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Companies covered: **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 - May '20)	39.5%
Year 20 (May '20 - Current)	83.5%
Cumulative Gain	1898%
Av. Annual gain (20 yrs)	20.6%

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Bioshares

6 January 2021
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Delivering independent investment research to investors on Australian biotech, pharma and healthcare companies

Quarterly Review

Biotech Stocks Hold Steady in Dec Quarter

The **Bioshares Index** eased 0.6% in the December quarter, digesting gains in the previous two quarters. The **Bioshares Large Cap Index** posted a modest 2.4% increase for the quarter. These indices were adjusted, with Blackmores (Cap'n: \$1.4 billion) being moved from the Large Cap Index, being replaced by Polynovo (Cap'n: \$2.6 billion).

The **Bioshares Botanical Index** surged 41% in the December quarter, inspired by the easing of regulations for cannabis substances. However, its aggregate capitalisation of \$1.4 billion across 18 companies was still below a high in Q1 2018 of \$1.7 billion.

The Nasdaq Biotech Index, a bellwether index for biotech investors, gained a solid 11.8% over the December quarter, after holding steady in the previous quarter.

What was notable about the December quarter was that it was the strongest quarter for the year for capital raisings, with \$634 million in funds raised, slightly above the \$605 million raised in the June quarter. Two IPOs (Nutritional Growth Solutions and Control Bionics) and one PO (Hexima) accounted for \$25 million in funds raised.

December quarter capital raisings were driven less by the demand for buffer capital sought by companies in the June quarter, and more by surging share prices, providing biotech companies with an incentive to access capital. The top line measure of the Bioshares Index's performance was significantly affected by Mesoblast's 56% slump for the quarter. When adjusted for this specific decrease, the Bioshares Index increased by 8.7% for the quarter, thus showing a stronger underlying growth in prices.

All up, \$1.7 billion was raised over CY2020, compared to \$1 billion in CY2019 and \$751 billion in CY2018.

New listings in the pipeline include Chimeric Therapeutics, EZZ Life Science Holdings and Singular Health. Other possible listings in 2021 include Eyetelligence, Firebrick Pharma and BCAL Diagnostics.

Bioshares

Index Performance by Quarter (Change from previous Qtr)

	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020
Bioshares Index	-1.0%	-27.0%	36.7%	15.3%	-0.6%
Bioshares Large Cap Index	15.4%	6.3%	0.2%	-2.9%	2.4%
Bioshares Botanicals Index	-42.9%	-34.6%	12.9%	-7.3%	40.6%
Nasdaq Biotech Index	21.1%	-10.4%	26.7%	-0.9%	11.8%
ASX 300 Index	0.7%	-23.7%	14.6%	-1.5%	12.1%

Note: PNV added to, BKL removed from Large Cap Index

Publication Schedule – January

Bioshares 876 will be emailed in the week beginning January 24, 2021. *Bioshares* is published 48 times a year.

Bioshares Index – Top 10 Outperformers – Dec Quarter

Company	Code	Cap. \$m	Change - Quarter	Change - Year	Price 31/12/20
Rhythm Biosciences	RHY	176	264.6%	573.1%	\$0.875
Avecho Biotechnology	AVE	46	262.5%	625.0%	\$0.029
Neurotech International	NTI	25	246.2%	181.3%	\$0.045
Allegra Orthopaedics	AMT	37	133.3%	75.0%	\$0.350
Telix Pharmaceuticals	TLX	1,060	127.7%	143.9%	\$3.780
Race Oncology	RAC	227	122.9%	821.1%	\$1.750
Asian American Med. Grp	AJJ	22	116.7%	-18.8%	\$0.065
Imugene	IMU	474	112.8%	212.5%	\$0.100
Imagion Biosystems	IBX	145	85.9%	480.0%	\$0.145
Impedimed	IPD	135	83.8%	-24.2%	\$0.125

Outperformers

Rhythm Biosciences headed the leader board for top performers in the December quarter with a 265% increase. The company reported the performance for an new version of its colorectal cancer screening test ColoSTAT, while at the same time experiencing COVID-19 related challenges with recruitment for its most important program, a >1,000 patient clinical trial, which is now scheduled to be completed in mid 2022. Without meaningful clinical trial progress, the stock is likely to weaken in 2021.

Avecho Biotechnology performed strongly off a low base (up 263%) and low capitalisation (now \$46 million). The former Phosphagenics initiated a cannabis drug development program, aiming to apply its alpha-tocopherol technology (TPM) to improve the bioavailability of cannabinoids, reporting data that showed its TPM formulations could increase drug pharmacokinetics up to ~40 times. Alpha-tocopherol (Vitamin E) is a lipid-soluble molecule.

Neurotech International (+246%) is another company taking a new direction in the area of medicinal cannabis. It has been assessing selected cannabis strains for their anti-inflammatory and neuro-modulatory properties, and is planning on commencing clinical studies in Q1 2021.

Allegra Orthopaedics' share price recovery (+133%) was likely aided by positive results from the mechanical stress testing of a new spinal cage device.

There were multiple factors at play in lifting **Telix Pharmaceuticals'** share price 128% higher for the quarter, including the signing of a license and partnership with China Grand Pharmaceuticals for the greater China market, and the receipt of FDA advice for its Phase III prostate cancer study of TLX591, amongst others. The China deal saw CGP make a US\$25 million equity investment alongside a US\$25 million upfront payment. While the breadth of programs in Telix brings diversification, it also means the company will have challenges to reach all of its milestones in the medium term.

