanomas.	84%	-54%	\$0.18
Ascent PharmaHealth	APH	42	Formerly GenePharm. A generic pharmaceutical manufacturer and distributor.	-15%	-52%	\$0.17
Nanosonics	NAN	38	Developing a novel disinfection technology. The first product is a point of care ultrasound probe disinfection unit.	5%	-66%	\$0.20
Starpharma Holdings	SPL	35	Developer of pharmaceutical applications of chemical scaffolds known as 'dendrimers'.	-28%	-51%	\$0.20
Solagran	SLA	35	Developing complementary medical compounds called Bioeffectives.	-60%	-86%	\$0.16
Avexa	AVX	32	Developing antiviral therapies for HIV and Hepatitis B and a novel antibiotic. To merge with Progen Pharmaceuticals.	-54%	-86%	\$0.07
Hexima	HXL	32	Research and development of genetic technologies that can enhance the resistance of crops to insects and fungal pathogens.	-43%	-61%	\$0.43
Clovercorp	CLV	30	Development and production of omega-3 food additives from tuna oil.	-33%	9%	\$0.18
Southern Dental Industries	SDI	30	Manufacture & distribution of amalgam (fillings) & other dental materials and product R&D.	32%	-43%	\$0.25
Fermiscan Holdings	FER	29	Commercialising the use of x-ray diffraction to aid in the screening of breast cancer.	-33%	-80%	\$0.20
Circadian Technologies	CIR	26	Developing drugs, including antibodies, around the VEGF C and VEGF D targets.	-28%	-52%	\$0.58
Alchemia	ACL	26	Commercialising new solid phase carbohydrate synthesis technology. First product, a synthetic heparin, to be launched by partners in 2008.	-27%	-77%	\$0.16
pSiVida	PVA	24	Developing drug delivery technologies, with a special focus on ophthalmic applications. From late June pSiVida redomiciled to USA. Shares trade as 1:1 CDIs after 40:1 reconstruction	-34%	-63%	\$1.32
Living Cell Technologies	LCT	24	Developing cell therapies for diabetes, haemophilia and Huntington's disease.	-35%	-73%	\$0.10
Fluorotechnics*	FLS	24	Development and sale of scientific equipment and consumables, including fluorescent stains.	-1%		\$0.99
Cordlife	CBB	23	Rolling out tissue banking services in Australia and Asia	-27%	-61%	\$0.26

