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Companies covered: **GSS, IMM, LBT, Atomo Diagnostics, 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)	-35.8%
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 (May '11 - May '12)	-18.0%
Year 12 (May '12 - May '13)	3.1%
Year 13 (May '13 - May '14)	26.6%
Year 14 (May '14 - May '15)	23.0%
Year 15 (May '15 - May '16)	33.0%
Year 16 (May '16 - May '17)	16.8%
Year 17 (May '17 - May '18)	-7.1%
Year 18 (May '18 - May '19)	-2.3%
Year 19 (May '19 - Current)	14.2%
Cumulative Gain	791%
Av. Annual gain (19 yrs)	15.9%

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# Bioshares

6 April 2020  
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Delivering independent investment research to investors on Australian  
biotech, pharma and healthcare companies

## Quarterly Review

### Biotechs Lose 27% in March Quarter

The SARS-CoV-2 (coronavirus) pandemic severely impacted ASX-listed equities, including almost all ASX life science stocks in the March quarter.

The severity of the collapse in equity prices in the March quarter was reflected in the decline in the **ASX 300 Index**, which fell by 23.1% from its December quarter close.

The **Bioshares Index** declined by 27% in the March quarter, its biggest decline since the December quarter of 2008 (-26.1%) and the March quarter of 2008 (-29.5%), the foundation year of the Global Financial Crisis.

The **Bioshares Botanicals Index** fell by 34.6% over the quarter. The **Nasdaq Biotech Index** experienced a less steep fall of 10.4% in the March quarter.

In contrast, the **Bioshares Large Cap Index** finished the quarter ahead by 6.3%, although it overcame excessive volatility to arrive at that point.

CSL and Resmed increased by 8% and 13% respectively for the March quarter, offsetting declines by Blackmores (-14%), Cochlear (-17%) and Nanosonics (-12%).

During the quarter, CSL fell 21% from an a high of \$341 to a low \$271, but then went on to end the quarter at \$297. Resmed's shares peaked at \$26.51 during quarter, before falling to a low of \$20.04, then finishing at \$24.69. Resmed is a manufacturer of ventilation equipment, a product that is in high demand for the treatment of patients seriously ill with COVID-19 disease. The Commonwealth Government placed an order for 1,000 ventilators with Resmed.

Cochlear's share suffered the most of the five stocks in the Large Cap Index. The company's exposure to cochlear implant surgery falling into the category of elective surgery, meant that its share price suffered a 37% decline during the quarter, from an in-quarter peak of \$252 to an in-quarter low of \$159. The company's situation was perceived to be dire enough to warrant the initiation of an \$880 million capital raise, and an SPP to raise up to \$50 million. Hospitals have deferred elective surgery to free staff and facilities to treat COVID-19 patients. Cochlear also received an adverse appeal decision to a US patent infringement case during the quarter, which said it had factored in to its cash planning. (See *Bioshares* 834)

Continued over

### Index Performance by Quarter (Change from previous Qtr)

	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020
Bioshares Index	16.2%	20.9%	18.2%	-1.0%	-27.0%
Bioshares Large Cap Index	1.4%	12.0%	9.3%	15.4%	6.3%
Bioshares Botanicals Index	17.3%	2.6%	-14.4%	-42.9%	-34.6%
<b>Nasdaq Biotech Index</b>	<b>15.4%</b>	<b>-2.4%</b>	<b>-8.8%</b>	<b>21.1%</b>	<b>-10.4%</b>
ASX 300 Index	9.5%	7.2%	1.2%	0.0%	-23.1%

**Bioshares Index – Top 10 Outperformers – March Quarter**

Company	Code	Cap. \$m	Change - Quarter	Change - Year	Price 31/03/20
TBG Diagnostics	TDL	59	900.0%	575.0%	\$0.270
USCOM	UCM	35	108.3%	47.1%	\$0.250
Genetic Signatures	GSS	249	69.9%	59.1%	\$1.750
Biotron	BIT	62	69.2%	17.3%	\$0.088
Lifespot Health	LSH	4	58.8%	0.0%	\$0.054
Cellmid	CDY	30	45.5%	45.5%	\$0.320
Holista Colltech	HCT	26	39.2%	61.8%	\$0.110
Cryosite	CTE	3	35.8%	60.0%	\$0.072
Race Oncology	RAC	27	31.6%	187.4%	\$0.250
AFT Pharmaceuticals	AFP	388	28.7%	102.0%	\$3.990

Other ASX-listed life science companies announced capital raisings with the intention of supporting the companies through a period of below average cash flow as well as accessing capital while some appetite exists, ahead of potentially more stringent capital rationing in the future.

Somnomed, which operates in 28 countries, has embarked on an underwritten \$15.5 million rights issue. The restriction of dental clinics to performing essential services is the chief reason for the loss of future income. The company stated that it is "impossible to predict the length, the depth and the extent of this crisis."

Since the end of the quarter, Impedimed announced a \$24.9 million rights issue, quickly completing a \$10 million institutional component. And Osprey Medical announced a \$15.5 million rights issue.

**Capital Raisings**

A total of \$74 million was raised by ASX-listed small cap life science companies in the March quarter, significantly less than the \$547 million raised in the previous quarter, but higher than the March quarter of 2019 (\$36 million).

Imricor completed a \$20 million placement. Total Brain completed the second tranche of a \$14 million capital raising, bringing in \$5.9 million, and Adherium raised \$5.2 million through a rights issue. Two IPOs were completed, with Nyrada securing \$8.5 million and Little Green Pharma banking \$10 million.