Race Oncology's share price increased 123% for the quarter, driven by data from studies completed at the University of Newcastle, suggesting competitive advantages for bistantrone over doxorubicin and epirubicin.

Bioshares Index – Bottom 10 Underperformers – Dec Quarter

Company	Code	Cap. \$m	Change - Quarter	Change - Year	Price 31/12/20
Mesoblast	MSB	1,322	-55.7%	8.2%	\$2.250
Respiri	RSH	94	-38.1%	35.4%	\$0.130
Alterity Therapeutics	ATH	27	-38.0%	55.0%	\$0.031
Cynata Therapeutics	CYP	95	-33.5%	-34.1%	\$0.685
Medibio	MEB	11	-33.3%	-20.0%	\$0.008
Opthea	OPT	648	-32.4%	-35.6%	\$1.920
Bluechiip	BCT	26	-31.3%	-71.6%	\$0.044
Avita Medical	AVH	530	-28.4%	-23.4%	\$4.940
Invex Therapeutics	IXC	48	-25.5%	-16.9%	\$0.715
Dimerix	DXB	46	-23.0%	80.8%	\$0.235

Underperformers

Mesoblast's share price was distinctively volatile in the second half of 2020, slumping 37% in August following the FDA's release of its review package for remestemcel-L for the treatment pediatric GvHD. This loss was recovered until the FDA placed a Clinical Hold on the application in October, precipitating another sell-off (-42%). The stock recovered again in November helped by a deal with Novartis. However, in December the company announced that its Phase III heart failure study did not meet its primary endpoint, and that its COVID-19 ARDS trial was being halted, as it was "not likely to meet the 30-day mortality reduction endpoint at the planned 300 patient enrolment." Mesoblast finished down 55.7% for quarter, and up 8.2% for the year.

Respiri's 38% quarterly decline followed a strong gain in the previous quarter of 136%, indicative of profit taking at work, and following a \$12.5 million capital raise. The company is developing a wheeze detection technology to aid in the management of asthma.

Alterity Therapeutics' share price was impacted by a \$35 million capital raising, with a lack of clinical news flow to offset the dilutive effect of the capital raise. A Phase II study of ATH434 is not expected to begin enrolling patients until H2 2021.

Cynata Therapeutics experienced a softer share price (-33.5%) on the back of a 69% increase the previous quarter. A recently completed \$15 million capital raise means the company is funded to expand its pipeline of opportunities for cell therapy products manufactured using its Cymerus technology. This is significant because it can deliver a consistent drug product, which is an issue for some other stem cell therapy approaches.

Medibio has been a troubled stock since late 2018, trading around the 0.1 cent mark throughout 2020. A diminished ability to access capital may mean the company could become a vehicle for new programs and investors in 2021.

Opthea's share price decline of 32.4% belies the company's significant progress made during the year. The company listed on the Nasdaq, raising \$181 million in the process. This was the largest of any capital raising by an Australian biotech in 2020. The company is funded to move ahead with the Phase III development of OPT-302.

