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BIOSHARES

Australia's Independent Biotech Investment Resource, est. 1999

18 January 2023
Edition 932

Companies covered: **Half Year Review, CUV, LBT, TLX**

	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 - May '21)	86.8%
Year 21 (May '21 - May '22)	-15.6%
Year 22 (May '22 - Dec '22)	-2.2%
Year 23 (CY2023)	6.0%
Cumulative Gain	1680%
Av. Annual gain (22 yrs)	18.1%

2023 Top Six Picks: +10.3%



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Australian Biotechs Expected to Continue Recovery into 2023

Australian biotech stocks staged a modest recovery in the second half of 2022, up 8.1%, after a savage performance in the first half of the year which saw the sector decline by 41%.

This followed the US market, which recovered by 12.4% as measured by the Nasdaq Biotech Index. However given the US index declined by only 20.7% in the first half, local stocks can be expected to continue their recovery into 2023.

All indices were up (see table below) including the ASX300 which bounced back by 7% in the last six months.

Capital Raises

In what should have been a difficult period for raising funds, just over \$900 million was raised in the second half of 2022, up from \$552 million in the first half (see table on page 3). December half capital raisings were bolstered by a \$371 million raise by Opthea.

In a novel raising for the Australian biotech sector, Opthea's raise included US\$170 million which was raised not through equity but from a payment commitment from future sales of its drug candidate OPT-302 to Launch Therapeutics, which stands to receive up to four times the funding provided (US\$680 million). Opthea also raised US\$90 million through a private placement at \$1.15 a share.

Other significant capital raises were conducted by Paradigm Biopharmaceuticals (\$66 million), Mesoblast (\$65 million) and by Polynovo (\$53 million).

There were no biotech listings during the quarter, reflecting the difficult and uncertain market conditions.

M&A

There was one major acquisition last year, that of ResApp Health by Pfizer for \$180 million. Pfizer was attracted to the utility of ResApps phone-based test for diagnosing COVID-19, as well as use of the test for remote detection of other respiratory infections and conditions.

The year ahead may see additional acquisitions of Australian biotechs, particularly those with significant revenue streams displaying high growth.

Index Performance

	Q3 2021	Q4 2021	1H 2022	2H 2022	Change in 12 mths
Bioshares Index	1.3%	-3.8%	-41.5%	8.1%	-37.1%
Bioshares Large Cap Index	5.2%	-2.2%	-10.9%	5.8%	-5.8%
Bioshares Botanicals Index	0.2%	10.8%	-53.3%	9.1%	-50.1%
Nasdaq Biotech Index	-1.2%	-7.0%	-20.7%	12.4%	-10.9%
ASX 300 Index	0.3%	1.7%	-12.2%	7.0%	-6.1%

Top 10 Outperformers - 2H 2022

Company	Code	Change - Half
Cronos Australia	CAU	134%
Jayex Healthcare	JTL	120%
Bod Australia	BOD	114%
Neuren Pharmaceuticals	NEU	109%
Actinogen Medical	ACW	100%
Bioxyn	BXN	100%
Medibio	MEB	100%
Clarity Pharmaceuticals	CU6	94%
Microba Lifesciences	MAP	66%
INOVIQ	IIQ	64%

Outperformers

Cronos Australia was the best performing biotech in the second half of 2022, with its share price up 134% over the six month period. Cronos is a medicinal cannabis products company that also operates medicinal cannabis clinics in Queensland. In FY2022 the company increased revenue by 208% to \$67 million and delivered a net profit of \$6 million.

Neuren Pharmaceuticals was up 109% for the period, with its partner Acadia Pharmaceuticals having filed trifinotide for approval with the FDA. A decision is expected on 12 March with no advisory committee meeting requested by the regulator which is very encouraging. Neuren received a US\$10 million milestone payment for this event. It stands to receive a further US\$40 million upon first product sales, around US\$33 million from sale of the Priority Review Voucher that Acadia will receive upon approval, as well as royalties from product sales. Neuren is currently conducting three Phase II studies with a follow-on compound.

Actinogen Medical's share price double during the half with positive details emerging from a retrospective analysis of its Phase II Alzheimer's disease study. It showed a cognitive benefit in patients who have higher than normal levels of the tau protein in the blood. The FDA has agreed to a six month Phase II study in this patient subgroup.

Clarity Pharmaceuticals was up 94% for the half year, which followed a 31% decline in the first half of 2022. The company achieved positive results from a Phase I prostate cancer imaging study and has started a Phase II treatment study with its radioisotope-based products. Interest in radiopharmaceuticals remains high with Telix Pharmaceuticals gaining strong immediate sales of its Illuccix prostate cancer imaging product in the US. (See page 6)

Microba Lifesciences is a microbiome discovery and service business. It listed at the end of 2021 at \$0.45 a share. Its share price was up 66% after Sonic Healthcare acquired a 19.99% stake for \$17.8 million. Part of the deal is a strategic partnership to deliver Microba's tests throughout the US, Europe and Australasia.

Inoviq's share price increased by 64% with the company deliver-

ing positive results with its ovarian cancer diagnostic test. The test uses exosomes from plasma and achieved a 92% accuracy in a trial involving 97 samples.

Underperformers

Last year was not a good time to be announcing negative clinical study news to investors. Kazia Therapeutics was notified by the study sponsor that its drug candidate paxalisib would not be continuing to the next stage of an adaptive design trial evaluating multiple therapies at once. Its share price was down 85%.

Lumos Diagnostics was informed by the FDA that its FebriDx test, for differentiating between bacterial and viral infections, would not be approved. It was complicated by the level of SARS-CoV-2 infections that the regulator did not want to be misdiagnosed and not gain treatment. It subsequently closed its US Sarasota facility and will raise up to \$8 million through a convertible note facility. Its share price slumped by 67%.

Biotron's share price was down 56%, which followed the announcement of a rights issue that would be conducted at a 33% discount. Exopharm's share price continues to slide. It was down 75% in the first half of last year and by 54% in the second half. The company has announced cost cutting and its clinical program has been slow to progress.

Nutritional Growth Solutions has been in a steady decline over the last six months. Its share price was down 45%, although sales were up 32% in the September quarter to \$0.8 million. Adherium has also been experiencing a sliding share price over the year, down 43% for the half. It raised \$13.5 million in September from existing and new institutional investors.

