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Bioshares

29 December 2017

Edition 727

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

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)	-36%
Year 8 (May '08 - May '09)	-7.4%
Year 9 (May '09 - May '10)	50.2%
Year 10 (May '10 - May '11)	45.4%
Year 11 (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 - Current)	-1.7%
Cumulative Gain	746%
Av. Annual gain (14 yrs)	17.4%

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Quarterly Review

Bioshares Index Rebounds – Posts 11% Gain

The **Bioshares Index** posted a strong recovery in the December quarter, 2017, rising 10.6% from the previous quarter, overcoming negative sentiment which had pulled the index backwards in the September quarter.

We have created a new index, the **Bioshares MedCann Index**, so that trends in this fast-growing sub-sector can be monitored. This index increased by 53.4% in the quarter.

Bioshares MedCann Index includes companies which are developing medicinal cannabis products, as well as various non-medical products, originating from cultivated strains of cannabis. The 14 stock index includes Auscann Group, Algae.Tec, Bod Australia, CannPal Animal Therapeutics, Cann Group, Creso Pharma, eSense-Lab, Medlab Clinical, MMJ Phytotech, MGC Pharmaceuticals, Queensland Bauxite, The Hydroponics Company, TPI Enterprises and Zelda Therapeutics. (See page 13 for index details.)

What sets the three largest companies in the index – Auscann, Cann Group and TPI Enterprises – apart from the remaining eleven is that they have been successful in gaining one or more Australian Office of Drug Control licences to research, cultivate or manufacture medicinal cannabis extracts, with Auscann also gaining pharmaceutical manufacturing authorisation from the TGA.

The index does not include Botanix Pharmaceuticals, which is developing products using synthetic cannabidiol, and is developing products according to FDA standards.

The capitalisation the **Bioshares MedCann Index** at the close of the September quarter was \$1.5 billion.

The **Bioshares Large Cap Index** increased by 7.8% in the December quarter, a movement largely in line with the 6.9% increase in the ASX 300 Index.

Index Performance by Quarter (Change from previous Qtr)

	Q4 2016	Q1 2017*	Q2 2017	Q3 2017^	Q4 2017**
Bioshares Index	-7.7%	2.4%	-13.9%	-6.2%	10.6%
Bioshares Large Cap Index	-7.1%	19.1%	7.9%	-2.6%	7.8%
Bioshares MedCann Index					53.4%
Nasdaq Biotech Index^^	-8.4%	10.7%	5.7%	7.6%	-3.0%
ASX 300 Index	4.0%	3.4%	-2.4%	-0.6%	6.9%

**Medicinal Cannabis stocks moved from Bioshares Index to separate index

*MYX and SIP included in Bioshares Large Cap Index from Q1 2017

^SRX and SIP moved back to Bioshares Index

^NBI as of December 28

Bioshares Index – Top 10 Outperformers – Dec. Quarter

Company	Code	Cap. \$m	Change - Quarter	Change - Year	Price 29/12/17
Noxopharm	NOX	117	259%	169%	\$1.130
Botanix Pharmaceuticals	BOT	36	230%	50%	\$0.066
Bioxyne	BXN	59	217%	411%	\$0.092
Medigard	MGZ	3	114%	43%	\$0.030
Bluechiip	BCT	27	109%	109%	\$0.069
Neuren Pharmaceuticals	NEU	318	108%	186%	\$3.200
Polynovo	PNV	340	86%	79%	\$0.520
Genetic Technologies	GTG	32	86%	18%	\$0.013
Mach 7	M7T	35	69%	-29%	\$0.270
Clovercorp	CLV	121	64%	40%	\$0.730

Capital Raisings

Just under \$300 million was raised by ASX listed life science companies in the December quarter 2017, which was the most raised in any quarter of 2017. (Refer to the table on the next page for the complete list of raisings.)

IPOs contributed \$72 million, or 24%, of capital raised during the period.

The largest raising was conducted by medicinal cannabis outfit Cann Group, which increased its offering from \$48 million to \$58.7 million in order to cater for strong demand. A significant player in the Canadian medicinal cannabis market and investor in Cann Group, Aurora Cannabis (ACB:TO; C\$3.6 billion) increased its stake to 22.9% (from 19.9%), contributing an estimated \$18 million in the placement.

One of the drivers of demand for medicinal cannabis producers is expansion of capacity to meet an anticipated lift in demand for cannabis when the controls on recreational cannabis use are eased in Canada in July 2018.

A total of \$842 million was raised in 2017, compared to \$1,384 million raised in 2016. However, if the \$888 million raised by Mayne Pharma in 2016 is excluded, the current year's figure of \$842 million against an adjusted figure of \$496 million suggests that calendar year 2017 has been a bumper year for capital raisings.

Outperformers

The most successful performer in the Bioshares Index for the December quarter was Noxopharm, up 259%. Noxopharm is developing NOX66. The hypothesis for NOX66 is that it can enhance the response of tumours to radiotherapy and sensitise tumours to classic chemotherapies such as carboplatin.

The company has one Phase I study underway in Georgia and a Phase I brachytherapy sensitising study underway at St Vincent's Hospital, Sydney.