Capital Raisings by ASX-listed Life Science Companies, Q4 2020

Company	Code	Investment Manager or Investor	Type of Raising	Funds Raised (\$M)
Opthea	OPT	Citigroup / SVB Leerink / Oppenheimer / Truist Securities	Placement	\$181.0
PYC Therapeutics	PYC		Rights Issue (Insto)	\$30.2
PYC Therapeutics	PYC		Rights Issue (Retail)	\$5.4
PYC Therapeutics	PYC		Placement	\$5.0
Telix Pharmaceuticals	TLX	China Grand Pharmaceutical and Healthcare Holdings	Placement (Investment)	\$35.4
Medavisor	MDR		Placement	\$23.5
Medavisor	MDR		Rights Issue (Insto)	\$11.5
Medavisor	MDR		Rights Issue (Retail)	\$3.2
Alterity Therapeutics	ATH	MST Financial	Placement	\$35.0
Imricor	IMR	Moelis Australia Advisory	Placement	\$28.5
Imricor	IMR		SPP	\$1.6
Immuron	IMM	Australian Ethical, Perennial Value Management, Regal Funds Management, Firetrail Investments, Ridgeback Capital Bell Potter / Taylor Collison	Placement	\$29.6
Medical Developments Int.	MVP	Bell Potter	Placement	\$25.0
Noxopharm	NOX	Canaccord Genuity	Placement	\$23.0
Elixinol Global	EXL	Bell Potter / MST Financial	Placement	\$8.2
Elixinol Global	EXL		SPP	\$12.3
Cynata	CYP	Bioscience Managers Translation Fund Number 1	Placement	\$15.0
Respiri	RSH	Blue Ocean Equities	Placement	\$12.5
Creso	CPH	EverBlu Capital	Placement	\$8.9
Antisense Therapeutics	ANP	Wilson Corporate Finance / Morgans	Placement	\$7.3
Antisense Therapeutics	ANP		SPP	\$1.2
IMEXHS	IME		Placement	\$8.3
Bod Australia	BDA	Bell Potter	Placement	\$8.0
Acintogen	ACW	Bell Potter	Placement	\$6.0
Acintogen	ACW		Rights Issue	\$1.36
Patrys	PAB	Lazarus Corp	Placement	\$2.5
Patrys	PAB		Rights Issue	\$4.8
Vectus Biosystems	VBS	Gleneagle Securities	Placement	\$7.0
Next Science	NXS	Lang Walker	Placement	\$2.0
Next Science	NXS		SPP	\$5.0
Acruz	ACR	Bioscience Managers Translation Fund Number 1	Placement (T1)	\$6.6
Althea Group	AGH		Placement	\$6.0
Imagion Biosystems	IXB	Evolution Capital Advisors	Placement	\$6.0
Proteomics International	PIQ	Euroz Hartleys	Placement	\$6.0
Exopharm	EX1	Canary Capital / Alto Capital	Placement (T2)	\$4.3
AnteoTech	ADO		Options Exercise	\$3.9
Cann Global	CGB		Placement	\$3.75
Anatara	ANR		Placement	\$1.67
Anatara	ANR		SPP	\$1.40
Adherium	ADR	Viburnum	Convertible Note	\$3.0
SUDA Pharmaceuticals	SUD		Placement	\$2.8
THC Global	THC		Placement	\$2.8
Tali Digital	TD1	Brand Capital International	Placement (Investment)	\$2.7
Neurotech International	NTI	Max Capital	Placement	\$2.5
Bionomics	BNO		Rights Issue (Retail)	\$2.2
Dorsavi	DVL		Rights Issue	\$2.2
Lifespot Health	LSH	MID Wealth Pty Ltd / Cannvalate Pty Ltd	Placement	\$1.68
Anteris Tech	AVR		Placement	\$1.1
Control Bionics	CBL	Morgans	IPO (60 cps)	\$15.0
Nutritional Growth Solutions	NGS	Baker Young	IPO (20 cps)	\$7.0
Hexima	HXL	Canaccord Genuity	PO (20 cps)	\$3.0
Total raised in Q4 2020				\$633.6
Total raised in Q3 2020				\$387.4
Total raised in Q2 2020				\$605.2
Total raised in Q1 2020				\$74.3
Total raised CY2020				\$1,700.5

Selected Clinical Trial Developments - Q4 2020

Company	Code	Product/Application	Event
Adalta	1AD	AD-214 (fibrosis)	Phase I safety study; 34 healthy volunteers treated at doses ranging from 0.01 mg/kg to 10 mg/kg
Amplia Therapeutics	ATX	AMP945 (FAK inhibitor) (fibrotic conditions)	Dosed first patient in an up-to-64 pt Phase I safety study
Avecho Biotechnology	AVE	oral cannabidiol (CBD) TPM formulation	Commenced participation in 3,000 pt observational study
Bionomics	BNO	BNC210 (tablet formulation) (PTSD)	Commenced 7 day PK study
Botanix Pharmaceuticals	BOT	BTX1801 (synthetic cannabidiol) (prevention of surgical site infections)	Completed Phase IIa study of two nasally applied formulations; 60 healthy volunteers; twice daily admin; results expected in early 2021
Cyclopharm	CYC	Technegas (lung imaging agent - structural ventilation)	Independent Data Monitoring Committee said Phase III trial had met the trial's primary endpoint, and that the trial could be concluded. (204 of 240 pts)
Emvision	EMV	EMVision device (stroke classification)	Met endpoint of pilot study in 30 patients, 21 ischaemic and 9 haemorrhagic stroke pts, with overall accuracy of between 93.3% and 96% respectively
Exopharm	EX1	Plexoval OS (naïve exosome)	Commenced 15 pt, Phase I trial; randomised, double blinded, placebo-controlled study; assessing safety and biological activity of Plexaris OS in wound healing following a skin punch biopsy in healthy volunteer adults
Heramed	HMD	Herabeat device (foetal heart rate monitor)	Joondaloo study confirmed accuracy of device, compared to hospital grade CTG machine, and confirmed ease of use and user satisfaction with 81 expectant mothers
Incannex	IHL	IHL-42X (10mg THC combined with 200mg mineral supplement (obstructive sleep apnoea)	Commenced randomised, double-blind, placebo-controlled, dose-ranging Phase IIb study; three dose levels
Immutep	IMM	eftilagimod alpha (IMP321) (in combination with paclitaxel) (metastatic breast cancer)	At 60% of events in 226 pt study, reported statistically significant survival benefit in pre-defined patient subgroup; +7.1 months for pts under 65, +9.4 months for patients with low monocyte counts
Imugene	IMU	PD1-Vaxx (IMU-201) (B-cell epitope and T-cell epitope construct) (PD-L1 expressing non-small cell lung cancer (NSCLC))	Completed enrollment in low dose cohort for Phase I study
Kazia Therapeutics	KZA	Cantrixil (TRX-E-002-1) (a benzopyran)(persistent or recurrent ovarian cancer)	25 pts; determined maximum tolerated dose to be 5 mg/kg
Medlab Clinical	MDC	Nanabis (CBD:THC) (advanced cancer pain) (oro-buccal spray)	Has recruited 668 of 2,000 pts in an observational study
Mesoblast	MSB	Revescor (allogeneic mesenchymal precursor stem cells - MPCs) (advanced chronic heart failure)	Did not meet primary endpoint for 566 pt Phase III trial (537 pts for final readout), which was time to recurrent non-fatal decompensated heart failure major adverse cardiac events (HF-MACE) that occur prior to the first terminal cardiac event (TCE)
Mesoblast	MSB	remestemcel-L (mesenchymal stromal cells) (ventilator-dependent patients with moderate to severe acute respiratory distress syndrome (ARDS) due to COVID-19 infection)	"DSMB reported that there were no safety concerns and noted that the trial is not likely to meet the 30-day mortality reduction endpoint at the planned 300 patient enrolment." 223 pts had been enrolled.
Orthocell	OCC	Celgro (collagen medical device) (nerve regeneration)	Reported completion of enrollment of 19 pts with 35 nerve repairs. Reported 24 month data for 10 pts (19 nerves) and function restored for 17 of 19 nerve repairs)
Paradigm Pharmaceuticals	PAR	pentosan polysulfate sodium (PPS) (Mucopolysaccharidosis type I)	Dosed first patient in open label, 10 pt Phase II trial
Telix Pharmaceuticals	TLX	TLX101 (¹³¹ I-IPA) (with external beam radiation therapy) (recurrent glioblastoma multiforme)	Reported on 8 pts from first dosing cohort in 44 pt Phase III study; "PFS of 4.2 months compared to typically 2-2.5 months in this second-line patient population"
Telix Pharmaceuticals	TLX	TLX250-CDx (⁸⁹ Zr-girentuximab) (renal cancer diagnostic imaging)	Completed enrollment in Phase I study in Japan (40 pts)