Top 10 Underperformers - 2H 2022

Company	Code	Change - Half
Kazia Therapeutics	KZA	-85%
TALI Digital	TD1	-67%
Lumos Diagnostics	LDX	-66%
Memphasys	MEM	-65%
Fiji Kava	FIJ	-56%
Biotron	BIT	-56%
Exopharm	EX1	-54%
Nutritional Growth Solutions	NGS	-45%
Adherium	ADR	-43%
Creso Pharma	CPH	-43%

Capital Raisings by ASX-listed Life Science Companies, 2H 2022

Company	Code	Investment Manager or Investor	Type of Raising	Funds Raised (\$M)	Share price
Opthea	OPT		Funding from future product sales	\$243.00	n/a
Opthea	OPT	MST Financial & Jefferies	Placement	\$128.6	\$1.15
Imugene	IMU	Bell Potter Securities	Placement	\$80	\$0.20
Paradigm Biopharm.	PAR	Bell Potter Securities	Placement and Rights Issue	\$66.00	\$1.30
Mesoblast	MSB	M&G Investments (investor)	Placement	\$65.00	\$0.75
Polynovo	PNV		Placement, SPP	\$53.00	\$1.90
Medical Developments	MVP	Bell Potter Securities	Placement, SPP	\$30.00	\$2.00
Microba Life Sciences	MAP		Placement	\$17.80	\$0.26
MedAdvisor	MDR	MA Moelis Au Adv. & Peleton Capital	Rights issue	\$14.60	\$0.14
Adherium	ADR	MST Financial	Placement	\$13.50	\$0.005
Incannex Healthcare	IHL	Bell Potter Securities	Placement	\$13.00	\$0.205
Prescient Therapeutics	PTX	Reach Corporate	Placement, SPP	\$11.30	\$0.115
Next Science	NXS	Walker Group Holdings	Convertible Note	\$10.00	\$0.72
Radiopharm Theranostics	RAD	Bell Potter Securities	Rights issue	\$10.00	\$0.14
Pharmaxis	PXS	Morgans Corporate & Bell Potter Securities	Placement	\$10.00	\$0.06
Neurotech Int.	NTI	PAC Partners and Peloton Capital	Placement	\$9.00	\$0.10
Cann Group	CAN		Rights issue	\$8.20	\$0.22
Proteomics Int. Labs	PIQ	Morgans, Euroz Hartleys Securities	Placement	\$8.00	\$0.85
Lumos Diagnostics	LDX	The Lind Partners & SBC Global Inv.	Convertible Note	\$8.00	-
Bionomics	BNO	Aegis Capital Corp. & Berenberg	Placement	\$7.50	\$0.064
Micro-X	MX1	Varex Imaging Corp.	Placement	\$7.50	\$0.147
Botanix Pharmaceuticals	BOT	Euroz Hartleys	Placement	\$7.50	\$0.066
Creso Pharma	CPH	EverBlu Capital Corp.	Placement	\$7.00	\$0.04
CardieX	DCX	MST Financial Services	Placement, SPP	\$6.00	\$0.30
Botanix Pharmaceuticals	BOT	Antares Capital (Investor)	Placement, SPP	\$5.90	\$0.063
MGC Pharmaceuticals	MXC	Mercer Street Capital Partners	Convertible Note	\$4.70	-
TALI Digital	TD1	Taylor Collison	Placement and Rights Issue	\$4.60	\$0.002
Vectus Biosystems	VBS		Placement and Rights Issue	\$4.35	\$0.80
Biotron	BIT	Mahe Capital	Rights issue	\$4.20	\$0.03
Heramed	HMD	PAC Partners	Placement	\$4.00	\$0.13
IMEXHS	IME	Morgans Corporate	Placement and Rights Issue	\$4.00	\$0.48
HitIQ	HIQ		Rights issue	\$4.00	\$0.03
Little Green Pharma	LGP		Placement	\$4.00	\$0.20
Imricor Medical Systems	IMR	K.A.H.R. Foundation	Convertible Note	\$3.90	US\$0.2691
Nutritional Growth Sol.	NGS	Molo Capital	Placement	\$3.80	\$0.12
Bod Australia	BOD	Taylor Collison	Placement and Rights Issue	\$3.50	\$0.08
Memphasys	MEM	Canaccord Genuity	Placement and Rights Issue	\$3.40	\$0.02
Althea Group	AGH	Canaccord Genuity	Placement and Rights Issue	\$2.40	\$0.067
Epsilon Healthcare	EPN		Placement	\$1.65	\$0.03
Respiri	RSH		Placement	\$1.60	\$0.04
PainChek	PCK	Canaccord Genuity	Rights issue	\$1.60	\$0.028
Fiji Kava	FIJ		Placement	\$1.60	\$0.02
InhaleRx	IRX	Peak Asset Management	Placement	\$1.20	\$0.06
Opthea	OPT		SPP	\$0.94	\$1.15
LBT Innvoations	LBT	PAC Partners	Rights issue	\$0.50	\$0.065
Singular Health Group	SHG		Rights Issue	\$0.50	\$0.115
Anatara Lifesciences	ANR	Taylor Collison	Rights issue	\$0.50	\$0.035
Dorsavi	DVL		Rights issue	\$0.30	\$0.01
total				\$901.6	

Total raised in 1H 2022

\$552

Total raised in 2H 2022

\$902

Total raised 2022**\$1,454**

Selected Clinical Trial Developments & Product Launches - 2H 2022

Company	Code	Product/Application	Event
Approval Stage			
Neuren Pharmaceuticals	NEU	Trofinetide for Rett syndrome	Acadia Pharmaceuticals (NEU partner) filed drug candidate for FDA approval
Polynovo	PNV	Novosorb BTM	Registered for use in Canada
Rhythm Biosciences	RHY	ColoSTAT for colon cancer detection	Approved in NZ
Botanix Pharmaceuticals	BOT	Sofpironium bromide for treatment of excessive sweating	Accepted for review by FDA
Starpharma	SPL	VIRALESE spray for respiratory viruses, including coronavirus	Registered in Indonesia
Starpharma	SPL	VIRALESE spray for respiratory viruses, including coronavirus	Launched in Hong Kong and Macau
Acrux	ACR	Generic Emla (prilocaine/lidocaine)	Launched in USA through Padagis
Acrux	ACR	Aciclovir generic	Accepted for review by FDA