Botanix Pharmaceuticals locked in a 230% gain for the quarter, a reflection of timely progress on both the clinical and regulatory fronts. Following a Pre-IND meeting with the FDA for its acne drug BTX 1503, the FDA confirmed that the company's proposed

Bioshares Index - Top 10 Underperformers – Dec. Quarter

Company	Code	Cap. \$m	Change - Quarter	Change - Year	Price 29/12/17
Living Cell Technologies	LCT	15	-85%	-70%	\$0.027
Simavita	SVA	4	-50%	-83%	\$0.013
TBG Diagnostics	TDL	13	-45%	-66%	\$0.061
LBT Innovations	LBT	28	-41%	-47%	\$0.185
Scigen	SIE	17	-40%	76%	\$0.030
GI Dynamics	GID	16	-39%	22%	\$0.028
Antisense Therapeutics	ANP	4	-35%	-33%	\$0.024
Memphasys	MEM	9	-33%	-60%	\$0.002
Jayex Healthcare	JHL	2	-30%	-64%	\$0.016
AFT Pharmaceuticals	AFP	204	-29%	-21%	\$2.100

development plan was adequate to support a Phase II study. Botanix also initiated a trial of BTX 1204 in dermatitis and completed enrolment on its Phase Ib study of BTX 1503, which was started in August.

Shares in gut health company Bioxyne increased by 217% over the quarter on the back of strong results of a clinical trial run over six months in 61 patients of its Prograstrim product.

Minnow stock Medigard posted a 114% gain for the quarter. The company has attracted the attention of entrepreneur Dr Ian Dixon, who will be looking at ways that the company's syringe technology can be used to deliver acellular and synthetic biologically active materials to treat conditions such as macular degeneration.

Underperformers

Living Cell Technology's shares fell sharply during the quarter, by 85%, following the release of results from the company's trial of NTCELL in Parkinson's disease patients. At 26 weeks post-implant, no difference was found between the treatment arm and the control arm for changes in the Unified Parkinson's Disease Rating Scale.

The shares of incontinence management technology company Simavita weakened by 50% over the quarter. The company has been going through a difficult transition stage which has included a rebuild of its product offerings ('AlertPLUS'), a search for distributors and marketing partners, at the same time as managing costs in the business.

TBG Diagnostics shares fell by 45% over the quarter. The stock is very thinly traded. The company's top 20 shareholders account for nearly 90% of stock on issue, with Taiwan company Medigen Biotechnology holding a 49% stake. The company has a low visibility with the Australian investment market

Shares in LBT Innovations were pared back by 41% over the quarter, a response to the company's failure to secure, by year's end, one or more regional distributors for the company's current flagship product, APAS Independence.

Bioshares

Capital Raisings by Australian-listed Biotech Companies Q4 2017

Company	Code	Investment Manager or Investor	Type of Raising	Funds Raised (\$M)
Cann Group	CAN	Cannaccord Genuity / PAC Partners	Placement	\$58.7
Ellex Medical Lasers	ELX		Placement	\$23.0
Ellex Medical Lasers	ELX		SPP	\$0.58
Polynovo	PNV		SPP	\$16.0
Creso Pharmaceuticals	CPH	Everblu	Placement	\$15.5
Creso Pharmaceuticals	CPH	Energy Capital Partners	SPP	\$0.36
G Medical	GMV		Placement	\$13.5
Avita Medical	AVH	Bell Potter	Rights Issue	\$12.4
Brain Resource Company	BRC	Bell Potter / Gleneagle Securities	Placement	\$10.1
Medadvisor	MDR	EBOS	Placement	\$9.5
The Hydroponics Company	THC		Placement	\$8.0
Oventus	OVN	Bell Potter	Placement	\$7.6
Imugene	IMU		Placement	\$6.7
Paradigm Biopharm.	PAR	Baker Young / Morgans Corporate	Placement	\$5.8
Neurotech International	NTI	Azure Capital	Placement	\$4.0
Memphasys	MEM	Paterson Securities	Rights Issue	\$0.7
Memphasys	MEM	Paterson Securities	Convertible Note	\$0.3
Memphasys	MEM	Paterson Securities	Placement	\$2.9
Rhinomed	RNO	Bell Potter	Placement	\$3.6
Optiscan Imaging	OIL	Paterson Securities	SPP	\$2.5
Optiscan Imaging	OIL		Placement	\$1.0
Phosphagenics	POH		Rights Issue	\$3.4
Bod Australia	BDA	Taylor Collison	Placement	\$3.2
LBT Innovations	LBT	Autobio	Placement	\$2.0
Mach 7 Technologies	M7T	Oceania Capital	Placement	\$2.0
Pharmaust	PAA	Argonaut Securities	Placement	\$1.9
Uscom	UCM	Steven Meng	Placement	\$1.8
eSense Health	ESE	MMJ Phytotech	Placement	\$1.6
Algae.Tec	AEB		Rights Issue (Shortfall)	\$1.6
Invitroque	IVQ		Placement	\$1.5
Orthocell	OCC	Shaw & Partners	Placement	\$1.5
Simavita	SVA		Convertible Note	\$1.4
Analytica	ALT		Rights Issue	\$1.3
Cellmid	CDY	Dennis Eck	Placement	\$1.0
Allegra Orthopaedics	AMT		Placement (T2)	\$0.5
Mediguard	MGZ		Placement	\$0.3
Rhythm Biosciences	RHY	Taylor Collison	IPO	\$9.0
CannPal Animal	CP1	Merchant Group	IPO	\$6.0
Bio-Gene Technologies	BGT	Henslow	IPO	\$7.2
Telix Pharmaceuticals	TLX	Taylor Collison / Wilsons	IPO	\$50.0
Total raised in Q4 2017				\$299.8
Total raised in Q3 2017				\$126.6
Total raised in Q2 2017				\$225.2
Total raised in Q1 2017				\$188.7
Total raised YTD 2017				\$840.4

Progress With Little or No Reward – Nine Biotechs that Delivered in 2017

Although 2017 was a good year for the broader market in Australia in 2017, with the ASX300 up 7.2% for the year, the Nasdaq Biotech Index up by 22.2% for the same period, and Australian medicinal cannabis companies up by 54% in the fourth quarter alone, it was tough work for many of the more 'traditional' biotech stocks in Australia, even on the back of excellent progress.