Bioshares Model Portfolio (6 January 2021)

Company	Code	Price (current)	Price added to portfolio	Recommendation	Cap'n (\$M)	Date added
Clinuvel Pharmaceuticals	CUV	\$21.23	\$20.31	Buy	\$1,049	November 2020
Opthea	OPT	\$2.030	\$0.160	Spec Buy A	\$685	November 2014
Cyclopharm	CYC	\$2.550	\$1.35	Spec Buy A	\$202	September 2019
Cogstate	CGS	\$1.080	\$0.24	Spec Buy A	\$184	April 2019
Immutep	IMM	\$0.405	\$0.320	Spec Buy A	\$197	March 2019
Micro-X	MX1	\$0.380	\$0.38	Spec Buy A	\$137	May 2017
Cynata Therapeutics	CYP	\$0.690	\$0.70	Spec Buy B	\$86	December 2020
Dimerix	DXB	\$0.235	\$0.09	Spec Buy A	\$46	December 2018
Pharmaxis	PXS	\$0.094	\$0.260	Spec Buy B	\$37	December 2016
Patrys	PAB	\$0.024	\$0.01	Spec Buy B	\$43	July 2020
Acrux	ACR	\$0.165	\$0.31	Spec Buy A	\$27	July 2017
Adalta	1AD	\$0.145	\$0.07	Spec Buy B	\$36	May 2020

Portfolio Changes – 6 January, 2021

IN:
No changes

OUT:
No changes

Stocks Removed from Bioshares Portfolio in TTM

Date removed	Stock
October 2020	RNO, SOM, VHT
August 2020	TLX

The ASX-Listed Life Sciences Sector

December 31, 2020: Capitalisation \$207.7 billion, 148 companies

Bioshares Large Cap. Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/20
CSL	CSL	128,840	Manufactures pharmaceutical products including vaccines and human plasma fractions	-1.3%	2.7%	\$283.18
Resmed Inc.	RMD	39,460	Manufactures diagnostic and treatment equipment for sleeping disordered breathing	14.0%	24.3%	\$27.23
Cochlear	COH	12,425	Manufactures cochlear hearing implants	-4.5%	-15.9%	\$189.00
Polynovo	PNV	2,565	Developing novel polymer-based products for treating wounds and burns	75.6%	97.0%	\$3.880
Nanosonics	NAN	2,417	Developing a novel disinfection technology, the first product is a point of care ultrasound probe disinfection unit, branded Trophon EPR	41.4%	26.5%	\$8.03

Capitalisation Total 185,708

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/20
Blackmores	BKL	1,461	Manufactures vitamin, mineral and herbal supplements and skin & hair products in Australia and N.Z.	19.8%	-10.9%	\$75.55
Mesoblast	MSB	1,322	Developing cellular medicines to treat advanced heart failure, chronic low back pain and acute graft versus host disease	-55.7%	8.2%	\$2.250
Clinuvel Pharmaceuticals	CUV	1,103	Markets an analogue of the alpha-MSH protein, named Scenesse, as a photo-protective agent	-4.2%	-21.5%	\$22.320
Telix Pharmaceuticals	TLX	1,060	Development of molecularly-targeted radiation (MTR) therapies and diagnostics	127.7%	143.9%	\$3.780
Sigma Pharmaceuticals	SIG	652	Pharmaceutical manufacturing and wholesaling	4.2%	6.0%	\$0.615
Opthea	OPT	648	Developing OPT-302 to treat wet AMD (an eye disease)	-32.4%	-35.6%	\$1.920
4D Medical	4DX	639	Commercialising a lung function imaging technology (XV) which uses existing x-ray imaging systems combined with image processing methods to image the lung in motion	42.9%		\$2.430
Starpharma Holdings	SPL	635	Developer of pharmaceutical chemical scaffolds known as 'dendrimers'	4.3%	29.3%	\$1.565
API	API	606	Pharmaceutical wholesaler	17.1%	-8.2%	\$1.230
Paradigm Biopharm.	PAR	576	Developing pentosan polysulphate sodium to treat bone marrow oedema, joint pain and mucopolysaccharidosis type I	-3.8%	-13.0%	\$2.550
Mayne Pharma Group	MYX	550	Manufactures, develops and markets generic drugs, with operations in Australia and the USA	-12%	-21%	\$0.345
AFT Pharmaceuticals	AFP	532	Development and sale of pharmaceuticals in Australasia and Rest-of-World	9.9%	64.2%	\$5.090
Avita Medical	AVH	530	Markets ReCell, a skin repair product. Redomiciled to the US. Now Nasdaq listed and trades as CDIs	-28.4%	-23.4%	\$4.940
Imugene	IMU	474	Developing two B-Cell cancer vaccines, HER-Vaxx and PD1-Vaxx, and an oncolytic virus technology, CF33	112.8%	212.5%	\$0.100