Approval Products - Additional Studies			
Rhinomed	RNO	Junior nasal swab for SARS-CoV-2	100% sensitive in detecting virus (n=53)
Nutritional Growth Solutions	NGS	Grow Daily Boys 10+ supplement	Dose response gain in height, weight and muscle mass in 6 month extension study
Starpharma	SPL	VIRALEZE for COVID-19	Phase IV study commenced in pts with COVID-19 (n=160)
Biome Australia	BIO	Biome Lift for depression	Trial fully recruited (n=40)
Clover Corporation	CLV	DHA supplement for premature kids	IQ improvement (n=1273) by 3.5 points
Avita Medical	AVH	RECELL for soft tissue injuries with meshed autograft	Statistically significant improvement in donor tissue sparing (p<0.001). Similar healing (non-inferiority) to control (p<0.025).
Polynovo	PNV	NovoSorb SynPath for chronic diabetic foot ulcers	First patient enrolled in USA study (n=138)

Phase III / Registration Studies			
Dimerix	DXB	DMX-200 for treatment of FSGS (kidney disease)	First stage of Phase III study fully recruited (n=72)
Neurotech Int.	NTI	NTI164 for treatment of autism	Phase II/III commenced
Invex Therapeutics	IXC	Presendin for treatment of intracranial hypertension	First patient started in Phase III study (n=240)
Genetic Signatures	GSS	Antimicrobial resistance detection	Excellent sensitivity and specificity achieved.
Genetic Signatures	GSS	Enteric protozoan diagnostic kit	Pivotal study completed recruitment (n=1500)
Mesoblast	MSB	GvHD in children	51% survival at two years compared to expected 25%-38%
Mesoblast	MSB	Allogenic stem cells for heart failure	In 565 Phase III study, improved ejection fraction compared to control
Avecho Biotechnology	AVE	Oral CBD soft gel for insomnia	Ethics approval to start Phase III (n=540)

Continued over

Selected Clinical Trial Developments & Product Launches - 2H 2022 (Cont'd)

Company	Code	Product/Application	Event
Phase II			
Neuren Pharmaceuticals	NEU	NNZ-2591 for treatment of Angelman syndrome and Phelan-McDermid syndrome	Phase II study in Pitt Hopkins syndrome started (n=20)
Neuren Pharmaceuticals	NEU	NNZ-2591 for treatment of Angelman syndrome and Phelan-McDermid syndrome	First of 20 patients treated in each Phase II study
Radiopharm Theranostics	RAD	F-18 Pivalate for treatment of brain metastases	High tumour uptake of radiopharmaceutical in Phase II imaging study (24 lesions assessed)
Anteris Technologies	AVR	DurAVR THV aortic valve replacement	Restoration of normal pre-disease blood flow through aorta at 6 mths
Clinuvel Pharmaceuticals	CUV	Afamelanotide for vitiligo treatment of face in darker skin patients	First patient in Phase II study treated. (n=6). Patients require previous treatment with NB-UVB
Pharmaxis	PXS	PXS-6302 for treatment of scars	Phase II: First 8 pts, positive changes in appearance of scars noted
Pharmaxis	PXS	PXS-5505 for myelofibrosis	Phase II: Good safety profile, 5/6 pts with stable or improved bone marrow fibrosis scores and platelet/hemoglobin scores (n=6)
Neurotech Int.	NTI	NTI164 for autism	Extension to Phase II study (n=12) treated for 20 weeks. Significant changes from baseline in 1. Severity of illness 2. Anxiety. 3 Social responsiveness and 4. Adaptive behaviour
Neurotech Int.	NTI	NTI164 for treatment of neurological disorder (PANDAS/PANS)	Phase I/II commenced
Botanix Pharmaceuticals	BOT	BTX 1702 for treatment of rosacea	Phase I/II trial: Statistically significant effect (p=0.02) on reducing inflammatory lesions compared top control (n=133) although lower dose more effective
Actinogen Medical	ACW	Xanamem for treatment of depression	First pt treated (n=160)
Actinogen Medical	ACW	Xanamem for treatment of Alzheimer's disease	Retrospective analysis in patients with medium to high tau levels: Benefit in cognitive function but not statistically sig with low pt numbers
Starpharma	SPL	DEP cabazitaxel	7.5% severe adverse events compared to expected 40% for standard cabazitaxel
Immutep	IMM	NSCLC	ORR of 38.6% (n=114) compared to expected 21.3% with Keytruda alone
Paradigm Biopharmaceuticals	PAR	Osteoarthritis	Primary endpoint met - improvement in synovial fluid levels (n=61)
EMVision	EMV	Stroke diagnosis using microwave technology	Stage 1 of study (n=30 healthy volunteers) started to be followed by Stage 2 (n=150 stroke pts)
Inoviq	IIQ	EXO-NET test for ovarian cancer detection	Successful study (n=97) with 92% accuracy
Proteomics Int.	PIQ	Blood test for endometriosis	78% sensitivity, 85% specificity (n=872)
Proteomics Int.	PIQ	Blood test for oesophageal cancer	90% sensitivity, 64% specificity (n=253)
Clarity Pharmaceuticals	CU6	Prostate cancer therapy	First pt treated in Phase I/II study (n=44)
Orthocell	OCC	Treatment of rotator cuff tendon tear with autologous stem cells	All pts achieved almost complete resolution of pain at 6 months (n=9)
Alterity Therapeutics	ATH	ATH434 for Multiple System Atrophy	Phase II study: First pt treated (n=60)
PharmAust	PAA	Monepantel for motor neuron disease	Phase I/II: First 6 pts treated
Zelira Therapeutics	ZLD	ZLD007 for diabetic nerve pain	Phase II study fully enrolled (n=60)

Phase I			
Clarity Pharmaceuticals	CU6	64Cu SAR-bisPSMA for prostate cancer treatment	Compared against histopathology and Illuccix (n=30). Met all endpoints with Phase III study in planning.
Kazia Therapeutics	KZA	Paxalisib for brain metastases	Complete or partial response in all pts (n=9)
Argenica	AGN	ARG-007 for ischemic stroke treatment	Safe and well tolerated in volunteers (n=8)
Vectus Biosystems	VBS	VB004 for hypertension	Phase I result: safe and well tolerated with 10-15hr half life, suitable for once a day oral dosing
Imagion Biosystems	IBX	MagSense for breast cancer imaging	Phase I: May help discriminate cancer nodes from normal nodes (n=6)
Incannex Healthcare	IHL	IHL-675A (cannabidiol + hydroxychloroquine) as anti-inflammatory	Safe and well tolerated.