Pharmaxis was down 8.9%, even though Boehringer Ingelheim started two Phase II trials with the compound acquired from it, which triggered milestone payments of €28 million. Somnomed was down 6.4% after achieving revenue growth of 18.8% for the last quarter and 12% for the last financial year, while opening 12 sleep treatment centres in the US. AirXpanders' share price fell, surprisingly, by 38%, even though sales have been gaining excel-

Cont'd on page 12

Company	Share price 31/12/16	Share price 29/12/17	% Ch.	Progress in 2017
Pharmaxis	\$0.28	\$0.255	-8.9%	Boehringer starts Phase IIa trial in NASH - €18M payment to PXS
				Boehringer starts Phase IIa trial in diabetic retinopathy - €10M payment to PXS
				Primary endpoint met in Phase III trial in cystic fibrosis, although effect lower than previous
				Commenced two Phase I trials for LOXL2 program
Somnomed	\$3.89	\$3.64	-6.4%	Opened 12 sleep treatment centres in USA
				Revenue growth for FY2017 of 12%
				Revenue growth for Q1 FY2018 of 18.8%
AirXpanders	\$1.17	\$0.725	-38.0%	Sales in Q1 FY2018 US\$1.2M, up 640% on pcp
				Raised \$45M at 92cps
				Arranged US\$15M debt facility
Visioneering Technologies*	\$0.40	\$0.55	37.5%	VTI lens reduced Myopia progression by 96% in children
				Sales in Q3 CY2017 US\$0.34M, up 416% on pcp
				528 optometrists using product (up from 95 in pcp)
Nanosonics	\$3.11	\$2.77	-10.9%	Full year revenue up 58% to \$67.5M
				Operating profit before tax of \$13.9M (up from \$0.136M in pcp)
Rhinomed	\$0.19	\$0.13	-31.6%	Walgreens increased stocking from 1000 stores to 4300 stores in USA
				150,000 units shipped in FY2017
				Store presence over 7,000, from 3,000 in pcp
				Revenue up 70% to \$1.7M in FY2017
Opthea	\$0.85	\$0.70	-17.2%	Successful Phase I/II trial in wet AMD
				Raised \$45M at 93 cps
				Key patent granted in USA to provide exclusivity to 2034
				Phase IIb trial in wet AMD commenced
Viralytics**	\$1.19	\$0.69	-42.0%	64% BORR with Keytruda (CAPRA study), compared to 33% for Keytruda
				57% BORR with Yervoy (MITCI study), compared to 11% for Yervoy
				Only 11% Grade 3 or higher SAEs with combination. In Yervoy monotherapy trial, 52% of patients stopped treatment.
				Lung cancer: 30% overall response with Keytruda (Keynote200) compared to 19% for Keytruda
				Bladder cancer: 28% overall response with Keytruda (Keynote200) compared to 21% for Keytruda
Clinuvel Pharm.	\$7.45	\$8.19	9.9%	\$16.7M revenue for FY2017
				Inaugural profit of \$7.1M for FY2017
				Reimbursement & pricing secured in Germany, Austria, Netherlands, Italy and Switzerland (all but one insurer)
				Achieved consistent pricing for Scenesse of €56,404 for annual treatment (4 implants)
				Received knockback from NICE (UK) for reimbursement of Scenesse

* Listing price in March

** Comparisons are from published data on Yervoy and Keytruda in separate trials

Bioshares Model Portfolio (29 December 2017)							Portfolio Changes – 29 December 2017
Company	Code	Price (current)	Price added to portfolio	Recommendation	Cap'n (\$M)	Date added	
Clinuvel Pharmaceuticals	CUV	\$8.19	\$4.15	Spec Buy A	\$391	December 2014	IN: No changes OUT: No changes
Somnomed	SOM	\$3.69	\$0.94	Buy	\$217	January 2011	
AirXpanders	AXP	\$0.725	\$0.745	Spec Buy A	\$209	September 2015	
Bionomics	BNO	\$0.385	\$0.295	Spec Buy A	\$186	March 2016	
Viralytics	VLA	\$0.690	\$0.300	Spec Buy B	\$166	August 2013	
Opthea	OPT	\$0.700	\$0.160	Spec Buy A	\$140	November 2014	
Osprey Medical	OSP	\$0.410	\$0.695	Spec Buy B	\$139	September 2015	
Visioneering Technologies	VTI	\$0.550	\$0.435	Spec Buy A	\$108	March 2017	
Volpara Health Technologies	VHT	\$0.700	\$0.375	Spec Hold A	\$102	June 2017	
Pharmaxis	PXS	\$0.255	\$0.260	Spec Buy A	\$82	December 2016	
MediBio	MEB	\$0.345	\$0.395	Spec Buy A	\$69	September 2017	
Micro-X	MX1	\$0.43	\$0.38	Spec Buy A	\$62	May 2017	
Dorsavi	DVL	\$0.300	\$0.480	Spec Buy B	\$50	December 2016	
Adalta	1AD	\$0.250	\$0.23	Spec Buy A	\$25	July 2017	
AcruX	ACR	\$0.150	\$0.31	Spec Buy A	\$25	July 2017	
Adherium	ADR	\$0.100	\$0.495	Spec Buy A	\$17	May 2016	
Rhinomed	RNO	\$0.130	\$0.320	Spec Buy B	\$12	December 2015	