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/20
PYC Therapeutics	PYC	466	Developing VP-001 to treat retinitis pigmentosa	-8.1%	137.1%	\$0.147
Medical Developments	MVP	464	Commercialising the Pentrox inhaler for temporary pain relief. Used widely in ambulances across Australia.	26.5%	-23.7%	\$6.680
Volpara Health Technologies	VHT	360	Markets breast density assessment tools and analytics, for use with breast x-ray screening programs	10.0%	-21.6%	\$1.435
Aroa Biosurgery	ARX	346	Manufacture and sale of wound healing and soft tissue reconstruction products	-14.5%		\$1.150
Mach 7 Technologies	M7T	293	Development and sales of an enterprise imaging management platform	12.6%	79.9%	\$1.250
Genetic Signatures	GSS	287	Development and sale of molecular diagnostics (MDx) kits and products.	17.5%	95.1%	\$2.010
Clovercorp	CLV	277	Development and production of omega-3 food additives from tuna oil	-18.4%	-38.3%	\$1.665
Immutep	IMM	269	Developing immuno-oncology drug candidates IMP761 and IMP321 (eftilagimod alpha)	66.0%	59.6%	\$0.415
Imricor	IMR	260	Design, manufacture and sales of MRI-compatible products for cardiac ablation procedures to treat arrhythmias	-13.1%		\$2.260
Next Science	NXS	243	Commercialisation of anti-biofilm products	-0.4%	-33.5%	\$1.250
Race Oncology	RAC	227	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.	122.9%	821.1%	\$1.750
Emvision Medical Devices	EMV	219	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	14.3%	324.5%	\$3.120
Cyclopharm	CYC	198	A nuclear medicine company that markets the Technegas lung imaging system	3.7%	111.9%	\$2.500
AnteoTech	ADO	196	Developer of a biological coatings technology that can be applied to immunoassays, bio-separations, drug delivery and other medical devices	31.3%	377.3%	\$0.105
Probiotec	PBP	188	Manufacturer, marketer and distributor of a range of over the counter (OTC) pharmaceuticals, complementary medicines and speciality ingredients	34.8%	21.2%	\$2.400
Cogstate	CGS	187	Markets cognitive performance diagnostic products	54.9%	182.1%	\$1.100
Alcidion	ALC	183	Specialist health IT solution provider	32.1%	0.0%	\$0.185
Recce	RCE	183	Development of broad spectrum antibiotics	-7.9%	193.1%	\$1.055
Rhythm Biosciences	RHY	176	Developing Colostat, a blood test for the early detection of colorectal cancer	264.6%	573.1%	\$0.875
Somnomed	SOM	174	Markets oral devices for the treatment of sleep apnea and snoring	-7.9%	-28.3%	\$2.100
Atomo Diagnostics	AT1	172	Manufactures rapid diagnostic test devices for OEM customers	-18.7%	0.0%	\$0.305
Neuren Pharmaceuticals	NEU	151	Developing neuroprotective therapeutics	16.3%	-48.2%	\$1.285
Imagion Biosystems	IBX	145	Developing MagSense, a diagnostic technology which exploits the principles of superparamagnetic relaxometry	85.9%	480.0%	\$0.145
Impedimed	IPD	135	Markets products that aid the diagnosis of secondary lymphoedema, muscle wasting and other disorders	83.8%	-24.2%	\$0.125
Medadvisor	MDR	128	Medication adherence software platform company	-17.4%	-1.4%	\$0.355