Continued over

Selected Clinical Trial Developments & Product Launches - 2H 2022 (Cont'd)

Company	Code	Product/Application	Event
Primary Endpoint Not Met or Study Halted			
AFT Pharmaceuticals	AFT	IV Maxigesic for pain relief	CRL received from FDA
Anteotech	ADO	SARS-CoV-2 test	European trial halted
Dimerix	DXB	DXB-200 for treatment of COVID-19	Little benefit observed with pts heavily pretreated
Bionomics	BNO	NBC210 for treatment of anxiety	Did not meet primary endpoint (n=151) although 'consistent trends in improvement
Anatara Lifesciences	ANR	3DFC for psychological functioning	Trial halted due to insufficient sample size
Kazia Therapeutics	KZA	Paxalisib for glioblastoma	In multi-therapy study, treatment with paxalisib did not meet criteria for continuation.
Lumos Diagnostics	LDX	FebriDx test to confirm whether bacterial or viral infection	FDA declined marketing approval

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Clinuvel Pharmaceuticals - Positive Early Results in Skin DNA Repair has Wider Implications

Clinuvel Pharmaceuticals (CUV: \$26.68) has achieved some early encouraging results in its skin DNA repair study.

Three patients with xeroderma pigmentosa (a genetic disease that results in frequent skin cancers due to an inability to achieve skin DNA repair) have been treated with afamelanotide, which is a melanocortin that is commercialised by the company as Scenesse.

After six doses of the drug therapy following UV-induced skin damage, early evidence shows that increasing the melanin skin density with afamelanotide was providing a barrier to UV light and also with indication of cellular repair in the skin.

This study is not important just for the treatment of patients with this condition, but also for the wider claims that the company will be able to make for its melanocortin therapies against sun damage, particularly for at-risk populations.

Clinuvel is capitalised at \$1.3 billion

Bioshares recommendation: **Buy**

Bioshares

LBT Innovations Partners with AstraZeneca for New Application

The LBT Innovations (LBT: \$0.071) announced earlier this month that it had partnered with AstraZeneca to develop a new analysis module for use within pharmaceutical manufacturing.

It's expected to take around 12 months to develop and for AstraZeneca to validate the new application, which will use LBT's APAS Independence in drug manufacturing rooms. The APAS instrument is used to remove negative agar plate samples and is

ideally suited for applications when most of the samples will be clear of bacteria.

The LBT instrument will compete with the offering from Rapid Micro Biosystems (RMB) in the US, which sold 29 systems at a price of US\$535,000 each in 2021. LBT CEO Brent Barnes said that its partner considered all available products but they did not satisfy the needs of the company. One of the constraints with the RMB system is that it includes an incubator, which restricts processing capacity to the incubation period. The LBT system is agnostic to the incubation system and can process 300 plates an hour. (The RMB system has a capacity of 660 plates).

LBT has also signed a contract with its distribution partner into the pathology industry, Thermo Fisher, to develop a system for the pharmaceutical industry. AstraZeneca will pay LBT \$1 million as part of the collaboration to develop the technology for the new application, and Thermo Fisher will pay LBT \$400,000. Upon completion of the development work with AstraZeneca, LBT will be able to sell the product to other customers as well.

LBT is capitalised at \$23 million.

Bioshares recommendation: **Speculative Buy Class B**

Bioshares

Telix Pharmaceuticals Continues Strong Market Penetration with Illucix

Telix Pharmaceuticals (TLX: \$7.07) continues to achieve strong sales growth from its recently launched radiopharmaceutical prostate cancer imaging test, Illucix.

Since launch in April last year, revenue has increased from \$22.5 million in the June quarter to \$55 million in the September quarter and \$78 million in the December quarter.

Continued over

Bioshares Model Portfolio (18 Jan 2023)

Company	Code	Price (current)	Price added to portfolio	Recommendation	Cap'n (\$M)	Date added
Telix Pharmaceuticals	TLX	\$7.07	\$7.85	Spec Buy A	\$2,225	December 2021
Clinuvel Pharmaceuticals	CUV	\$26.68	\$20.31	Buy	\$1,318	November 2020
Neuren Pharmaceuticals	NEU	\$8.94	\$3.25	Spec Hold A	\$1,126	December 2021
Aroa Biosurgery	ARX	\$1.18	\$1.11	Spec Buy A	\$404	November 2021
Cogstate	CGS	\$1.97	\$0.24	Buy	\$342	April 2019
Anteris Technologies	AVR	\$26.10	\$21.50	Spec Buy A	\$363	September 2022
Opthea	OPT	\$0.88	\$0.16	Spec Buy A	\$306	November 2014
Immutep	IMM	\$0.31	\$0.32	Spec Buy A	\$268	March 2019
Genetic Signatures	GSS	\$0.95	\$1.24	Buy	\$135	May 2022
Somnomed	SOM	\$1.32	\$2.05	Spec Buy A	\$109	January 2022
Antisense Therapeutics	ANP	\$0.095	\$0.22	Spec Buy B	\$69	November 2021
Micro-X	MX1	\$0.135	\$0.38	Spec Buy A	\$62	May 2017
Patrys	PAB	\$0.031	\$0.013	Spec Buy B	\$64	July 2020
Dimerix	DXB	\$0.150	\$0.09	Spec Buy B	\$48	December 2018
Pharmaxis	PXS	\$0.061	\$0.26	Spec Buy A	\$44	December 2016
Chimeric Therapeutics	CHM	\$0.083	\$0.27	Spec Buy B	\$36	December 2021
Rhinomed	RNO	\$0.110	\$0.27	Spec Buy B	\$31	December 2021
LBT Innovations	LBT	\$0.071	\$0.09	Spec Buy B	\$23	April 2022
Acrux	ACR	\$0.068	\$0.31	Spec Hold B	\$19	July 2017

Portfolio Changes

IN:
None

OUT:
None

– *Telix cont'd*

The original plan for Telix was that diagnostic sales would fund R&D of its therapeutics programs which is precisely what is occurring. In the last three quarters, the cashflow from operations has been -\$25.8 million, -\$5.4 million to \$1.6 million in the most recent quarter.

A Phase III prostate cancer treatment study in 392 patients is due to commence in Australia, the US and Europe.

Telix Pharmaceuticals is capitalised at \$2.2 billion. The company held cash of \$117 million at the end of December.