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/08
CathRx	CXD	21	Developing novel modular cardiac catheters for the diagnosis and treatment of abnormal heart rhythms	-32%	-81%	\$0.50
Ventracor	VCR	21	Developer of the VentrAssist device, an artificial heart assist device (LVAD).	-63%	-89%	\$0.07
Analytica	ALT	21	A medical devices company that has developed a retractable syringe	245%	331%	\$0.07
Antisense Therapeutics	ANP	20	Developing antisense compounds to treat multiple sclerosis and acromegaly.	-34%	-17%	\$0.04
Scigen	SIE	19	Developer and manufacturer of biopharmaceuticals. Company is based in Singapore and was spun out of Sonic Healthcare in 2002.	-48%	-62%	\$0.04
Bone Medical	BNE	19	Developing treatments for bone and joint degenerative diseases such as arthritis and osteoporosis.	-30%	-49%	\$0.20
Brain Resource Corp	BRC	18	Development and commercialisation of functional brain analysis techniques.	-47%	-56%	\$0.20
Genetic Technologies	GTG	18	Provides DNA paternity testing services and holds broad patents relating to the use of non-coding DNA.	-28%	-67%	\$0.05
Compumedics	CMP	18	Develops, manufactures and markets sleep diagnostic and monitoring equipment.	-17%	-19%	\$0.13
USCOM	UCM	17	Marketing a non-invasive heart output function monitor.	21%	67%	\$0.44
Cyclopharm	CYC	17	A nuclear medicine company that markets the Technegas lung imaging system	-23%	-57%	\$0.10
Patrys	PAB	16	Developing human antibody therapies for the treatment of lung, pancreatic, gastric and colon cancers	-56%	-79%	\$0.10
Eastland Medical Systems	EMS	16	Developing retractable syringes, ClipOn and VetLock, and anti-malarial product ArTiMist.	-39%	-54%	\$0.08
Somnomed	SOM	15	Commercialising an oral device for the treatment of sleep apnea and snoring.	-5%	0%	\$0.02
Cytopia	CYT	15	Small molecule drug development company with a focus on kinase targets. Lead program, CYT997 is at the Phase II level of development.	13%	-66%	\$0.18
Acuvax	ACU	15	A developer of various cancer therapeutics. Formerly Avantogen.	-50%	-59%	\$0.03
Atcor Medical	ACG	15	Markets the SphygmoCor device, a noninvasive technology that provides information regarding the functioning of the cardiovascular system	50%	63%	\$0.15
QRxPharma	QRX	15	Developing a 'dual opioid' drug to treat moderate to severe pain.	-67%	-82%	\$0.20
ITL	ITD	14	Develops and distributes medical devices such as safety equipment to prevent needle stick injuries and sterile preparation kits.	10%	-52%	\$0.11
Halcygen	HGN	14	Developing an improved dosing anti-fungal drug, Subazole, based on drug delivery technology developed by Mayne Pharma.	-36%	-55%	\$0.19
Sunshine Heart	SHC	13	Developing the C-Pulse heart assist device. The C-Pulse wraps around and compresses the aorta, increasing blood flow through the body.	-57%	-71%	\$0.04
Biotron	BIT	13	Developing a compound to treat HCV	-14%	-33%	\$0.12
Labtech Systems	LBT	12	Developing the MicroStreak technology for the automation of microbiology laboratory processing	-19%	-40%	\$0.13

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/08
Advanced Surgical Design & Manufacture	AMT	12	A developer and manufacturer of prosthetic implants and medical devices	-3%	-62%	\$0.35
Genera Biosystems	GBI	12	Develops, manufactures and distributes advanced molecular diagnostic tests, with a particular focus on women's health.	33%	0%	\$0.24
Imugene	IMU	12	Developing animal products such as antibiotic alternatives used in the stock feed industry using a vaccine and gene therapy approach	39%	-43%	\$0.09
Medical Developments	MVP	12	Commercialising the Penthrax inhaler for temporary pain relief. Used widely in ambulances across Australia.	-5%	-50%	\$0.21
Viralytics	VLA	12	Developing a cancer treatment based on the application of viruses (oncolytic virus technology).	-23%	-52%	\$0.04
Benitec	BLT	11	R&D company focusing on gene silencing, specifically DNA delivered RNAi, technology.	-21%	-63%	\$0.04
Cogstate	CGS	11	Marketing cognitive performance diagnostic products.	0%	23%	\$0.16
Occupational & Medical Innovations	OMI	10	Developing safety devices used in the healthcare industry, including safety syringes.	0%	-55%	\$0.25
Austofix	AYX	9	Manufacturer and developer of orthopaedic fixation devices	0%	0%	\$0.85
Metabolic Pharmaceuticals	MBP	8	Holds a 60% stake in PolyNovo	-19%	-37%	\$0.03
Tyrian Diagnostics	TDX	7	Formerly Proteome Systems. Developer of diagnostic products.	-57%	-85%	\$0.03
Atos Wellness	ATW	7	Manages wellness centres in Singapore, Malaysia, India, Australia, Austria and Germany	0%	-25%	\$0.04
BioProspect	BPO	7	Developing insecticides from naturally occurring molecules	-21%	-63%	\$0.02
Agenix	AGX	7	Currently suspended from trading. Acquiring drug development business in China. Also developing Thrombview, a blood clot diagnostic imaging agent.	0%	-90%	\$0.02
Ellex Medical Lasers	ELX	7	Develops, manufactures and markets solid state ophthalmic lasers used to treat secondary cataracts and retinal disorders.	-60%	-88%	\$0.10
Optiscan Imaging	OIL	7	Manufacture of confocal microscopes for clinical diagnosis	-68%	-82%	\$0.06
Phylogica	PYC	7	Developing phylomer (protein fragment shapes) compound libraries for use in human therapeutics.	-62%	-78%	\$0.04
Life Therapeutics	LFE	6	A US based company operating a plasma collection business and marketing diagnostic tests for blood-borne diseases and blood-clotting disorders.	-9%	-83%	\$0.05
Medic Vision	MVH	5	Marketing training software and hardware for surgeons (formerly Premier Bionics)	-20%	-57%	\$0.06
Biodiem	BDM	5	Focused on the development of LAIV influenza vaccines	-36%	-64%	\$0.07
Healthlinx	HTX	5	Detecting novel functions of known and new protein and peptides for therapeutic purposes.	97%	-37%	\$0.06
Stem Cell Sciences	STC	5	Contract research and development and sale of re-agents for use in stem cell therapy research	-41%	-76%	\$0.15
KarmelSonix	KSX	4	Respiratory and pulmonary devices company. Acquired technologies from PulmoSonix and Karmel Medical Acoustics Technologies.	-46%	-92%	\$0.01