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/20
Micro-X	MX1	128	Development of a mobile medical x-ray imager for hospitals, a version for deployed military use and a mobile security back-scatter imager	51.1%	77.5%	\$0.355
Botanix Pharmaceuticals	BOT	122	Developing BTX1503 for the treatment of acne. BTX1503 combines synthetic cannabidiol with a transdermal drug delivery system, Permetrex.	31.6%	52.4%	\$0.125
Kazia Therapeutics	KZA	110	Developing GDC-084 for the treatment of glioblastoma multiform (a brain cancer)	20.8%	93.3%	\$1.160
Resonance Health	RHT	107	Markets FerriScan, a non-invasive tool for measuring liver iron levels	45.5%	6.7%	\$0.240
Bionomics	BNO	107	Discovery and development of drugs to treat CNS diseases	3.6%	85.9%	\$0.145
Noxopharm	NOX	105	Developing a cancer treatment, NOX66, a formulation of idronoxil, which targets NADH oxidase 2.	25.6%	75.0%	\$0.490
Oncosil Medical	OSL	101	Developing Oncosil, a brachytherapy for pancreatic cancer and liver cancer	-7.7%	-29.4%	\$0.120
Cynata Therapeutics	CYP	95	Stell cell technology company aiming to produce unlimited uniform, pharmaceutical grade MSCs from a single donor.	-33.5%	-34.1%	\$0.685
Immuron	IMC	94	Sales and development of hyper-immune bovine colostrum products for therapeutic use	66.0%	59.6%	\$0.415
Respiri	RSH	94	Respiratory and pulmonary devices company. Markets Airsona, an ehealth product	-38.1%	35.4%	\$0.130
SDI	SDI	93	Manufacture & distribution of amalgam (fillings) & other dental materials and product R&D	-0.6%	-6.0%	\$0.785
Compumedics	CMP	89	Develops, manufactures and markets sleep diagnostic and monitoring equipment.	16.3%	-37.5%	\$0.500
Painchek	PCK	87	Commercialising a smartphone app which uses facial recognition technology to detect indications of pain. TGA cleared and CE Marked.	-11.5%	-59.5%	\$0.077
Proteomics International	PIQ	83	Provider of protein chemistry analytical services. Seeking to commercialise a diabetic kidney disease diagnostic.	52.9%	194.4%	\$0.795
Orthocell	OCC	83	Developing and marketing regenerative medicine products	12.5%	-8.2%	\$0.450
Exopharm	EX1	79	Development of technology for improving the purification of exosomes, which are extra-cellular vesicles which transport bioactive molecules through out the body.	81.0%	119.2%	\$0.570
Control Bionics	CBL	78	Design, manufacture and sale of wireless wearable electromyography (EMG) based augmentative and alternative communication (AAC) technology	56.7%		\$0.940
Universal Biosensors	UBI	77	Development, manufacture and commercialisation of a range of in vitro diagnostic tests for point-of-care use	58.2%	128.9%	\$0.435
Memphasys	MEM	75	Developing a sperm separation technology, SpermSep	0.0%	100.0%	\$0.100
Antisense Therapeutics	ANP	75	Developing antisense compounds to treat multiple sclerosis and Duchenne Muscular Dystrophy	-10.3%	44.4%	\$0.130
Osteopore	OSX	61	Manufacture of 3D bioresorbable implants. Three products are FDA cleared and CE Marked for cranio-facial indications	-3.7%	-28.8%	\$0.520
ResApp Health	RAP	59	Developing digital healthcare solutions to diagnose and manage respiratory conditions	-19.0%	-65.3%	\$0.085

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/20
TBG Diagnostics	TDL	59	Development of HLASSA and SBT diagnostic kits and related services	0.0%	900.0%	\$0.270
Genetic Technologies	GTG	58	Markets cancer risk tests	-12.5%	40.0%	\$0.007
Invion	IVX	55	Development of Photosoft, a photosensitiser derived from chlorophyll, which it is believed can accumulate selectively in tumours and be manipulated for therapeutic purposes.	0.0%	-23.1%	\$0.010
Biotron	BIT	55	Developing a drug to treat HIV. Testing drug library against SARS-CoV-2	-14.3%	50.0%	\$0.078
BARD1 Life Sciences	BD1	54	Developing cancer diagnostics and therapies. Completed 30:1 consolidation.	-12.8%	-33.3%	\$0.680
Vita Life Sciences	VLS	54	Development, manufacture and distribution of prescription and OTC medicines as well as complementary and alternative medicines, dietary supplements and health foods	14.9%	49.3%	\$1.000
Optiscan Imaging	OIL	53	Manufactures confocal microscopes for clinical diagnosis	8.2%	176.3%	\$0.105
Nova Eye Medical	EYE	51	Developing devices devices to treat glaucoma	7.6%	-54.2%	\$0.355
Invex Therapeutics	IXC	48	Developing a formulation of the diabetes drug exanatide to treat idiopathic intracranial pressure and other indications	-25.5%	-16.9%	\$0.715
CardieX	CDX	48	Development of wearable blood pressure measurement devices	14.3%	100.0%	\$0.056
IMEXHS	IME	48	Markets a radiology and imaging platform, in Latin and South America, and uses SaaS and PaaS revenue models. Completed 50:1 consolidation.	-10.6%		\$1.610
Dimerix	DXB	46	Developing a combination therapy, DMX200, to treat chronic kidney disease.	-23.0%	80.8%	\$0.235
Avecho Biotechnology	AVE	46	Commercialising a drug delivery system	262.5%	625.0%	\$0.029
Star Combo Pharma	S66	45	Develops, manufactures and markets nutritional and OTC products	-1.5%	-32.0%	\$0.330
IDT Australia	IDT	44	Manufacturer of pharmaceutical ingredients to international standards for major pharmaceutical groups.	5.7%	32.1%	\$0.185
Patrys	PAB	43	Developing novel antibody therapies for a range of oncology indications. Focussed on 3E10, a cell penetrating antibody.	60.0%	20.0%	\$0.024
Prescient Therapeutics	PTX	43	Developing compounds to treat various cancers	-1.5%	9.8%	\$0.067
Rhinomed	RNO	41	Developing nasal stent technologies with applications for sport performance, sleep and drug delivery	-3.0%	-23.8%	\$0.160
TALI Digital	TD1	39	Software company developing tools for assessment and improvement of attention in children. Formerly Novita Healthcare.	80.8%	-7.8%	\$0.047
Vectus Biosystems	VBS	38	Developing an anti-fibrotic compound, VB0004, with applications in heart and kidney disease	21.2%	103.4%	\$1.200
Regeneus	RGS	38	Commercialisation of autologous adipose derived stem cells and factors. Markets HiQCell for human use and CryoShot for veterinary use.	-19.4%	43.7%	\$0.125
Oventus	OVN	37	Developing an oral appliance to treat sleep apnea and snoring	3.5%	-52.0%	\$0.235