Bioshares recommendation: **Speculative Buy Class A**

Bioshares

The ASX-Listed Life Sciences Sector

31 December 2022: Capitalisation \$220 billion, 156 companies

Bioshares Large Cap. Index

Company	Code	Cap. \$m	Principal Activities	Change - Half	Change - Year	Price 31/12/22
CSL	CSL	138,758	Manufactures pharmaceutical products including vaccines and human plasma fractions	7.0%	-1.0%	\$287.76
Resmed Inc.	RMD	45,480	Manufactures diagnostic and treatment equipment for sleeping disordered breathing	0.9%	-13.5%	\$30.96
Cochlear	COH	13,426	Manufactures cochlear hearing implants	2.7%	-5.6%	\$204.12
Telix Pharmaceuticals	TLX	2,300	Development of molecularly-targeted radiation (MTR) therapies and diagnostics. Selles Illucix for prostate cancer imaging.	60.5%	-6.2%	\$7.27
Blackmores	BKL	1,408	Manufactures vitamin, mineral and herbal supplements and skin & hair products in Australia and N.Z.	2.6%	-20.9%	\$72.20
Polynovo	PNV	1,390	Developing and selling novel polymer-based products for treating wounds and burns	49.1%	32.5%	\$2.02
Nanosonics	NAN	1,296	Developing a novel disinfection technology. The first product, on the market, is a point of care ultrasound probe disinfection unit, branded Trophon EPR	27.7%	-32.0%	\$4.29
Clinuvel Pharmaceuticals	CUV	1,071	Markets an analogue of the alpha-MSH protein, named Scenesse, as a photo-protective agent	45.9%	-20.4%	\$21.67
Imugene	IMU	931	Developing two B-Cell cancer vaccines, HER-Vaxx and PD1-Vaxx, and an oncolytic virus technology, CF33	-19.4%	-64%	\$0.15
Pacific Edge	PEB	365	Commercialising a suite of bladder cancer test, to diagnose, triage and monitor patients. (Listed Q3 2021, primary listing in NZ)	-27.4%	-63.9%	\$0.45

Capitalisation Total 206,424

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Company	Code	Cap. \$m	Principal Activities	Change - Half	Change - Year	Price 31/12/22
Neuren Pharmaceuticals	NEU	1,026	Developing neuroprotective therapeutics	109.2%	110.9%	\$7.95
Sigma Pharmaceuticals	SIG	646	Pharmaceutical manufacturing and wholesaling	5.2%	27.1%	\$0.61
Mesoblast	MSB	564	Developing cellular medicines to treat advanced heart failure, chronic low back pain and acute graft versus host disease	42.6%	-38.3%	\$0.87
Opthea	OPT	427	Developing OPT-302 to treat wet AMD (an eye disease)	-16.8%	-29.3%	\$0.92
Paradigm Biopharm.	PAR	395	Developing pentosan polysulphate sodium to treat bone marrow oedema, joint pain and mucopolysaccharidosis type I	45.6%	-25.5%	\$1.41
Aroa Biosurgery	ARX	370	Manufacture and sale of wound healing and soft tissue reconstruction products	63.6%	5.9%	\$1.08
AFT Pharmaceuticals	AFP	356	Development and sale of pharmaceuticals in Australasia and Rest-of-World	1.5%	-13.5%	\$3.40
Mayne Pharma Group	MYX	348	Manufactures, develops and markets generic drugs, with operations in Australia and the USA	-20%	-32%	\$0.20
Cogstate	CGS	340	Markets cognitive performance diagnostic products	28.5%	-19.0%	\$1.96
Race Oncology	RAC	324	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.	3.1%	-44.2%	\$2.01
Anteris Technologies	AVR	309	Application of proprietary ADAPT technology to treat tissue used in the manufacture of cardiovascular prostheses	-22.9%	71.3%	\$22.20
Trajan Group Holdings	TRJ	266	Develops and manufactures scientific instruments for life sciences sector (Listed Q2 2021)	-12.5%	-55.1%	\$1.75

Bioshares Index (Cont'd)

Company	Code	Cap. \$m	Principal Activities	Change - Half	Change - Year	Price 31/12/22
Avita Medical	AVH	244	Markets ReCell, a skin repair product. Redomiciled to the US. Now Nasdaq listed and trades as CDIs. (20:1 share consolidation)	41.0%	-42.7%	\$1.96
Immutep	IMM	242	Developing immuno-oncology drug candidates IMP761 and IMP321 (eftilagimod alpha)	-5.2%	-43.9%	\$0.28
Starpharma Holdings	SPL	225	Developer of pharmaceutical chemical scaffolds known as 'dendrimers'	-25.7%	-59.0%	\$0.55
PYC Therapeutics	PYC	219	Developing VP-001 to treat retinitis pigmentosa	6.2%	-48.9%	\$0.07
Rhythm Biosciences	RHY	215	Developing Colostat, a blood test for the early detection of colorectal cancer	-13.9%	-36.1%	\$0.99
Alcidion	ALC	184	Specialist health IT solution provider	31.8%	-47.3%	\$0.15
Actinogen Medical	ACW	181	Developing Xanamem for the treatment of dementia in Alzheimer's disease patients	100.0%	-37.5%	\$0.10
Clarity Pharmaceuticals	CU6	180	A clinical stage radiopharmaceutical company focusing on the use of targeted copper theranostics. (Listed Q3 2021)	94%	34%	\$0.99
ResApp Health	RAP	179	Developing digital healthcare solutions to diagnose and manage respiratory conditions. ACQUIRED by Pfizer for \$180M in 2H 2022	60.0%	220.0%	\$0.21
Probiotec	PBP	176	Manufacturer, marketer and distributor of a range of over the counter (OTC) pharmaceuticals, complementary medicines and speciality ingredients	-3.6%	-1.4%	\$2.17
Clovercorp	CLV	170	Development and production of omega-3 food additives from tuna oil	24.6%	-27.7%	\$1.24
Next Science	NXS	147	Commercialisation of anti-biofilm products	-4.9%	-45.0%	\$0.69
Emvision Medical Devices	EMV	144	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	23.3%	-31.0%	\$1.85
Medadvisor	MDR	141	Medication adherence software platform company	52.9%	-34.2%	\$0.26
Impedimed	IPD	141	Markets products that aid the diagnosis of secondary lymphoedema, muscle wasting and other disorders	29.5%	-54.9%	\$0.08
Mach 7 Technologies	M7T	136	Development and sales of an enterprise imaging management platform	16.3%	-30.5%	\$0.57
Volpara Health Technologies	VHT	132	Markets breast density assessment tools and analytics, for use with breast x-ray screening programs	25.0%	-49.5%	\$0.53
Medical Developments	MVP	128	Commercialising the Pentrox inhaler for temporary pain relief. Used widely in ambulances across Australia.	1.4%	-70.4%	\$1.48
Genetic Signatures	GSS	126	Development and sale of molecular diagnostics (MDx) kits and products.	-24.1%	-50.8%	\$0.88
EBR Systems	EBR	124	Developing wireless cardiac pacing system. (Listed Q4 2021)	22.7%	-44.6%	\$0.46
4D Medical	4DX	124	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	-28.8%	-68.9%	\$0.42
Recce	RCE	117	Development of broad spectrum antibiotics	-25.8%	-35.9%	\$0.66
Microba LifeSciences	MAP	114	Developing therapeutics using microbiome derived drug candidates. Provides personalised microbiome testing and assessment. (Listed in 1H 2022)	66.0%	-26.2%	\$0.33
AnteoTech	ADO	113	Developer of a biological coatings technology that can be applied to immunoassays, bio-separations, drug delivery and other medical devices	-12.3%	-81.3%	\$0.06
INOVIQ	IIQ	110	Developing cancer diagnostics and therapies. (30 for 1 share consolidation conducted). Formerly Bard1. Acquired Sienna Cancer Diagnostics in 2020.	64.1%	-46.4%	\$1.20