Selected Clinical Trial Developments - Q4 2017

Company	Code	Product/Therapeutic	Event
AFT Pharmaceuticals	AFP	Maxigesic IV (paracetamol 1000mg and ibuprofen 300mg)	Reported stat sig difference between treatment groups for 276 pts who had had bunion surgery. SPID; p<0.001.
Botanix Pharmaceuticals	BOT	BTX1503 (synthetic cannabidiol) (acne)	Completed enrolment in 20 pt, Phase Ib study, in pts with acne, with treatment administered over a four week period
Bioxyne	BXN	Prograstrim (PCC - lactobacillus fermentum VRI-003)	Completed double-blind, randomised, placebo-controlled trial in 61 pts, dosed daily over 6 months. Statistically significant results reported for 7 outcomes concerning gastro-intestinal and bowel health and anti-biotic consumption.
Bionomics	BNO	BNC101 (metastatic colorectal cancer)	Completed recruitment in Phase I trial of BNC101 in an open label multi-centre study. 21 subjects. Reported recommended dose for Phase II trial of 15mg/kg.
Cynata Therapeutics	CYP	CYP-001 (allogenic, induced pluripotent stem cell-derived mesenchymal stem cell) (GVHD)	Reported dosing of 8th pt in 16 pt Phase I study, who will have had a bone marrow transplant or similar procedure
Factor Therapeutics	FTT	VF001-DP (wound healing, venous leg ulcers)	Reported 50% recruitment reached in 168 pt trial
Immuron	IMC	IMM-124E (NASH)	Completed enrollment of 133 pts with biopsy proven NASH. Topline results to be released Q1 2018.
Mesoblast	MSB	MSC-100-IV (allogeneic mesenchymal stem cells) (steroid refractory acute graft versus host disease)	Completed enrollment in Phase III trial. 50 pediatric subjects. Topline results to be released Q1 2018.
Oncosil Medical	OSL	Oncosil (targeted radioactive isotope - Phosphorus32) (pancreatic cancer)	Announced 18 subjects implanted, of 23 recruited. Reported "excellent local disease control - of 100% at week 8 and 90% at week 16. No SAEs.
Paradigm Biopharmaceuticals	PAR	Pentosan Polysulphate Sodium (PPS) (bone marrow lesions)	Met primary endpoint of safety and tolerability in open label Phase IIa trial. 11 pts. Met 2nd EP of statistically sig reduction in BML as measured by MRI.
Paradigm Biopharmaceuticals	PAR	Pentosan Polysulphate Sodium (PPS) (knee osteoarthritis)	Commenced randomised, double blind, placebo controlled Phase IIb trial. 100 subjects.
Pharmaxis	PXS	PXS-5338 (Nonalcoholic steatohepatitis (NASH))	Commenced Phase I study. (PK, PD, safety). Healthy adult males. 14 days.
Pharmaxis	PXS	PXS-5382 (Idiopathic Pulmonary Fibrosis, NASH, Liver & Kidney Fibrosis)	Commenced Phase I study. Randomised, double-blind, placebo controlled, dose escalating study in healthy adult males. 6 cohorts, 8 pts = 48 pts total
ResApp Health	RAP	ResAppDx (smartphone application for the diagnosis and management of	In adult subjects with COPD and chronic asthma, reported 87-89% sensitivity and 87-90% specificity compared to lung function test

The ASX-Listed Life Sciences Sector

December 29, 2017: Capitalisation \$107 billion, 140 companies

Bioshares Large Cap. Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 29/12/17
CSL	CSL	63,906	Manufactures pharmaceutical products including vaccines and human plasma fractions	5%	41%	\$141.30
Resmed Inc.	RMD	15,624	Manufactures diagnostic and treatment equipment for sleeping disordered breathing	13%	28%	\$10.99
Cochlear	COH	9,854	Manufactures cochlear hearing implants	8%	40%	\$171.23
Blackmores	BKL	2,914	Manufactures vitamin, mineral and herbal supplements and skin & hair products in Australia and N.Z.	43%	64%	\$169.17
Mayne Pharma Group	MYX	1,071	Manufactures, develops and markets generic drugs, with operations in Australia and the USA	5%	-48%	\$0.695

Capitalisation Total 93,369

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 29/12/17
Sigma Pharmaceuticals	SIG	1051	Pharmaceutical manufacturing and wholesaling	20%	-23%	\$0.990
Sirtex Medical	SRX	921	Sale and manufacture of radioactive particles to irradiate tumours in the liver	24%	17%	\$16.520
API	API	830	Pharmaceutical wholesaler	13%	-18%	\$1.685
Nanosonics	NAN	829	Developing a novel disinfection technology, the first product is a point of care ultrasound probe disinfection unit, branded Trophon EPR	6%	-11%	\$2.770
Mesoblast	MSB	687	Developing cellular medicines based on its proprietary mesenchymal lineage adult stem cells for high, unmet medical needs including advanced heart failure, chronic low back pain, acute graft versus host disease and inflammatory conditions such as biologic refractory rheumatoid arthritis.	7%	2%	\$1.460
Starpharma Holdings	SPL	504	Developer of pharmaceutical chemical scaffolds known as 'dendrimers'	7%	88%	\$1.360
Medical Developments	MVP	423	Commercialising the Pentrox inhaler for temporary pain relief. Used widely in ambulances across Australia.	38%	62%	\$7.150
Clinuvel Pharmaceuticals	CUV	391	Markets an analogue of the alpha-MSH protein, named Scenesse, as a photo-protective agent. Approved in Europe.	22%	10%	\$8.190
Impedimed	IPD	384	Markets products that aid the diagnosis of secondary lymphoedema, muscle wasting and other disorders	28%	-1%	\$1.015
Polynovo	PNV	340	Developing novel polymer-based products for treating wounds and burns	86%	79%	\$0.520
Neuren Pharmaceuticals	NEU	318	Developing neuroprotective therapeutics. Completed 1:20 share consolidation.	108%	186%	\$3.200