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/20
Pharmaxis	PXS	37	Developer of Bronchitol, which is approved in Europe and the USA for the management of cystic fibrosis. Developing a suite of compounds from amine oxidase platform.	9.4%	-41.9%	\$0.093
Allegra Orthopedics	AMT	37	A developer and manufacturer of prosthetic implants and medical devices.	133.3%	75.0%	\$0.350
Osprey Medical	OSP	36	Markets DYEVERT, a device which reduces the amount of dye needed in imaging procedures	-15.4%	-26.7%	\$0.022
LBT Innovations	LBT	35	Developer of innovative products which deliver productivity benefits across a range of life science settings	-6.2%	-23.8%	\$0.122
Acrux	ACR	35	Developer of topical generic drugs	-10.8%	-13.2%	\$0.165
Invitrocue	IVQ	35	Singapore-based analytical services company (life sciences)	0.0%	0.0%	\$0.060
PharmAust	PAA	33	Developing a veterinary anti-parasitic compound (PPL-1) as a human and animal cancer therapy	-19.2%	-1.9%	\$0.105
Adalta	1AD	31	Developing AD-214 for the treatment of idiopathic pulmonary fibrosis (IPF) and other human fibrotic diseases	0.0%	8.7%	\$0.125
Total Brain	TTB	31	Development and commercialisation of functional brain analysis techniques.	-22.9%	-61.9%	\$0.320
Actinogen Medical	ACW	30	Developing Xanamem for the treatment of dementia in Alzheimer's disease patients	-22.2%	-41.7%	\$0.021
Alterity Therapeutics	ATH	27	Developing PBT434 for synucleinopathies	-38.0%	55.0%	\$0.031
Nyrada	NYR	26	Developing drugs to treat cardiovascular, neurological and chronic inflammatory diseases	23.1%	0.0%	\$0.240
Bluechiip	BCT	26	Development, manufacture and commercialisation of a tracking system for biological samples	-31.3%	-71.6%	\$0.044
Neurotech International	NTI	25	Has acquired proprietary cannabis strains for treating autism, epilepsy and ADHD	246.2%	181.3%	\$0.045
Visioneering Technologies	VTI	25	Markets a next-generation contact lens	-21.9%	-51.9%	\$0.025
Nutritional Growth Solutions	NGS	25	Development and sale of nutritional supplements for children	30.0%		\$0.260
USCOM	UCM	25	Markets Uscom, a non-invasive heart output function monitor, BP+ non-invasive central blood pressure product and digital ultrasonic spirometry products	-11.1%	33.3%	\$0.160
Hexima	HXL	24	Developing HXP124 to treat fungal infection of toenails	-7.5%		\$0.185
Anteris Technologies	AVR	24	Application of proprietary ADAPT technology to treat tissue used in the manufacture of cardiovascular prostheses	-5.1%	-62.5%	\$3.750
Neuroscientific Biopharm.	NSB	22	Developing EmtinB, an LRP-1 receptor agonist for the treatment of Alzheimer's disease	-5.7%	31.6%	\$0.250
Asian American Medical Group	AJJ	22	Manages liver treatment centres in Asia; expanding into radiation oncology	116.7%	-18.8%	\$0.065
Bio-Gene Technology	BGT	21	Commercialisation of the insecticides Flavocide (synthetic) and Qcide (plant-derived), in the fields of human health and crop protection.	-22.2%	-30.0%	\$0.140