Bioshares Index (Cont'd)

Company	Code	Cap. \$m	Principal Activities	Change - Half	Change - Year	Price 31/12/22
Proteomics International	PIQ	110	Provider of protein chemistry analytical services. Seeking to commercialise a diabetic kidney disease diagnostic.	2.2%	-21.8%	\$0.95
Cyclopharm	CYC	109	A nuclear medicine company that markets the Technegas lung imaging system	15.3%	-28.7%	\$1.17
SDI	SDI	107	Manufacture & distribution of amalgam (fillings) & other dental materials and product R&D	12.5%	-11.3%	\$0.90
Somnomed	SOM	107	Markets oral devices for the treatment of sleep apnea and snoring	6.6%	-45.1%	\$1.29
Prescient Therapeutics	PTX	97	Developing compounds to treat various cancers	-12.9%	-41.3%	\$0.14
Orthocell	OCC	81	Developing and marketing regenerative medicine products	1.2%	-19.6%	\$0.41
Antisense Therapeutics	ANP	68	Developing antisense compounds to treat multiple sclerosis and Duchenne Muscular Dystrophy	29.3%	-50.3%	\$0.10
Micro-X	MX1	67	Development of a mobile medical x-ray imager for hospitals, a version for deployed military use and a mobile security back-scatter imager	-7.1%	-49.0%	\$0.13
Botanix Pharmaceuticals	BOT	63	Developing BTX1503 for the treatment of acne. BTX1503 combines synthetic cannabidiol with a transdermal drug delivery system, Permetrex.	-7.0%	-5.4%	\$0.05
Immuron	IMC	63	Sales and development of hyper-immune bovine colostrum products for therapeutic use	-5.2%	-43.9%	\$0.28
Optiscan Imaging	OIL	63	Manufactures confocal microscopes for clinical diagnosis	-9.1%	-44.4%	\$0.10
Invion	IVX	58	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%	-57.1%	\$0.01
Patrys	PAB	56	Developing novel antibody therapies for a range of oncology indications. Focussed on 3E10, a cell penetrating antibody.	35.0%	-27.0%	\$0.03
Imricor	IMR	55	Design, manufacture and sales of MRI-compatible products for cardiac ablation procedures to treat arrhythmias	49.0%	-63.7%	\$0.37
Bionomics	BNO	53	Discovery and development of drugs to treat CNS diseases	-28.0%	-67.3%	\$0.04
Universal Biosensors	UBI	48	Development, manufacture and commercialisation of a range of in vitro diagnostic tests for point-of-care use	-39.2%	-77.3%	\$0.23
Dimerix	DXB	47	Developing a combination therapy, DMX200, to treat chronic kidney disease.	20.8%	-40.8%	\$0.15
CardieX	CDX	46	Development of wearable blood pressure measurement devices	16.1%	-47.8%	\$0.36
Oncosil Medical	OSL	45	Developing Oncosil, a brachytherapy for pancreatic cancer and liver cancer	12.5%	0.0%	\$0.05
Painchek	PCK	44	Commercialising a smartphone app which uses facial recognition technology to detect indications of pain. TGA cleared and CE Marked.	21.4%	-35.8%	\$0.03
Pharmaxis	PXS	44	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.	-6.2%	-49.2%	\$0.06
Cynata Therapeutics	CYP	43	Stem cell technology company aiming to produce unlimited uniform, pharmaceutical grade MSCs from a single donor.	-16.7%	-45.0%	\$0.30
Noxopharm	NOX	42	Developing a cancer treatment, NOX66, a formulation of idronoxil, which targets NADH oxidase 2.	-25.6%	-62.8%	\$0.15
Invex Therapeutics	IXC	41	Developing a formulation of the diabetes drug exanatide to treat idiopathic intracranial pressure and other indications	10.1%	-22.7%	\$0.55
Nova Eye Medical	EYE	41	Developing devices to treat glaucoma	51.4%	-17.6%	\$0.28

Bioshares Index (Cont'd)