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 29/12/17
Reva Medical	RVA	280	Developing the Fantom scaffold, its third version of a bioresorbable coronary stent	-9%	-38%	\$0.680
Somnomed	SOM	214	Markets oral devices for the treatment of sleep apnea and snoring.	-5%	-6%	\$3.640
AirXpanders	AXP	209	Design, manufacture and distributor of the Aeroform, a patient controlled tissue expander, for use in breast reconstruction after mastectomy	-6%	-38%	\$0.725
AFT Pharmaceuticals	AFP	204	Development and sale of pharmaceuticals in Australasia and Rest-of-World	-29%	-21%	\$2.100
Bionomics	BNO	186	Developing drugs to treat cancer and CNS diseases, and has also developed a gene diagnostic for epilepsy.	-19%	17%	\$0.385
Viralytics	VLA	166	Developing a cancer treatment based on the application of viruses (oncolytic virus technology)	-15%	-42%	\$0.690
Opthea	OPT	140	Developing OPT-302 to treat wet AMD (an eye disease)	-3%	-17%	\$0.700
Osprey Medical	OSP	139	Markets DYEVERT, a device which reduces the amount of dye needed in imaging procedures	-2%	-11%	\$0.410
Ellex Medical Lasers	ELX	139	Develops, manufactures and markets solid state ophthalmic lasers used to treat secondary cataracts and retinal disorders.	-11%	-31%	\$0.965
G Medical	GMV	131	Developing next generation mobile health and e-health devices, and cloud and medical call centres	-10%		\$0.385
Telix Pharmaceuticals	TLX	122	Development of molecularly-targeted radiation (MTR) therapies and diagnostics	-5%		\$0.620
Clovercorp	CLV	121	Development and production of omega-3 food additives from tuna oil	64%	40%	\$0.730
Noxopharm	NOX	117	Developing a cancer treatment, NOX66, a formulation of idronoxil, which targets NADH oxidase 2.	259%	169%	\$1.130
Visioneering Technologies	VTI	108	Markets a next-generation contact lens	34%		\$0.550
Volpara	VHT	102	Markets breast density assessment tools and analytics, for use with breast X-ray screening programs	40%	10%	\$0.700
Cogstate	CGS	102	Markets cognitive performance diagnostic products	-5%	-27%	\$0.890
Anatara Life Sciences	ANR	85	Developing a natural antibiotic for the animal production industries	32%	65%	\$1.730
Phylogica	PYC	85	Developing peptide compound libraries for use in human therapeutics	0%	60%	\$0.040
Pharmaxis	PXS	82	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.	-4%	-9%	\$0.255

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 29/12/17
Oncosil Medical	OSL	76	Developing Oncosil, a brachytherapy for pancreatic cancer and liver cancer	35%	80%	\$0.155
Admedus	AHZ	75	Diversified medical products group. Markets Cardioceel, a bio-scaffold and is also developing a HSV-2 vaccine.	13%	-18%	\$0.295
Compumedics	CMP	74	Develops, manufactures and markets sleep diagnostic and monitoring equipment.	15%	-52%	\$0.420
SDI	SDI	72	Manufacture & distribution of amalgam (fillings) & other dental materials and product R&D	5%	-18%	\$0.605
OBJ	OBJ	71	Developing transdermal drug delivery technologies	3%	-42%	\$0.040
Medibio	MEB	69	Commercialising a test for depression and anxiety	-22%	-10%	\$0.345
Cyclopharm	CYC	65	A nuclear medicine company that markets the Technegas lung imaging system	27%	4%	\$0.950
Avita Medical	AVH	64	Markets ReCell, a skin repair product	-5%	-48%	\$0.063
Medadvisor	MDR	63	Medication adherence software platform company	37%	37%	\$0.048
Micro-X	MX1	62	Development of a mobile medical x-ray imager for hospitals, a version for deployed military use and a mobile security back-scatter imager	6%	-11%	\$0.430
Bioxyne	BXN	59	Sale and distribution of probiotics	217%	411%	\$0.092
Oventus	OVN	59	Developing an oral appliance to treat sleep apnea and snoring	46%	-16%	\$0.555
pSiVida	PVA	57	Developing drug delivery technologies, with a special focus on ophthalmic applications	-7%	-44%	\$1.450
Cynata Therapeutics	CYP	56	Stem cell technology company aiming to produce unlimited uniform, pharmaceutical grade MSCs from a single donor.	-5%	-15%	\$0.620
Probiotec	PBP	55	Manufacturer, marketer and distributor of a range of over the counter (OTC) pharmaceuticals, complementary medicines and speciality ingredients	61%	80%	\$0.900
Immutep	IMM	53	Development immuno-oncology drug candidates IMP761 and IMP321 (eftilagimod alpha)	-15%	-39%	\$0.022
Universal Biosensors	UBI	53	Development, manufacture and commercialisation of a range of in vitro diagnostic tests for point-of-care use	-19%	-3%	\$0.300
ResApp Health	RAP	51	Developing digital healthcare solutions to diagnose and manage respiratory conditions	16%	-79%	\$0.078
Dorsavi	DVL	50	Commercialising a wireless sensor movement monitoring system and products for use in the Elite Sports, OH&S and medical/physiotherapy markets	5%	-44%	\$0.300