**Outperformers**

Of the 121 stocks currently included in the Bioshares Index, only 14 posted positive gains for the March quarter, and almost a quarter recorded share price decline of 50% or more.

The top performing stock for the quarter was TBG Diagnostics (TDL), which locked in a 900% gain. The company holds a 46.65% interest in a Chinese molecular diagnostics company, TBG Xiamen, which had received a CE Mark approval on March 18 for its SARS-CoV-2 diagnostic kit.

However, on April 6 the company said the Chinese Government

had banned all SARS-CoV-2 diagnostic kits that had not received the required China medical product registration certification. The company intends to work to gain the certification for export.

USCOM (UCM) shares rose by 108% over the quarter. The company's non-invasive hemodynamic monitor, USCOM 1, which has been approved in China since 2004, was the beneficiary of Chinese Health and Medical Commission's endorsement of non-invasive hemodynamic monitoring in the treatment of severe coronavirus cases in adults and children. The company announced a material increase in orders in the five weeks up to February 10, 2020.

Molecular diagnostic company Genetic Signatures shares responded to its announcement that it had begun shipping test kits for the detection of SARS-CoV-2. The company submitted registration applications to the TGA (for ARTG listing) and the relevant EU authority, with a CE Mark clearance received on April 1. GSS shares increased by 70%, to close the quarter at \$1.75.

Biotron is the ASX's only dedicated developer of small molecule anti-viral inhibitors. The stock closed the quarter 69% higher on the back of its announcement that it would be testing its compounds for their ability to inhibit SARS-CoV-2. (see *Bioshares* 834) Positive results could see a rapid transformation in its share price. The company's lead compound BIT225 has already established a safety profile in several clinical studies and can be administered orally, unlike Gilead's remdesivir, which while promising, is an injected drug.

**Outlook**

The global economy, along with financial markets, is in a state of unprecedented turmoil. We expect current volatility to continue, and many 'left field' effects to occur, until SARS-CoV-2 infection rates have peaked in 'indicator' regions. In some regions, such as Italy and Australia, there are signs of diminishing levels of new daily infections, with social distancing and high rates of testing having a positive impact.

In the long term, the coronavirus pandemic can be expected to stimulate investment in medical product security (for vaccines, biologics, cell therapy and API manufacturing), telemedicine, rapid point-of-care diagnostic and other testing and surveillance capabilities, immune-based approaches to disease management, and anti-infective drug research and development.

We expect capital for biotech companies to remain difficult to access, which may result in an increase in M&A activity and more deals that are weighted towards higher upfronts in exchange for decreased royalty rates.

Clinical stage companies may face delays in initiating studies, and face challenges in completing those studies, especially where chronic disease indications are being studied, as a consequence of hospital and clinics diverting resources to pandemic management and instituting infection control policies.

**Bioshares**

**Capital Raisings by Australian-listed Biotech Companies Q1 2020**

Company	Code	Investment Manager or Investor	Type of Raising	Funds Raised (\$M)
Imricor	IMR	Moelis Australia Advisory	Placement	\$20.0
Total Brain	TTB	Bell Potter	Placement (T2)	\$5.9
Adherium	ADR		Rights Issue	\$5.2
ResApp Health	RAP	Ashanti Capital / Morgans Corporate	Placement	\$5.0
Zelira Therapeutics	ZLD	CPS Capital	Placement	\$4.6
Simavita	SVA		Placement	\$2.9
Resonance Health	RHT	Acuity Capital Investment Management	Controlled Placement	\$2.8
AnteoTech	ADO	Mahe Capital	Rights Issue	\$2.2
Sienna Diagnostics	SDX		Rights Issue	\$2.1
Respiri	RSH		Placement	\$2.0
Race Oncology	RAC	Merchant Opportunities Fund	Placement	\$1.8
Amplia Therapeutics	ATX		Placement	\$0.9
Lifespot Health	LSH		Placement	\$0.3
Dorsavi	DVL		SPP	\$0.2
Little Green Pharma	LGP		IPO (45 cps)	\$10.0
Nyrada	NYR		IPO (20 cps)	\$8.5
<b>Total raised in Q1 2020</b>				<b>\$74.3</b>
<b>Total raised YTD 2020</b>				<b>\$74.3</b>

**Selected Clinical Trial Developments - Q1 2020**

Company	Code	Product/Therapeutic	Event
Admedus	AHZ	ADAPT single piece aortic valve	Completed first implant of device. To enroll 15 pts, who will be followed for 6 months
Avita Medical	AVH	ReCell (pediatric scalds)	Commenced randomised, active comparator arm study in 210 pts
Botanix Pharmaceuticals	BOT	BTX1204 (synthetic cannabidiol) (acne)	Randomised, double blind, vehicle controlled study in 200 pts failed to meet the primary endpoint or secondary endpoints
Dimerix	DXB	DMX200 (diabetic kidney disease)	Dosed an additional 5 pts to bring total numbers in Phase II study to 45
Emvision	EMV	EMV brain scanner (stroke)	Commenced 30 pt clinical trial
Exopharm	EX1	PLEXOVAL (platelet derived exosomes)	Recruitment into Phase I trial to be delayed because of COVID-19 factors
GI Dynamics	GID	Endobarrier (sleeve implant) (Type 2 diabetes and obesity)	Enrolled 1st pt in 67 pt, controlled, double blind trial in the USA
Immutep	IMM	eftilagimod alpha (IMP321) (in combination with paclitaxel) (metastatic breast cancer)	Reported six month data for 227 patient Phase II study. Overall response rate (ORR) was 48.3%, compared to control arm of 38.4%.
Noxopharm	NOX	Veyonda (plus 177Lu-PSMA-617) (late stage prostate cancer)	Completed enrolment in open label single arm 56 pt study.
Opthea	OPT	OPT-302 (VEGFC,D inhibitor) (soluble receptor 'trap; molecule) Diabetic macular edema	Completed dosing in and all follow-up in Phase IIa trial; 153 pts
Medlab Clinical	MDC	Nanabis (CBD:THC) (advanced cancer pain) (oro-buccal spray)	Completed open label Phase I trial in 30 pts. Met primary ep for safety and tolerability. Breast or prostate cancer pts with bone mets showed significantly less morphine equivalent of dispensed opioid analgesics
Zelira Therapeutics	ZLD	ZTL-101 (cannabinoid extract) (sublingual) (insomnia)	Randomised, double blind, cross-over Phase IIb/IIa trial (23 pts completed) met primary ep for safety and tolerability. ZTL-101 showed a significant decrease in insomnia severity index.