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/08
BioMD	BOD	4	Developing a tissue engineering technology, termed ADAPT	-44%	-50%	\$0.05
Tissue Therapies	TIS	4	Commercialising growth factors for spray-on skin product, other wound healing and in research and industrial cell growth applications.	12%	-73%	\$0.10
Imuron	IMC	4	Formerly Anadis. Specialises in R&D of hyper-immune bovine colostrum products for therapeutic use in animals and humans.	-57%	-70%	\$0.03
Medical Therapies	MTY	4	Developing therapies to treat inflammatory diseases, using copper- and zinc- indomethacin.	-31%	-60%	\$0.04
Giaconda	GIA	4	Developed novel (patented) combinations of registered drugs for the treatment of gastrointestinal disorders.	-62%	-86%	\$0.06
Virax Holdings	VHL	4	Developing a therapeutic and prophylactic vaccine for HIV.	-15%	-65%	\$0.03
Cryosite	CTE	4	Provides specialised storage services, especially for umbilical cord blood	-35%	-53%	\$0.08
PharmAust	PAA	4	Operates Epichem and PharmAust Manufacturing, which provide products and services to biotech and pharma companies	10%	-48%	\$0.02
Resonance Health	RHT	4	Marketing the FerriScan technology, a non-invasive tool for measuring liver iron levels	-23%	-33%	\$0.01
Avita Medical	AVH	3	Avita Medical is the new name for the merged entity that combines Clinical Cell Culture and Visiomed. A 10:1 capital reconstruction occurred on June 10, 2008.	-35%	33%	\$0.04
Advanced Ocular Systems	AOS	3	Merging with construction services company International Formwork and Scaffolding; divesting eyecare assets	20%	-81%	\$0.01
Anteo Diagnostics	ADO	3	Formerly Biolayer. Developer of a biological coatings technology that can be applied to immunoassays, bio-separations, drug delivery and other medical devices.	-32%	-62%	\$0.02
Medigard	MGZ	3	Developed retractable syringe technology and other safety medical products.	-36%	-55%	\$0.05
NeuroDiscovery	NDL	3	Provides electrophysiology services to biotech and pharma, and is developing range of compounds for treating neuropathic pain.	-44%	-58%	\$0.05
Freedom Eye	FYI	3	Formerly Solbec Pharmaceuticals. Acquiring Asian eyecare businesses, of which the first is Vista Vision in Malaysia	-23%	-71%	\$0.01
Colltech	CAU	3	Has developed a novel technology for the extraction of collagen from sheepskins.	-33%	-71%	\$0.01
OBJ	OBJ	3	Developing transdermal drug delivery technologies	-50%	-86%	\$0.01
Narhex Life Sciences	NLS	3	Currently suspended from trading. Developed a low cost protease inhibitor for treatment of HIV in Chinese market.	0%	-60%	\$0.02
Neuren Pharmaceuticals	NEU	3	Developing neuroprotective therapeutics	-86%	-94%	\$0.01
IM Medical	IMI	3	Markets the Intelliheart Cardiovascular Diagnostic System	-67%	-93%	\$0.002
Vita Life Sciences	VSC	2	Development, manufacture and distribution of prescription and OTC medicines as well as complementary and alternative medicines, dietary supplements and health foods.	-67%	-64%	\$0.05
Telesso Technologies	TEO	2	Funding a trial of US company Vascular Pathways' guidewire assisted peripheral catheter, with view to acquisition.	-11%	-83%	\$0.04
Norwood Abbey	NAL	2	Developing needle-free and micro needle drug delivery technologies	-40%	-84%	\$0.01