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 29/12/17
Vita Life Sciences	VLS	43	Development, manufacture and distribution of prescription and OTC medicines as well as complementary and alternative medicines, dietary supplements and health foods	-18%	-40%	\$0.775
Imugene	IMU	43	Developing a Her2 positive cancer vaccine technology	0%	-21%	\$0.015
Optiscan Imaging	OIL	43	Manufactures confocal microscopes for clinical diagnosis	0%	67%	\$0.100
Benitec Biopharma	BLT	41	R&D company focusing on gene silencing, specifically DNA delivered RNAi technology	43%	82%	\$0.200
ITL Health Group	ITD	40	Divested custom pack business. Now operates a DTC pathology test business, MyHealthTest and ITL BioMedical, which manufactures devices for clinical, laboratory and blood	19%	38%	\$0.470
Invitroque	IVQ	39	Singapore-based analytical services company (life sciences). Listed through BUN.	-6%	-14%	\$0.080
Prana Biotechnology	PBT	38	Developing drugs to treat CNS diseases such as Alzheimer's and Parkinson's	27%	54%	\$0.071
Factor Therapeutics	FTT	37	Developing VF-001, for the treatment of venous leg ulcers and potentially to treat ocular conditions	-9%	-25%	\$0.051
Orthocell	OCC	36	Developing and marketing regenerative medicine products	11%	-11%	\$0.340
Botanix Pharmaceuticals	BOT	36	Developing BTX1503 for the treatment of acne. BTX1503 combines synthetic cannabidiol with a transdermal drug delivery system, Permetrex.	230%	50%	\$0.066
Mach 7 Technologies	M7T	35	Development and sales enterprise imaging management platform	69%	-29%	\$0.270
Paradigm Biopharm.	PAR	34	Development of existing approved drug, pentosan polysulphate sodium to treat bone marrow oedema and allergic rhinitis	-10%	-28%	\$0.280
Genetic Signatures	GSS	34	Development and sale of molecular diagnostics(MDx) kits and products	-17%	-28%	\$0.325
Genetic Technologies	GTG	32	Markets Brevagen, a breast cancer risk prediction tool	86%	18%	\$0.013
Vectus Biosystems	VBS	32	Developing an anti-fibrotic compound, VB0004, with applications in heart and kidney disease	8%	-7%	\$1.350
Brain Resource Corp	BRC	31	Development and commercialisation of functional brain analysis techniques	0%	-40%	\$0.060
Alcidion	ALC	30	Markets a health informatics platform, which incorporates an intelligent EMR, clinical decision support engine, data Integration capability, smartforms, terminology support and	-6%	-44%	\$0.049
Asian American Medical Group	AJJ	30	Manages liver treatment centres in Asia; expanding into radiation oncology	-5%	-17%	\$0.100
Cellmid	CDY	29	Develops and markets therapies and diagnostic tests for fibrotic diseases, cancer, ischemic diseases of the heart and hair loss. Completed 1:20 share consolidation.	2%	-2%	\$0.510

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 29/12/17
Actinogen Medical	ACW	29	Developing Xanamem for the treatment of dementia in Alzheimer's disease patients	-27%	-43%	\$0.041
Race Oncology	RAC	29	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.	29%	132%	\$0.440
USCOM	UCM	29	Markets Uscom, a non-invasive heart output function monitor, BP+ non-invasive central blood pressure product and digital ultrasonic spirometry products	24%	-14%	\$0.210
Rhythm Biosciences	RHY	28	Developing Colostat, a blood test for the early detection of colorectal cancer	40%		\$0.280
LBT Innovations	LBT	28	Developer of innovative products which deliver productivity benefits across a range of life science settings	-41%	-47%	\$0.185
Bluechiip	BCT	27	Development, manufacture and commercialisation of a tracking system for biological samples	109%	109%	\$0.069
Regeneus	RGS	26	Commercialisation of autologous adipose derived stem cells and factors. Markets HiQCell for human use and CryoShot for veterinary use.	-17%	-24%	\$0.125
Adalta	1AD	25	Developing AD-114 for the treatment of idiopathic pulmonary fibrosis (IPF) and other human fibrotic diseases	11%	47%	\$0.250
Invion	IVX	25	Development of Photosoft, a photosensitiser derived from chlorophyll, which it is believed can accumulate selectively in tumours and be manipulated for therapeutic purposes.	20%	200%	\$0.006
Acrux	ACR	25	Developer of topical generic drugs	3%	-52%	\$0.150
Bio-Gene Technology	BGT	25	Commercialisation of the insecticides Flavocide (synthetic) and Qcide (plant-derived), in the fields of human health and crop protection.	-3%		\$0.195
Immuron	IMC	25	Sales and development of hyper-immune bovine colostrum products for therapeutic use	12%	-30%	\$0.190
Phosphagenics	POH	23	Commercialising a platform technology (alpha-tocopherol) , for human and animal applications.	20%	-38%	\$0.018
IDT Australia	IDT	23	Manufacturer of pharmaceutical ingredients to international standards for major pharmaceutical groups.	8%	-50%	\$0.090
Imagion Biosystems	IBX	22	Developing MagSense, a diagnostic technology which exploits the principles of superparamagnetic relaxometry	-15%		\$0.110
Neurotech International	NTI	22	Development and sales of Mente (and platform), a treatment for improving behaviours of people with autism and other neurological conditions	-20%		\$0.200
Kazia Therapeutics	KZA	22	Formerly Novogen. Developing GDC-084 for the treatment of glioblastoma multiform (a brain cancer). Completed 1:10 consolidation.	13%	-46%	\$0.450
Genera Biosystems	GBI	21	Develops, manufactures and distributes advanced molecular diagnostic tests, with a particular focus on women's health.	48%	-26%	\$0.200
Suda Pharmaceuticals	SUD	20	Developing drugs for oro-mucosal administration	-24%	-20%	\$0.016
Respiri	RSH	19	Respiratory and pulmonary devices company. Markets Airsonea, an ehealth product.	26%	5%	\$0.044