Company	Code	Cap. \$m	Principal Activities	Change - Half	Change - Year	Price 31/12/22
Firebrick Pharma	FRE	39	Developing nasal spray treatment for common cold.	-13.2%	15.0%	\$0.23
Vectus Biosystems	VBS	38	Developing an anti-fibrotic compound, VB0004, with applications in heart and kidney disease	-25.9%	-48.2%	\$0.73
Respiri	RSH	37	Respiratory and pulmonary devices company. Markets Airsona, an ehealth product	-16.4%	-28.1%	\$0.05
Cryosite	CTE	36	Provides specialised storage services, especially for umbilical cord blood	15.9%	57.0%	\$0.73
Compumedics	CMP	35	Develops, manufactures and markets sleep diagnostic and monitoring equipment.	29.0%	-45.9%	\$0.20
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	-24.7%	-28.7%	\$1.36
Chimeric Therapeutics	CHM	35	Developing CART T therapy for solid cancers licensed from the City of Hope Cancer Center (Listed Q1 2021)	-13.0%	-69.2%	\$0.08
Radiopharm Theranostics	RAD	34	Developing radiopharmaceutical products for diagnosis and treatment of disease. (Listed Q4 2021)	-30.0%	-73.4%	\$0.11
Rhinomed	RNO	33	Developing nasal stent technologies with applications for sport performance, sleep and drug delivery	0.0%	-62.9%	\$0.12
Atomo Diagnostics	AT1	31	Manufactures rapid diagnostic test devices for OEM customers	-3.6%	-82.0%	\$0.05
Heramed	HMD	30	Commercialising a home pregnancy monitoring technology	28.9%	-47.9%	\$0.13
Argenica Therapeutics	AGN	29	Developing therapeutics to reduce brain damage following stroke (Listed Q2 2021)	4.7%	-46.1%	\$0.45
Genetic Technologies	GTG	28	Markets cancer risk tests	0.0%	-40.0%	\$0.00
Resonance Health	RHT	28	Markets FerriScan, a non-invasive tool for measuring liver iron levels	7.1%	-57.1%	\$0.06
Avecho Biotechnology	AVE	28	Commercialising a drug delivery system	15.4%	0.0%	\$0.02
Imagion Biosystems	IBX	27	Developing MagSense, a diagnostic technology which exploits the principles of superparamagnetic relaxometry	-11.1%	-68.4%	\$0.02
Alterity Therapeutics	ATH	24	Developing PBT434 for synucleinopathies	-23.1%	-52.4%	\$0.01
Biotron	BIT	23	Developing a drug to treat HIV. Testing drug library against SARS-CoV-2	-55.7%	-72.2%	\$0.03
Nyrada	NYR	23	Developing drugs to treat cardiovascular, neurological and chronic inflammatory diseases	7.4%	-39.6%	\$0.15
PharmAust	PAA	20	Developing a veterinary anti-parasitic compound (PPL-1) as a human and animal cancer therapy	-8.6%	-36.0%	\$0.06
Star Combo Pharma	S66	20	Develops, manufactures and markets nutritional and OTC products	-3.2%	-41.2%	\$0.15
Acrux	ACR	20	Developer of topical generic drugs	34.6%	-30.0%	\$0.07
IDT Australia	IDT	19	Manufacturer of pharmaceutical ingredients to international standards for major pharmaceutical groups.	-30.4%	-68.6%	\$0.08
LBT Innovations	LBT	19	Developer of innovative products which deliver productivity benefits across a range of life science settings	-25.6%	-49.6%	\$0.06
Adherium	ADR	19	Commercialising personal digital medication monitoring systems to improve patient compliance and medication efficacy	-42.9%	-63.6%	\$0.00
IMEXHS	IME	19	Markets a radiology and imaging platform, in Latin and South America, and uses SaaS and PaaS revenue models. (Completed 50:1 consolidation)	2.2%	-55.6%	\$0.46
Bluechiip	BCT	19	Development, manufacture and commercialisation of a tracking system for biological samples	14.8%	-36.7%	\$0.03
Neuroscientific Biopharm.	NSB	18	Developing EmtinB, an LRP-1 receptor agonist for the treatment of Alzheimer's disease	-30.6%	-62.7%	\$0.13

Bioshares Index (Cont'd)

Company	Code	Cap. \$m	Principal Activities	Change - Half	Change - Year	Price 31/12/22
Bio-Gene Technology	BGT	18	Commercialisation of the insecticides Flavocide (synthetic) and Qcide (plant-derived), in the fields of human health and crop protection.	-23.1%	-51.2%	\$0.10
Osteopore	OSX	18	Manufacture of 3D bioresorbable implants. Three products are FDA cleared and CE Marked for cranio-facial indications	30.4%	-33.3%	\$0.15
EZZ Life Science Holdings	EZZ	16	Distributor of skin care products (EAORON brand) and develops consumer health products for Au, NZ and China. (Listed Q2 2021)	21%	-26%	\$0.38
Bioxyne	BXN	16	Sale and distribution of probiotics	100.0%	-17.2%	\$0.02
Amplia Therapeutics	ATX	16	Developing drug candidates to treat fibrotic cancers and fibrosis. Formerly Innate Immunotherapeutics.	-16.7%	-51.5%	\$0.08
Arovella Therapeutics (Formerly Suda Pharm.)	ALA	15	Developing drugs for oro-mucosal administration. Recently acquired IP for anagrelide, with intent to develop it as an anti-cancer therapy	0.0%	-41.0%	\$0.02
Living Cell Technologies	LCT	15	Development of NTCELL for the treatment of Parkinson's Disease, and potentially for eye and ear diseases	50.0%	140.0%	\$0.01
Island Pharmaceuticals	ILA	15	A drug repurposing company that focuses on the development of antivirals for infectious diseases (Listed Q2 2021)	27.6%	-27.5%	\$0.19
Kazia Therapeutics	KZA	15	Developing GDC-084 for the treatment of glioblastoma multiform (a brain cancer)	-85.0%	-92.7%	\$0.09
Control Bionics	CBL	15	Design, manufacture and sale of wireless wearable electromyography (EMG) based augmentative and alternative communication (AAC) technology (Listed Dec 2020)	-26.7%	-61.2%	\$0.17
The Hydration Pharmaceutical Co.	HPC	15	Sells hydration liquids, powders and tablets in North America. Sold ANZ rights to Hydralyte in 2014 to Care Pharmaceuticals. (Listed Q4 2021)	-30.8%	-70.0%	\$0.09
Regeneus	RGS	15	Commercialisation of autologous adipose derived stem cells and factors. Markets HiQCell for human use and CryoShot for veterinary use.	-21.3%	-40.0%	\$0.05
Asian American Medical Group	AJJ	15	Manages liver treatment centres in Asia; expanding into radiation oncology	0.0%	0.0%	\$0.04
Truscreen	TRU	15	Commercialising cervical cancer screening device for real time detection of cancerous and pre-cancerous tissue (Listed Q1 2021)	-4.8%	-45.2%	\$0.04
Biome Australia	BIO	14	Develops and sells evidence-based complementary medicines, including probiotics, 10 at listing. (Listed Q4 2021)	-6.7%	-41.7%	\$0.07
Tissue Repair	TRP	14	Developing a biologically active pharmaceutical to stimulate wound repair pathways. Phase III trials to start in 2022. (Listed Q4 2021)	-8.0%	-57.8%	\$0.23
Memphasys	MEM	13	Developing a sperm separation technology, SpermSep	-65.0%	-84.9%	\$0.01
Adalta	1AD	13	Developing AD-214 for the treatment of idiopathic pulmonary fibrosis (IPF) and other human fibrotic diseases	-24.1%	-48.8%	\$0.04
BCAL Diagnostics	BDX	13	Developing an in vitro diagnostic for breast cancer using fingerprints of lipid biomarkers. (Listed Q3 2021)	-25%	-52%	\$0.06
Visioneering Technologies	VTI	13	Markets a next-generation contact lens (100:1 share consolidation)	50.9%	-54.3%	\$0.40
Singular Health Group	SHG	12	Developing medical imaging software (Listed Q1 2021)	19.8%	-58.9%	\$0.12
Allegra Orthopedics	AMT	11	A developer and manufacturer of prosthetic implants and medical devices.	-41.7%	-30.0%	\$0.11
IhaleRx (formerly Lifespot Health)	IRX	10	Commercialising the Bodytel diagnostic software, which is deployed with its Medihale medical cannabis vaporiser system, as well as with patients with metabolic syndrome	-20.0%	-33.3%	\$0.06
Lumos Diagnostics	LDX	10	Develops and sells POC diagnostics for inflammatory diseases and infections. Lead product, FebriDx, is a finger prick test to differentiate between bacterial & viral infection.	-66%	-95%	\$0.05