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/08
NuSep	NSP	2	Manufacture and sale of protein separations technologies	-8%	-74%	\$0.05
Rockeby Biomed	RBY	2	Research, development and marketing of rapid testing technologies for infectious diseases in animals and humans.	-75%	-95%	\$0.00
Genesis Research & Development Corp.	GEN	2	Developing RNAi based therapeutics. Interests in agricultural biotechnologies.	-13%	-65%	\$0.07
Biopharmica	BPH	2	Managing cancer treatment and detection and bacterial DNA diagnostic projects. Portfolio investment approach.	-24%	-65%	\$0.03
Avastra Sleep Centres	AVS	2	Consolidating sleep disorder testing centres in the USA	-6%	-97%	\$0.02
Incitive	ICV	2	Development of compounds to treat cancers and auto-immune diseases.	0%	-63%	\$0.03
Actinogen	ACW	2	Early stage developer of antibiotics that show activity against MRSA and VRE bacteria	-43%	-82%	\$0.04
Dia-B Tech	DIA	2	Developing therapeutics and diagnostics in the area of diabetes.	-45%	-80%	\$0.01
Select Vaccines	SLT	2	Development and commercialisation of infectious diseases diagnostics, vaccines and therapeutics for hepatitis-related diseases	-33%	-76%	\$0.01
Prima Biomed	PRR	1	Developing the CVac immunotherapy.	-29%	-76%	\$0.01
Biosignal	BOS	1	Developing compounds that interrupt the colonisation of bacteria. Applications in the oil and gas industry and with contact lenses are being studied.	-68%	-94%	\$0.01
Probiomics	PCC	1	Evaluating business options. Owns a unique probiotic.	-58%	-88%	\$0.01
Stirling Products	STI	1	Commercialising a production animal growth promotant and meat finisher.	-84%	-92%	\$0.00
Helicon Group	HCG	0.4	Exploiting niche market opportunities for medical products in China and other Asian markets.	-83%	-93%	\$0.01
Capitalisation Total		3,553				

Listed Biotech Investment Funds

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/08
Biotech Capital	BTC	10	A Pooled Development Fund investing in unlisted Australian biotech companies and in public biotechs, including Alchemia, Starpharma, Neurodiscovery, Phylogica and Stem Cell Sciences.	-21%	-63%	\$0.12
Xceed Capital	XCD	5	Has invested in Polynovo, a developer of biodegradable polyurethane-based polymers. Also operates Boron Molecular, a chemistry services company	-15%	-67%	\$0.06
Genesis Biomedical	GBL	1	Venture capital company funding a sepsis project at UWA; increasing its exposure to mining activities	-42%	-71%	\$0.01
Capitalisation Total		15				

Capitalisation Total - All Indexs **32,283**

* Price change is from IPO offer price

Note. Three companies under administration have been removed from the sector tables: Apollo Life Sciences, Chemeq and Portland Orthopaedics Diversa, formerly Ambri, has been removed due its change in business. Brainz has been removed following the sale of it principle assets.

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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