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 29/12/17
Anteo Diagnostics	ADO	18	Developer of a biological coatings technology that can be applied to immunoassays, bio-separations, drug delivery and other medical devices	14%	-61%	\$0.016
Adherium	ADR	17	Commercialising the Smartinhaler range of devices that attach to prescription third-party inhalers, which improve compliance and efficacy	-23%	-58%	\$0.100
Dimerix	DXB	17	Developing a combination therapy, DMX200, to treat chronic kidney disease. Completed 1:20 share consolidation.	-11%	-22%	\$0.125
Sienna Cancer Diagnostics	SDX	17	Development and sale of an in vitro diagnostic, SCD-A7, as an adjunct to urine cytology, in the field of bladder cancer detection and diagnosis	-21%		\$0.110
Patrys	PAB	17	Currently evaluating strategic collaborations and other complementary assets. Recently inlicensed two nucleus-penetrating antibodies, Deoxymabs 3E10 and 5C6	15%	283%	\$0.023
StemCell United	SCU	17	Applies a proprietary stem cell technology to culture and grow plant extracts for use in Traditional Chinese Medicine. Intends to cooperate with iCAN Israel Cannabis.	60%	186%	\$0.040
Scigen	SIE	17	Singapore based developer and manufacturer of biopharmaceuticals, including human growth hormone, human insulin and human GCSF	-40%	76%	\$0.030
Holista Colltech	HCT	16	Extracts collagen from sheepskins and markets natural healthcare products.	-13%	-12%	\$0.087
Proteomics International	PIQ	16	Provider of protein chemistry analytical services. Seeking to commercialise a diabetic kidney disease diagnostic.	35%	8%	\$0.270
Novita Healthcare	NHL	16	Design and development of training exercises that target core issues in early childhood and academic skills. Acquired Newly, and online matching marketplace which connects	38%	63%	\$0.044
GI Dynamics	GID	16	Commercialising the Endobarrier, an implantable polymer liner for the management of obesity and diabetes	-39%	22%	\$0.028
Living Cell Technologies	LCT	15	Development of NTCELL for the treatment of Parkinson's Disease, and potentially for eye and ear diseases.	-85%	-70%	\$0.027
Rhinomed	RNO	15	Developing nasal technologies with applications for sport performance, sleep and drug delivery	-19%	-32%	\$0.130
Recce	RCE	15	Development of an antibiotic ("RECCE") as a cancer treatment	-13%	3%	\$0.170
Prescient Therapeutics	PTX	14	Developing compounds to treat various cancers	14%	-22%	\$0.067
Analytica	ALT	14	Markets the Pericoach product to aid in the management of female urinary incontinence. Has appointed advisor to sell Pericoach and Autoburette and possibly the company.	0%	0%	\$0.005
Allegra Orthopeadics	AMT	14	A developer and manufacturer of prosthetic implants and medical devices.	-7%	-7%	\$0.140
TBG Diagnostics	TDL	13	Development of HLA SSA and SBT diagnostic kits and related services	-45%	-66%	\$0.061
RHS	RHS	13	Markets the pre-implantation IVF screening kit, EmbryoCollect	0%	43%	\$0.140

Bioshares Index

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 29/12/17
PharmAust	PAA	12	Manages Epichem, a drug discovery business. Also developing a veterinary anti-parasitic compound (PPL-1) as a human and animal cancer therapy.	20%	3%	\$0.060
Biotron	BIT	11	Developing compounds to treat HCV and HIV	53%	-26%	\$0.029
Lifespot Health	LSH	11	Acquired Lifespot AG, which has been developing a system for the diagnosis and evaluation of skin diseases, and BodyTel AG, which has been developing a system for the management, diagnosis and evaluation of chronic disease	8%		\$0.140
Atcor Medical	ACG	10	Markets the SphygmoCor device, a noninvasive technology that provides information regarding the functioning of the cardiovascular system	28%	-47%	\$0.037
Resonance Health	RHT	9	Marketing the FerriScan technology, a non-invasive tool for measuring liver iron levels	16%	-15%	\$0.022
Memphasys	MEM	9	Developing a sperm separation technology, SpermSep. Formerly NuSep.	-33%	-60%	\$0.002
Innate Immuno-therapeutics	IIL	7	Assessing its options following the failure of MIS416 in a Phase II clinical trial	-15%	-97%	\$0.028
Cryosite	CTE	6	Provides specialised storage services, especially for umbilical cord blood	-4%	-38%	\$0.125
BARD1 Life Sciences	BD1	5	Developing cancer diagnostics and therapies. Lead program is the BARD1 lung cancer test. Acquired Swiss company BARD1AG.	-13%	-79%	\$0.007
Simavita	SVA	4	Commercialising an instrumented incontinence assessment device	-50%	-83%	\$0.013
Antisense Therapeutics	ANP	4	Developing antisense compounds to treat multiple sclerosis and Duchenne Muscular Dystrophy	-35%	-33%	\$0.024
Medigard	MGZ	3	Developed retractable syringe technology and other safety medical products.	114%	43%	\$0.030
Jayex Healthcare	JHL	2	Commercialisation of the Enlighten patient workflow platform	-30%	-64%	\$0.016

Capitalisation Total **12,157**

– Cont'd from page 4

lent traction, with PCP growth of 640% in the September quarter.