## Diagnosics and Instrumentation

### **LBT Innovations Submits Second Module for FDA Clearance**

LBT Innovations (LBT: \$0.11) is in a growth business at this time of a global pandemic, as the need for more efficient diagnostic tests and processes becomes strikingly evident.

The company is commercialising an automated agar plate analysis instrument, called the APAS Independent, that reduces the time and need for trained microbiologists to assess the majority of bacterial culture plates that record no infections.

Last week LBT submitted its second module for FDA clearance, that being for the analysis of MRSA (golden staph) infections. So far LBT's automated analysis module has been approved in the US for assessing urine-based samples for bacterial infection, as well as having gained clearance for the APAS instrument itself from the FDA.

MRSA and urine samples account for between 50%-70% of all bacterial infection tests in the US. The current submission for the MRSA module was based on comparing results from the APAS instrument to assessments made by three microbiologists on 1500 patient samples.

For Europe and Australia, the company commenced a study last month to gain self-certification for its assessment module for the APAS instrument to also be used to assess samples for resistant strains to the antibiotic Vancomycin (VRE). Clearance for MRSA assessment has already been achieved.

The work involved in gaining clearance for individual modules, which is required for different agar plates used in different regions, is a hurdle for the company for market entry but will also act as a barrier for competitors.

*Bioshares* recommendation: **Speculative Hold Class B**

### **Genetic Signatures Receives Overnight Approval for SARS-CoV-2 Test**

Last week Genetic Signatures (GSS: \$1.85) received European approval, the day after filing, for its SARS-CoV-2 test. The genetic test for infection of the virus uses the company's GS-1000 instrument, with each instrument having the capability to process 1,500 samples a day, with each batch of 188 samples able to deliver a result in four and a half hours.

The company has already shipped tests to Europe with sales discussions underway in Germany, the UK and Spain. The company's share price has gone up 68% this month.

*Bioshares* recommendation: **Take Profits**

### **Atomo Diagnostics to List this Month with SARS-CoV-2 Rapid Test**

Atomo Diagnostics issued a prospectus last month to raise funds through an IPO to support the commercialisation its rapid diagnostic test platform. (see *Bioshares* 833 for our IPO profile) However, the company has had to issue a supplementary prospectus to reflect an uptake in commercial interest in its hardware for rapid SARS-CoV-2 testing.

Atomo has developed the only HIV self-test to be approved in Australia, using a lateral flow blood test. In HIV, the company has shown that its test can achieve greater than 99% accuracy.

The company has needed to issue a supplementary prospectus due to changing commercial conditions – in recent weeks the company has been approached by diagnostic companies in the US, China and Europe that have developed rapid, blood-based tests for SARS-CoV-2 infection and are seeking to use Atomo's lateral flow hardware to deliver the test.

Atomo has 300,000 of its units in stock. It has progressed to negotiations with two potential customers and will rapidly expand its manufacturing once a commercial deal is secured for SARS-CoV-2 infection.

What differentiates the company's test platform is the accuracy and ease of use as an at-home test.

Atomo has multiple distribution arrangements in place for its HIV self-test. This includes with Mylan which has rights to the test in 100 countries across Central and South America, Africa and Asia. Iyeza has rights to sell the HIV test in parts of Africa. Owen Mumford has European rights.

Atomo is seeking to raise \$30 million at \$0.20 a share with a listing set for 23 April. The offer has now closed.

**Bioshares**

## **Immutep Phase IIb Breast Cancer Study Misses Primary Endpoint**

Immutep (IMM: \$0.125) has seen its share price fall by 58% following release of results from its Phase IIb breast cancer study with its immunotherapy treatment, IMP321.

The study involved 226 women with metastatic breast cancer. It was a blinded study comparing standard-of-care treatment, paclitaxel, to a combination of IMP321 with paclitaxel.

The results showed that the overall response rate (ORR) achieved was 48.3%, which was a small improvement over the control arm of 38.4%. According to the company, impeding the clarity of the treatment effect was a higher than expected control arm result, which historically has seen an ORR of just 20%-30%.

### **Sub-group Results**

However, it was not a homogeneous population, with better results achieved in certain subgroups. This includes in patients with more aggressive tumour subtypes (luminal B, around 50% of patients) where a p-value of 0.058 was achieved. There is likely to be less of a separation in efficacy against the control arm where patients have a more dormant cancer (luminal A).

Another subgroup was in patients with a compromised innate immunity (low monocyte levels, around 20% of patients). In this subgroup, the p-value was 0.084, which whilst still not statistically significant, noting the trial was not powered to assess benefit in subgroups, was clearly better than the result from the total population ( $p=0.341$ ).