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/20
Adherium	ADR	19	Commercialising personal digital medication monitoring systems to improve patient compliance and medication efficacy	-6.7%	0.0%	\$0.028
Cryosite	CTE	19	Provides specialised storage services, especially for umbilical cord blood	75.6%	645.3%	\$0.395
Holista Colltech	HCT	17	Markets dietary supplements and disinfectant products	24.1%	-8.9%	\$0.072
Heramed	HMD	17	Commercialising a home pregnancy monitoring technology	-21.4%	-31.3%	\$0.110
Suda Pharmaceuticals	SUD	15	Developing drugs for oro-mucosal administration. Recently acquired IP for anagrelide, with intent to develop it as an anti-cancer therapy	-7.0%	-97.2%	\$0.040
StemCell United	SCU	15	Applies a proprietary stem cell technology to culture and grow plant extracts for use in Traditional Chinese Medicine.	72.7%	35.7%	\$0.019
Cellmid	CDY	13	Develops and markets therapies and diagnostic tests for fibrotic diseases, cancer, ischemic diseases of the heart and hair loss.	-4.3%	-50.0%	\$0.110
Amplia Therapeutics	ATX	13	Developing drug candidates to treat fibrotic cancers and fibrosis. Formerly Innate Immunotherapeutics.	33.3%	258.2%	\$0.240
Dorsavi	DVL	12	Commercialising a wireless sensor movement monitoring system and products for use in the Elite Sports, OH&S and medical/physiotherapy markets	20.6%	57.7%	\$0.041
Lifespot Health	LSH	12	Commercialising the Bodytel diagnostic software, which is deployed with its Medihale medical cannabis vaporiser system, as well as with patients with metabolic syndrome	57.1%	126.5%	\$0.077
Anatara Life Sciences	ANR	12	Developing a gastrointestinal dietary supplement	-19.0%	-29.2%	\$0.170
Medibio	MEB	11	Commercialising a test for depression and anxiety	-33.3%	-20.0%	\$0.008
Analytica	ALT	11	Markets the Pericoach product to aid in the management of female urinary incontinence.	0.0%	0.0%	\$0.003
Simavita	SVA	9	Commercialising an incontinence assessment technology.	-15.8%	-36.0%	\$0.016
Living Cell Technologies	LCT	8	Development of NTCELL for the treatment of Parkinson's Disease, and potentially for eye and ear diseases	-6.7%	-12.5%	\$0.014
Jayex Healthcare	JHL	8	Commercialisation of the Enlighten patient workflow platform	-7.1%	30.0%	\$0.039
Bioxyme	BXN	8	Sale and distribution of probiotics	9.1%	-14.3%	\$0.012
Factor Therapeutics	FTT	5	Looking to acquire veterinary medical technology pipeline. Suspended from trading.	0.0%	66.7%	\$0.005
Medigard	MGZ	3	Suspended from trading. Under administration.	0.0%	0.0%	\$0.020
Capitalisation Total		20,619				

Listed Biotech Investment Funds or Companies

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 31/12/20
BTC Health	BTC	21	Provides capital and management expertise to high-growth Australian biotech, medtech and pharmaceutical companies	-4%	-30%	\$0.087
Capitalisation Total		21				

Botanical Product Companies (Cultivated Production)

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 30/09/20
Creso Pharma	CPH	162	Development of cannabis and hemp derived therapeutic, nutraceutical, and life style products with wide patient and consumer reach for human and animal health.	373.7%	44.0%	\$0.180
Incannex	IHL	161	Developing medical cannabis products to treat OSA, TBI and ARDS and TMD	106.7%	150.0%	\$0.155
Cann Group	CAN	159	Medicinal cannabis company focused on the breeding, cultivation and production stages. Holds Australian ODC cultivation (MC) and research license (CR).	40.5%	-6.3%	\$0.590
Elixinol Global	EXL	111	A supplier of hemp and medicinal cannabis products	7.6%	-54.2%	\$0.355
Althea Group	AGH	110	Supply of branded medicinal cannabis products in Australia. To cultivate, extract and manufacture medicinal cannabis. Holds ODC manufacturing license.	-12.1%	16.0%	\$0.435
Zelira Therapeutics	ZLD	108	Developer of medicinal cannabis therapeutic products	37.3%	67.3%	\$0.092
Palla Pharma	PAL	102	Vertically integrated opiate manufacturer	8.0%	-23.2%	\$0.810
Little Green Pharma	LGP	77	Sale and distribution of medicinal cannabis products	105.5%		\$0.565
Medlab Clinical	MDC	65	Development, production and marketing of nutraceuticals cannabis product to treat cancer patients with intractable pain	33.3%	-21.3%	\$0.240
Auscann Group Holdings	AC8	62	Developing medical cannabis products for the Australian market. Merging with CP1.	30.0%	-27.8%	\$0.195
Bod Australia	BDA	52	Developer and distributor of natural, evidence-based cosmetics and natural medicines. Holds medicinal cannabis import license. Overseas partner is Linnea SA	28.9%	63.3%	\$0.490
MGC Pharmaceuticals	MXC	45	A medical and cosmetic cannabis company with growing operations in Slovenia. Acquired Czech company Panax Pharma.	8.7%	-21.9%	\$0.025
THC Global Group	THC	45	A diversified global cannabis company with operations in Australia and Canada	0.0%	-38.2%	\$0.235
Cann Global	CGB	36	Operates a hemp seeds business and conducts medical cannabis research	75.0%	-50.0%	\$0.007
Cronos	CAU	17	Medicinal cannabis health and wellness business	52.9%		\$0.130
CannPal Animal Therap.	CP1	16	Research and development of cannabis-based therapeutics for companion animals. Merging with AC8.	70.0%	41.7%	\$0.170
Fiji Kava	FIJ	15	Cultivation and development of kava (piper methysticum) as an alternative treatment for anxiety, pain and insomnia.	-36.8%	60.0%	\$0.120
eSense Health	ESE	9	Specialises in phytochemical profiling of plants to develop and reverse engineer terpenes for medical and other applications. Suspended from trading.	0.0%	38.5%	\$0.018

Capitalisation Total 1,353

Capitalisation Total - All Indices 207,701

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 of 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

Corporate Subscribers: Cogstate, LBT Innovations, Opthea, ResApp Health, Pharmaxis, Dimerix, Adalta, Actinogen Medical, Patrys, Cyclopharm, Antisense Therapeutics, Imugene, Exopharm, Immutep, Neuroscientific Biopharmaceuticals, Invex Therapeutics, Anteris Technologies

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