Nanosonics was down 10.9% on the back of 58% revenue growth in FY2017 to \$67.5 million and a profit of \$13.9 million. Rhinomed was down 31.6% with its store presence increasing from 3,000 to over 7,000. Opthea was down 17.2% after positive Phase I/II trial results and raising \$45 million. And Viralytics was down 42% even with continued positive clinical trial news flow.

Contact lens company Visioneering Technologies had a late run with

its share price up 37.5%. This followed strong quarterly sales growth during the year, strong adoption by optometrists, and published data that down a dramatic 96% reduction in myopia progression in children. Clinuvel Pharmaceuticals achieved a small gain over the year of 9.9% after recording an inaugural profit of \$7.1 million.

One stock that did respond well to positive clinical news flow was Starpharma Holdings, which increased by 88% on the back of Phase III data for the prevention of bacterial vaginosis with its drug candidate VivaGel.

Bioshares

Medicinal Cannabis Companies (Cultivated Production)

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 29/12/17
Cann Group	CAN	361	Medicinal cannabis company focused on the breeding, cultivation and production stages. Holds Australian ODC cultivation (MC) and research license (CR).	130%		\$2.740
Auscann Group Holdings	AC8	217	Developing medical cannabis products for the Australian market. Holds Australian ODC cultivation (MC) and manufacture license and TGA manufacture license.	74%		\$0.800
TPI Enterprises	TPE	178	Licensed poppy producer. Narcotic raw material processor. Holds Australian ODC cultivation (MC) and research license (CR).	-23%		\$2.200
Medlab Clinical	MDC	141	Development, production and marketing of nutraceuticals. Also developing cannabis product to treat cancer patients with intractable pain.	9%	-8%	\$0.780
Creso Pharma	CPH	101	A developer of medical cannabis therapies. Headquartered in Zug, Switzerland. Acquired Hemp Industries, which grows hemp in Slovakia.	79%	291%	\$0.920
MMJ Phytotech	MMJ	92	Developing medical cannabis products for the Canadian market	32%	98%	\$0.435
MGC Pharmaceuticals	MXC	91	A medical and cosmetic cannabis company with growing operations in Slovenia. Acquired Czech company Panax Pharma.	123%	107%	\$0.089
Queensland Bauxite	QBL	86	Holds 55% stake in Medical Cannabis Ltd	338%		\$0.057
The Hydroponics Co.	THC	79	A medicinal cannabis company formed through the acquisition of Candeo, an off-shoot of Agri Fibre Industries	152%		\$0.680
Zelda Therapeutics	ZLD	70	A medical cannabis company researching treatments for cancer, dermatological indications and for sleep disorders	35%	138%	\$0.093
Bod Australia	BDA	22	Developer and distributor of natural, evidence-based cosmetics and natural medicines. Holds medicinal cannabis import license. Overseas partner is Linnea SA.	271%		\$0.390
eSense Health	ESE	21	Specialises in phytochemical profiling of plants to develop and reverse engineer terpenes for medical and other applications	11%		\$0.300
CannPal Animal Therap.	CP1	19	Research and development of cannabis-based therapeutics for companion animals	0%		\$0.200
Algae.Tec	AEB	16	Investor in Uruguayan company Biogenics. Has applied to the Australian ODC to cultivate and produce medicinal cannabis	-11%		\$0.024

1,496

Listed Biotech Investment Funds or Companies

Company	Code	Cap. \$m	Principal Activities	Change - Quarter	Change - Year	Price 29/12/17
BTC Health	BTC	31	Provides capital and management expertise to high-growth Australian biotech, medtech and pharmaceutical companies	23%	11%	\$0.240

Capitalisation Total 31**Capitalisation Total - All Indices** 107,052

How Bioshares Rates Stocks

For the purpose of valuation, Bioshares divides biotech stocks into two categories. The first group are stocks with existing positive cash flows or close to producing positive cash flows. The second group are stocks without near term positive cash flows, history of losses, or at early stages of commercialisation. In this second group, which are essentially speculative propositions, Bioshares grades them according to relative risk within that group, to better reflect the very large spread of risk within those stocks. For both groups, the rating “Take Profits” means that investors may re-weight their holding by selling between 25%-75% of a stock.

Group A

Stocks with existing positive cash flows or close to producing positive cash flows.

- Buy** CMP is 20% < Fair Value
- Accumulate** CMP is 10% < Fair Value
- Hold** Value = CMP
- Lighten** CMP is 10% > Fair Value
- Sell** CMP is 20% > Fair Value
(CMP–Current Market Price)

Group B

Stocks without near term positive cash flows, history of losses, or at early stages commercialisation.

Speculative Buy – Class A

These stocks will have more than one technology, product or investment in development, with perhaps those same technologies offering multiple opportunities. These features, coupled to the presence of alliances, partnerships and scientific advisory boards, indicate the stock is relative less risky than other biotech stocks.

Speculative Buy – Class B

These stocks may have more than one product or opportunity, and may even be close to market. However, they are likely to be lacking in several key areas. For example, their cash position is weak, or management or board may need strengthening.

Speculative Buy – Class C

These stocks generally have one product in development and lack many external validation features.

Speculative Hold – Class A or B or C

Sell

Corporate Subscribers: Cogstate, Bionomics, Impedimed, LBT Innovations*, Viralytics, Opthea, RHS, Innate Immunotherapeutics, Anantara Life Sciences, ResApp, Pharmaxis, Starpharma, Dimerix, Cyclopharm, Adalta, Immuron, Medibio, Phylogica, Pharmaust
*LBT was inadvertently deleted from this list from edition 688 onwards

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