Bioshares Index (Cont'd)

Company	Code	Cap. \$m	Principal Activities	Change - Half	Change - Year	Price 31/12/22
Exopharm	EX1	9	Development of technology for improving the purification of exosomes, which are extra-cellular vesicles which transport bioactive molecules through out the body.	-53.8%	-88.5%	\$0.06
USCOM	UCM	9	Markets Uscom, a non-invasive heart output function monitor, BP+ non-invasive central blood pressure product and digital ultrasonic spirometry products	-30.8%	-60.9%	\$0.05
Nutritional Growth Solutions	NGS	9	Development and sale of nutritional supplements for children. (Listed Q4 2020)	-45.5%	-67.6%	\$0.06
Holista Colltech	HCT	8	Markets dietary supplements and disinfectant products	-6.5%	-38.3%	\$0.03
Total Brain	TTB	6	Development and commercialisation of functional brain analysis techniques.	-2.2%	-66.7%	\$0.05
Dorsavi	DVL	6	Commercialising a wireless sensor movement monitoring system and products for use in the Elite Sports, OH&S and medical/physiotherapy markets	0.0%	-40.0%	\$0.01
Anagenics (formerly Cellmid)	AN1	6	Health and beauty business focusing on sale of anti-aging and wellness products.	8.7%	-58.3%	\$0.03
Medibio	MEB	6	Commercialising a test for depression and anxiety	100.0%	-60.0%	\$0.002
HitIQ	HIQ	5	Develops and sells head impact mouthguards to assist in assessment of sport related concussion injuries (Listed Q2 2021)	-37.5%	-83.9%	\$0.03
Analytica	ALT	5	Markets the Pericoach product to aid in the management of female urinary incontinence.	0.0%	-50.0%	\$0.001
Anatara Life Sciences	ANR	4	Developing a gastrointestinal dietary supplement	-38.2%	-75.7%	\$0.03
Hexima	HXL	3	Developing HXP124 to treat fungal infection of toenails (Re-listed Q4 2020). Program cancelled due to poor results (July 2022).	-33.3%	-95.2%	\$0.02
Jayex Healthcare	JTL	3	Commercialisation of the Enlighten patient workflow platform	120%	-42%	\$0.01
TALI Digital	TD1	2	Software company developing tools for assessment and improvement of attention in children. Formerly Novita Healthcare.	-66.7%	-90.9%	\$0.00

Capitalisation Total **12,164**

Continued over

Botanical Product Companies (Cultivated Production)

Company	Code	Cap. \$m	Principal Activities	Change - Half	Change - Year	Price 31/12/22
Incannex	IHL	278	Developing medical cannabis products to treat OSA, TBI and ARDS and TMD	-16.7%	-72.0%	\$0.18
Cronos	CAU	326	Medicinal cannabis health and wellness business	134.0%	192.5%	\$0.59
Cann Group	CAN	79	Medicinal cannabis company focused on the breeding, cultivation and production stages. Holds Australian ODC cultivation (MC) and research license (CR). Acquired Satipharm in 2021.	-25.5%	-29.3%	\$0.21
Elixinol Global	EXL	89	A supplier of hemp and medicinal cannabis products. To Acquire CansaCare Health GmbH	51.4%	-17.6%	\$0.28
Little Green Pharna	LGP	47	Sale and distribution of medicinal cannabis products	-20.0%	-69.7%	\$0.18
Neurotech International	NTI	57	Has acquired proprietary cannabis strains for treating autism, epilepsy and ADHD	-1.4%	15.0%	\$0.07
Creso Pharma	CPH	37	Development of cannabis and hemp derived therapeutic, nutraceutical, and life style products with wide patient and consumer reach for human and animal health.	-42.9%	-75.6%	\$0.02
MGC Pharmaceuticals	MXC	31	A medical and cosmetic cannabis company with growing operations in Slovenia. Acquired Czech company Panax Pharma.	-31.3%	-70.3%	\$0.01
Althea Group	AGH	22	Supply of branded medicinal cannabis products in Australia. To cultivate, extract and manufacture medicinal cannabis. Holds ODC manufacturing license.	3.4%	-72.9%	\$0.06
Medlab Clinical	MDC	15	Development, production and marketing of nutraceuticals cannabis product to treat cancer patients with intractable pain	-6.9%	-70.2%	\$6.70
Auscans Group Holdings	AC8	18	Developing medical cannabis products for the Australian market. (Acquired CansPal Animal Therapeutics in 2021)	8.1%	-50.6%	\$0.04
Zelira Therapeutics	ZLD	10	Developer of medicinal cannabis therapeutic products (175 for 1 consolidation 1H 2022)	3.1%	-82.7%	\$1.00
Bod Australia	BOD	23	Developer and distributor of natural, evidence-based cosmetics and natural medicines. Holds medicinal cannabis import license. Overseas partner is Linsea SA.	114.3%	-37.5%	\$0.15
Epsilon Healthcare (Formerly named THC Global Group)	EPN	8	A diversified global cannabis company with operations in Australia and Canada	-7.4%	-64.8%	\$0.03
Fiji Kava	FIJ	4	Cultivation and development of kava (piper methysticum) as an alternative treatment for anxiety, pain and insomnia.	-55.9%	-80.8%	\$0.02
Cann Global	CGB	5	Operates a hemp seeds business and conducts medical cannabis research (25 for 1 share consolidation 2022)	5.0%	-58.0%	\$0.02

Capitalisation Total 1,048

Listed Biotech Investment Funds or Companies

Company	Code	Cap. \$m	Principal Activities	Change - Half	Change - Year	Price 31/12/22
BTC Health	BTC	10	Provides capital and management expertise to high-growth Australian biotech, medtech and pharmaceutical companies	-8%	-51%	\$0.04

Capitalisation Total 10

Capitalisation Total - All Indices 219,646

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, Opthea, ResApp Health, Pharmaxis, Dimerix, Adalta, Patrys, Antisense Therapeutics, Imugene, Chimeric Therapeutics, Neuren Pharmaceuticals, Neurotech International, Aroa Biosurgery, Radiopharm Theranostics, Imricor Medical Systems, Anteris Technologies

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