### **Dosing Frequency**

Another aspect of the study that deserves consideration is the drop off in response rates after the six month treatment when paclitaxel ceased and treatment frequency with IMP321 was halved in patients responding to treatment. Potentially more frequent continued dosing of IMP321 (after six months) may have maintained a longer separation of efficacy curves between the control arm and the combination treatment group.

It should be noted that Immutep has multiple products under developed, both internally and externally, and multiple trials underway with IMP321. Whilst the outcome from this trial was disappointing, there have been some positive outcomes in patient subgroups.

However the ambiguous results mean that additional trials will likely be needed to gain marketing approval, and there may be less confidence in moving this program into a pivotal study based on the current data. Immutep was hopeful that a clear positive result could position the company to file the therapy for regulatory approval.

It should also be noted that while there is some level of benefit observed from this study, positive outcomes have been observed in multiple cancer indications so far with IMP321, including in metastatic melanoma, non-small cell lung cancer, and head and neck cancer.

Trials are also underway by partners, including GlaxoSmithKline with a Phase II study in ulcerative colitis (GSK781), five trials are

underway by Novartis (with LAG525) and a Phase I trial has been completed enrolment by EOC Pharma in China. Immutep is also conducting a combination study with a PD-L1 inhibitor (avelumab) from Pfizer and Merck KGaA in patients with solid tumours.

### **Summary**

Immutep finished last year with \$20.5 million in funds. Additional funding is expected to be received from milestone payments from partners, and from exercise of outstanding options. The company is capitalised at \$48 million.

*Bioshares* recommendation: **Speculative Hold Class A**

**Bioshares**

**Bioshares Model Portfolio (6 April 2020)**

Company	Code	Price (current)	Price added to portfolio	Recommendation	Cap'n (\$M)	Date added
Opthea	OPT	\$2.030	\$0.160	Spec Hold A	\$546	November 2014
Telix Pharmaceuticals	TLX	\$1.220	\$0.910	Spec Hold A	\$309	May 2019
Volpara Health Technologies	VHT	\$1.165	\$0.375	Spec Hold A	\$254	June 2017
Cyclopharm	CYC	\$1.200	\$1.35	Spec Buy A	\$94	September 2019
Somnomed	SOM	\$0.910	\$0.94	Spec Hold B	\$57	January 2011
Cogstate	CGS	\$0.330	\$0.24	Spec Hold A	\$54	April 2019
Immutep	IMM	\$0.125	\$0.320	Spec Hold A	\$48	March 2019
Pharmaxis	PXS	\$0.100	\$0.260	Spec Hold A	\$39	December 2016
Micro-X	MX1	\$0.125	\$0.38	Spec Buy A	\$31	May 2017
Dimerix	DXB	\$0.150	\$0.09	Spec Hold A	\$24	December 2018
Acrux	ACR	\$0.120	\$0.31	Spec Hold A	\$20	July 2017
Rhinomed	RNO	\$0.079	\$0.24	Spec Hold B	\$13	Jun-19

**Portfolio Changes – 6 April, 2020**

**IN:**  
No changes

**OUT:**  
No changes

**Stocks Removed from Bioshares Portfolio in TTM**

Date removed	Stock
September 2019	1AD, ALC, BCT
June 2019	CUV
March 2019	CGS, CYP, MGZ

## **The ASX-Listed Life Sciences Sector**

**March 31, 2020: Capitalisation \$197 billion, 145 companies**

### Bioshares Large Cap. Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/03/20
CSL	CSL	134,659	Manufactures pharmaceutical products including vaccines and human plasma fractions	8%	52%	\$296.68
Resmed Inc.	RMD	35,497	Manufactures diagnostic and treatment equipment for sleeping disordered breathing	13%	71%	\$24.69
Cochlear	COH	10,840	Manufactures cochlear hearing implants	-17%	8%	\$187.45
Nanosonics	NAN	1,683	Developing a novel disinfection technology, the first product is a point of care ultrasound probe disinfection unit, branded Trophon EPR	-11.8%	28.4%	\$5.600
Blackmores	BKL	1,269	Manufactures vitamin, mineral and herbal supplements and skin & hair products in Australia and N.Z.	-14%	-22%	\$72.95

**Capitalisation Total**                      183,948

### Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/03/20
Avita Medical	AVH	1,080	Markets ReCell, a skin repair product	-20.9%	78.9%	\$0.510
Polynovo	PNV	1,061	Developing novel polymer-based products for treating wounds and burns	-18.5%	114.0%	\$1.605
Clinuvel Pharmaceuticals	CUV	944	Markets an analogue of the alpha-MSH protein, named Scenesse, as a photo-protective agent. Approved in Europe.	-32.8%	-22.0%	\$19.110
Mesoblast	MSB	743	Developing cellular medicines to treat advanced heart failure, chronic low back pain and acute graft versus host disease.	-33.4%	-3.5%	\$1.385
Sigma Pharmaceuticals	SIG	678	Pharmaceutical manufacturing and wholesaling	10.3%	21.9%	\$0.640
API	API	616	Pharmaceutical wholesaler	-6.7%	-17.5%	\$1.250
Opthea	OPT	528	Developing OPT-302 to treat wet AMD (an eye disease)	-34.2%	186.1%	\$1.960
Mayne Pharma Group	MYX	494	Manufactures, develops and markets generic drugs, with operations in Australia and the USA	-29%	-55%	\$0.310
AFT Pharmaceuticals	AFP	388	Development and sale of pharmaceuticals in Australasia and Rest-of-World	28.7%	102.0%	\$3.990
Medical Developments	MVP	349	Commercialising the Pentrox inhaler for temporary pain relief. Used widely in ambulances across Australia.	-39.2%	6.8%	\$5.320
Clovercorp	CLV	323	Development and production of omega-3 food additives from tuna oil	-28.1%	-6.3%	\$1.940
Paradigm Biopharm.	PAR	314	Development of existing approved drug, pentosan polysulphate sodium to treat bone marrow oedema and joint pain	-45.6%	-15.4%	\$1.595
Starpharma Holdings	SPL	287	Developer of pharmaceutical chemical scaffolds known as 'dendrimers'	-36.4%	-19.4%	\$0.770
Telix Pharmaceuticals	TLX	252	Development of molecularly-targeted radiation (MTR) therapies and diagnostics	-35.8%	18.5%	\$0.995
Genetic Signatures	GSS	249	Development and sale of molecular diagnostics (MDx) kits and products.	69.9%	59.1%	\$1.750

## Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/03/20
Volpara Health Technologies	VHT	234	Markets breast density assessment tools and analytics, for use with breast X-ray screening programs	-41.5%	-23.6%	\$1.070
Next Science	NXS	232	Commercialisation of anti-biofilm products	-31.6%	0.0%	\$1.285
PYC Therapeutics	PYC	176	Developing peptide compound libraries for use in human therapeutics. Formerly Phylogica.	-3.2%	140.0%	\$0.060
Probiotec	PBP	151	Manufacturer, marketer and distributor of a range of over the counter (OTC) pharmaceuticals, complementary medicines and speciality ingredients	2.0%	28.7%	\$2.020
ResApp Health	RAP	136	Developing digital healthcare solutions to diagnose and manage respiratory conditions	-20.4%	126.7%	\$0.195
Alcidion	ALC	129	Specialist health IT solution provider	-29.7%	100.0%	\$0.130
Medadvisor	MDR	109	Medication adherence software platform company. Completed a 7:1 share consolidation	23.6%	38.2%	\$0.445
Neuren Pharmaceuticals	NEU	100	Developing neuroprotective therapeutics	-60.1%	-14.7%	\$0.990
SDI	SDI	95	Manufacture & distribution of amalgam (fillings) & other dental materials and product R&D	-4.2%	5.3%	\$0.800
Mach 7 Technologies	M7T	95	Development and sales of an enterprise imaging management platform	-25.2%	181.1%	\$0.520
Imricor	IMR	89	Design, manufacture and sales of MRI-compatible products for cardiac ablation procedures to treat arrhythmias	-28.9%		\$0.850
Imugene	IMU	89	Developing a Her2 positive cancer vaccine technology. Acquiring an oncolytic virus technology, CF33, from the City of Hope Hospital	-37.5%	5.3%	\$0.020
Oncosil Medical	OSL	85	Developing Oncosil, a brachytherapy for pancreatic cancer and liver cancer	-20.6%	150.0%	\$0.135
Painchek	PCK	85	Commercialising a smartphone app which uses facial recognition technology to detect indications of pain. TGA cleared and CE Marked.	-56.8%	121.6%	\$0.082
Cyclopharm	CYC	78	A nuclear medicine company that markets the Technegas lung imaging system	-15.3%	-8.7%	\$1.000
Ellex Medical Lasers	ELX	75	Recently divested ophthalmic lasers business to Lumibird Broup, retaining focus on devices to treat glaucoma	-32.9%	-14.8%	\$0.520
Cynata Therapeutics	CYP	71	Stell cell technology company aiming to produce unlimited uniform, pharmaceutical grade MSCs from a single donor.	-33.7%	-44.4%	\$0.690
Somnomed	SOM	70	Markets oral devices for the treatment of sleep apnea and snoring.	-61.8%	-35.3%	\$1.120
Biotron	BIT	62	Developing a drug to treat HIV. Testing drug library against SARS-CoV-2	69.2%	17.3%	\$0.088
TBG Diagnostics	TDL	59	Development of HLA SSA and SBT diagnostic kits and related services	900.0%	575.0%	\$0.270
Compumedics	CMP	58	Develops, manufactures and markets sleep diagnostic and monitoring equipment.	-58.8%	-29.0%	\$0.330
Cogstate	CGS	56	Markets cognitive performance diagnostic products	-15.4%	43.5%	\$0.330
Immutep	IMM	51	Developing immuno-oncology drug candidates IMP761 and IMP321 (eftilagimod alpha)	-50.0%	-60.6%	\$0.130



## Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/03/20
Resonance Health	RHT	47	Markets FerriScan, a non-invasive tool for measuring liver iron levels	-51.1%	19.6%	\$0.110
Orthocell	OCC	46	Developing and marketing regenerative medicine products	-49.0%	78.6%	\$0.250
Respiri	RSH	41	Respiratory and pulmonary devices company. Markets Airsona, an ehealth product.	-22.9%	-7.5%	\$0.074
Invex Therapeutics	IXC	40	Developing a novel formulation of the diabetes drug exanatide to treat intracranial pressure and other indications	-15.1%		\$0.730
Star Combo Pharma	S66	39	Develops, manufactures and markets nutritional and OTC products	-7.2%	-22.4%	\$0.450
Bluechiip	BCT	39	Development, manufacture and commercialisation of a tracking system for biological samples	-58.1%	-26.1%	\$0.065
Osteopore	OSX	38	Manufacture of 3D bioresorbable implants. Three products are FDA cleared and CE Marked for cranio-facial indications	-47.9%	0.0%	\$0.380
Invion	IVX	38	Development of Photosoft, a photosensitiser derived from chlorophyll, which it is believed can accumulate selectively in tumours and be manipulated for therapeutic purposes.	-46.2%	-41.7%	\$0.007
Pharmaxis	PXS	36	Markets the lung function test, Aridol. Bronchitol is approved in Europe for the management of cystic fibrosis. Developing a suite of compounds from amine oxidase platform.	-42.5%	-65.3%	\$0.092
USCOM	UCM	35	Markets Uscom, a non-invasive heart output function monitor, BP+ non-invasive central blood pressure product and digital ultrasonic spirometry products	108.3%	47.1%	\$0.250
Vita Life Sciences	VLS	35	Development, manufacture and distribution of prescription and OTC medicines as well as complementary and alternative medicines, dietary supplements and health foods	-6.0%	-23.6%	\$0.630
Recce	RCE	35	Development of broad spectrum antibiotics	-27.8%	30.0%	\$0.260
Invitrocue	IVQ	35	Singapore-based analytical services company (life sciences)	0.0%	-20.0%	\$0.060
Total Brain	TTB	33	Development and commercialisation of functional brain analysis techniques. <b>Completed 10:1 share consolidation</b>	-58.3%	25.0%	\$0.350
Oventus	OVN	32	Developing an oral appliance to treat sleep apnea and snoring	-50.0%	-9.3%	\$0.245
Emvision	EMV	31	Exploiting low energy non-ionising microwave radiation to create 3D images, with the goal of developing a device to support the diagnosis of the two main types of stroke	-27.9%	37.7%	\$0.530
Cellmid	CDY	30	Develops and markets therapies and diagnostic tests for fibrotic diseases, cancer, ischemic diseases of the heart and hair loss.	45.5%	45.5%	\$0.320
Kazia Therapeutics	KZA	29	Developing GDC-084 for the treatment of glioblastoma multiform (a brain cancer)	-33.3%	-13.0%	\$0.400
BARD1 Life Sciences	BD1	29	Developing cancer diagnostics and therapies. Lead program is the BARD1 lung cancer test.	-38.2%	31.3%	\$0.021
Memphasys	MEM	28	Developing a sperm separation technology, SpermSep	-22.0%	69.6%	\$0.039
Universal Biosensors	UBI	28	Development, manufacture and commercialisation of a range of in vitro diagnostic tests for point-of-care use	-18.4%	-22.5%	\$0.155
Race Oncology	RAC	27	Completing the development of a chemotherapy drug, called Bisantrene, which was the subject of more than 40 phase II clinical studies during the 1980s and 1990s.	31.6%	187.4%	\$0.250

## Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/03/20
IDT Australia	IDT	27	Manufacturer of pharmaceutical ingredients to international standards for major pharmaceutical groups.	-17.9%	-23.3%	\$0.115
Admedus	AHZ	26	Application of proprietary ADAPT technology to treat tissue used in the manufacture of cardiovascular prostheses. <b>Completed 100:1 share consolidation</b>	-55.3%	6.4%	\$4.470
AnteoTech	ADO	26	Developer of a biological coatings technology that can be applied to immunoassays, bio-separations, drug delivery and other medical devices	-27.3%	-5.9%	\$0.016
Holista Colltech	HCT	26	Extracts collagen from sheepskins and markets natural healthcare products.	39.2%	61.8%	\$0.110
LBT Innovations	LBT	25	Developer of innovative products which deliver productivity benefits across a range of life science settings	-33.1%	40.8%	\$0.107
Micro-X	MX1	24	Development of a mobile medical x-ray imager for hospitals, a version for deployed military use and a mobile security back-scatter imager	-32.5%	-49.4%	\$0.135
Proteomics International	PIQ	23	Provider of protein chemistry analytical services. Seeking to commercialise a diabetic kidney disease diagnostic.	-7.4%	-16.7%	\$0.250
Actinogen Medical	ACW	22	Developing Xanamem for the treatment of dementia in Alzheimer's disease patients	-44.4%	-63.0%	\$0.020
Botanix Pharmaceuticals	BOT	22	Developing BTX1503 for the treatment of acne. BTX1503 combines synthetic cannabidiol with a transdermal drug delivery system, Permetrex.	-72.0%	-80.0%	\$0.023
Antisense Therapeutics	ANP	22	Developing antisense compounds to treat multiple sclerosis and Duchenne Muscular Dystrophy	-46.7%	26.3%	\$0.048
Dimerix	DXB	22	Developing a combination therapy, DMX200, to treat chronic kidney disease.	7.7%	62.8%	\$0.140
PharmAust	PAA	21	Developing a veterinary anti-parasitic compound (PPL-1) as a human and animal cancer therapy. Also operates Epicchem, a medicinal chemistry service business.	-36.4%	78.9%	\$0.068
Impedimed	IPD	20	Markets products that aid the diagnosis of secondary lymphoedema, muscle wasting and other disorders	-75.8%	-81.4%	\$0.040
Genetic Technologies	GTG	20	Markets cancer risk tests	0.0%	-37.5%	\$0.005
Regeneus	RGS	19	Commercialisation of autologous adipose derived stem cells and factors. Markets HiQCell for human use and CryoShot for veterinary use.	-19.5%	-36.4%	\$0.070
IMEXHS	IME	19	Markets a radiology and imaging platform, in Latin and South America, and uses SaaS and PaaS revenue models.	-44.7%		\$0.021
Bionomics	BNO	19	Discovery and development of drugs to treat CNS diseases	-56.4%	-72.8%	\$0.034
Noxopharm	NOX	19	Developing a cancer treatment, NOX66, a formulation of idronoxil, which targets NADH oxidase 2.	-50.0%	-65.0%	\$0.140
G Medical	GMV	18	Developing next generation mobile health and e-health devices, and cloud and medical call centres.	-46.4%	-83.6%	\$0.045
Acrux	ACR	18	Developer of topical generic drugs	-42.1%	-40.5%	\$0.110
Bio-Gene Technology	BGT	16	Commercialisation of the insecticides Flavocide (synthetic) and Qcide (plant-derived), in the fields of human health and crop protection	-30.0%	41.4%	\$0.140

## Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/03/20
TALI Digital	TD1	15	Software company developing tools for assessment and improvement of attention in children	-60.8%	0.0%	\$0.020
Allegra Orthopedics	AMT	15	A developer and manufacturer of prosthetic implants and medical devices.	-25.0%	25.0%	\$0.150
Heramed	HMD	15	Commercialising a home pregnancy monitoring technology	-9.4%	61.8%	\$0.145
Nyrada	NYR	14	Developing drugs to treat cardiovascular, neurological and chronic inflammatory diseases	-35.0%	0.0%	\$0.130
Alterity Therapeutics	ATH	14	Developing PBT434 for synucleinopathies	-20.0%	-63.6%	\$0.016
Patrys	PAB	14	Developing novel antibody therapies for a range of oncology indications. Focussed on 3E10, a cell penetrating antibody.	-35.0%	-45.8%	\$0.013
Exopharm	EX1	14	Development of technology for improving the purification of exosomes, which are extra-cellular vesicles which transport bioactive molecules through out the body.	-34.6%	-57.5%	\$0.170
Rhinomed	RNO	12	Developing nasal stent technologies with applications for sport performance, sleep and drug delivery	-65.2%	-62.6%	\$0.073
Vectus Biosystems	VBS	12	Developing an anti-fibrotic compound, VB0004, with applications in heart and kidney disease	-11.9%	15.6%	\$0.520
CardieX	CDX	12	Development of wearable blood pressure measurement devices	-42.9%	-57.9%	\$0.016
Immuron	IMC	11	Sales and development of hyper-immune bovine colostrum products for therapeutic use	-38.5%	-62.8%	\$0.080
Neuroscientific Biopharm.	NSB	11	Developing EmtinB, an LRP-1 receptor agonist for the treatment of Alzheimer's disease	0.0%	5.6%	\$0.190
Prescient Therapeutics	PTX	11	Developing compounds to treat various cancers	-54.1%	-44.0%	\$0.028
Asian American Medical Group	AJJ	10	Manages liver treatment centres in Asia; expanding into radiation oncology	-62.5%	-66.7%	\$0.030
Optiscan Imaging	OIL	10	Manufactures confocal microscopes for clinical diagnosis	-47.4%	-52.4%	\$0.020
Adalta	1AD	9	Developing AD-214 for the treatment of idiopathic pulmonary fibrosis (IPF) and other human fibrotic diseases	-52.2%	-76.6%	\$0.055
Anatara Life Sciences	ANR	8	Developing a gastrointestinal dietary supplement	-33.3%	-67.3%	\$0.160
Simavita	SVA	7	Commercialising an incontinence assessment technology.	-32.0%	0.0%	\$0.017
Analytica	ALT	7	Markets the Pericoach product to aid in the management of female urinary incontinence.	-33.3%	-50.0%	\$0.002
Suda Pharmaceuticals	SUD	7	Developing drugs for oro-mucosal administration. Recently acquired IP for anagrelide, with intent to develop it as an anti-cancer therap. Completed 25:1 consolidation.	-15.5%	-51.0%	\$0.049
Osprey Medical	OSP	6	Markets DYEVERT, a device which reduces the amount of dye needed in imaging procedures	-50.0%	-88.9%	\$0.015
Imagion Biosystems	IBX	6	Developing MagSense, a diagnostic technology which exploits the principles of superparamagnetic relaxometry	-52.0%	-52.0%	\$0.012
Medibio	MEB	6	Commercialising a test for depression and anxiety	-40.0%	-64.7%	\$0.006
Sienna Cancer Diagnostics	SDX	6	Development of pancreatic cancer diagnostic (with Minomic Int.) and an exosome based therapeutic to treat CLI (with VivaZome)	-42.1%	-66.7%	\$0.022

## Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/03/20
StemCell United	SCU	6	Applies a proprietary stem cell technology to culture and grow plant extracts for use in Traditional Chinese Medicine.	-35.7%	-55.0%	\$0.009
GI Dynamics	GID	5	Commercialising the Endobarrier, an implantable polymer liner for the management of obesity and diabetes	-82.4%	-85.7%	\$0.003
Rhythm Biosciences	RHY	5	Developing Colostat, a blood test for the early detection of colorectal cancer	-60.0%	-67.5%	\$0.052
Living Cell Technologies	LCT	5	Development of NTCELL for the treatment of Parkinson's Disease, and potentially for eye and ear diseases	-43.8%	-75.7%	\$0.009
Bioxyme	BXN	5	Sale and distribution of probiotics	-42.9%	-61.9%	\$0.008
Visioneering Technologies	VTI	5	Markets a next-generation contact lens	-76.9%	-82.6%	\$0.012
Adherium	ADR	5	Commercialising personal digital medication monitoring systems to improve patient compliance and medication efficacy	-53.6%	-53.6%	\$0.013
Lifespot Health	LSH	4	Commercialising the Bodytel diagnostic software, which is deployed with its Medihale medical cannabis vaporiser system, as well as with patients with metabolic syndrome	58.8%	0.0%	\$0.054
Medigard	MGZ	3	<b>SUSPENDED FROM TRADING</b>	0.0%	0.0%	\$0.020
Cryosite	CTE	3	Provides specialised storage services, especially for umbilical cord blood	35.8%	60.0%	\$0.072
Avecho Biotechnology	AVE	3	Commercialising a drug delivery system. Formerly Phosphagenics	-50.0%	-33.3%	\$0.002
Amplia Therapeutics	ATX	3	Developing drug candidates to treat fibrotic cancers and fibrosis. Formerly Innate Immunotherapeutics.	-13.4%	-58.6%	\$0.058
Jayex Healthcare	JHL	3	Commercialisation of the Enlighten patient workflow platform	-50.0%	-57.1%	\$0.015
Dorsavi	DVL	2	Commercialising a wireless sensor movement monitoring system and products for use in the Elite Sports, OH&S and medical/physiotherapy markets	-61.5%	-75.6%	\$0.010
Factor Therapeutics	FTT	2	Business under review following the failure of wound therapy VT001 to meet endpoints in Phase II trial	-33.3%	-33.3%	\$0.002
Neurotech International	NTI	1	Development and sales of Mente (and platform), a treatment for improving behaviours of people with autism and other neurological conditions	-68.8%	-68.8%	\$0.005

**Capitalisation Total**                      **12,232**

## Botanical Product Companies (Cultivated Production)

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/03/20
Cann Group	CAN	98	Medicinal cannabis company focused on the breeding, cultivation and production stages. Holds Australian ODC cultivation (MC) and research license (CR).	9.5%	-70.0%	\$0.690
Palla Pharma	PAL	69	Licensed poppy producer. Narcotic raw material processor. Holds Australian ODC cultivation (MC) and research license (CR). Formerly TPI Enterprises.	-47.9%	-54.2%	\$0.550
Althea Group	AGH	63	Supply of branded medicinal cannabis products in Australia. To cultivate, extract and manufacture medicinal cannabis. Holds ODC manufacturing license.	-28.0%	-25.0%	\$0.270

**Botanical Product Companies (Cultivated Production)**

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/03/20
Auscann Group Holdings	AC8	60	Developing medical cannabis products for the Australian market. Holds Australian ODC cultivation (MC) and manufacture license and TGA manufacture license.	-29.6%	-48.6%	\$0.190
Medlab Clinical	MDC	44	Development, production and marketing of nutraceuticals. Also developing cannabis product to treat cancer patients with intractable pain.	-37.7%	-48.6%	\$0.190
Elixinol Global	EXL	41	A supplier of hemp and medicinal cannabis products	-47.8%	-93.5%	\$0.295
Little Green Pharna	LGP	40	Sale and distribution of medicinal cannabis products	-33.3%		\$0.300
THC Global Group	THC	30	A medicinal cannabis company formed through the acquisition of Canndeo, an off-shoot of Agri Fibre Industries. Holds Australian ODC cultivation (MC) and research license (CR).	-43.4%	-62.3%	\$0.215
Zelira Therapeutics	ZLD	26	Merged with Ilera Therapeutics. Formerly Zelda Therapeutics	-38.2%	-35.8%	\$0.034
IM Health	IHL	25	Seeking to obtain Commonwealth and state licenses to import, store, distribute and export medicinal cannabis, while diversifying from its dental products business	-41.9%	50.0%	\$0.036
MGC Pharmaceuticals	MXC	23	A medical and cosmetic cannabis company with growing operations in Slovenia. Acquired Czech company Panax Pharma. <b>SUSPENDED FROM TRADING</b>	-46.9%	-51.4%	\$0.017
Bod Australia	BDA	18	Developer and distributor of natural, evidence-based cosmetics and natural medicines. Holds medicinal cannabis import license. Overseas partner is Linnea SA.	-35.0%	-47.3%	\$0.195
Cann Global	CGB	14	Operates a hemp seeds business and conducts medical cannabis research	-50.0%	-81.1%	\$0.007
Creso Pharma	CPH	10	Development of cannabis and hemp derived therapeutic, nutraceutical, and life style products with wide patient and consumer reach for human and animal health.	-52.8%	-83.6%	\$0.059
Affinity Energy and Health	AEB	9	Investor in Uruguayan company Biogenics. Has applied to the Australian ODC to cultivate and produce medicinal cannabis. <b>SUSPENDED FROM TRADING</b>	0.0%	0.0%	\$0.009
CannPal Animal Therap.	CP1	8	Research and development of cannabis-based therapeutics for companion animals	-31.7%	-31.7%	\$0.082
Fiji Kava	FIJ	3	Cultivation and development of kava (piper methysticum) as an alternative treatment for anxiety, pain and insomnia.	-37.3%	-41.3%	\$0.047
eSense Health	ESE	1	Specialises in phytochemical profiling of plants to develop and reverse engineer terpenes for medical and other applications.	-61.5%	-78.3%	\$0.005

**Capitalisation Total**                      **582**

**Listed Biotech Investment Funds or Companies**

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/19
BTC Health	BTC	20	Provides capital and management expertise to high-growth Australian biotech, medtech and pharmaceutical companies	-36%	-30%	\$0.080

**Capitalisation Total**                      **20**

**Capitalisation Total - All Indices**                      **196,782**

**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 Some 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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