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Companies covered: ACR, ADR, BNO, PXS

	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)	-6.6%
Cumulative Gain	**703%**
Av. Annual gain (14 yrs)	**17.1%**

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Bioshares

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

Extract from Bioshares –

Pharmaxis – Boehringer Selects Diabetic Retinopathy As Second Indication

The drug candidate, BI 1467335, first developed by Pharmaxis (PXS: $0.29) and sold to Boehringer Ingelheim in 2015, has been moved into a second Phase II trial, for the treatment of diabetic retinopathy. The advance triggers a €10 million ($15 million) milestone payment to Pharmaxis upon dosing of the first patient.

The commencement of another Phase IIa trial was announced last month by Boehringer in the liver disease NASH (non-alcoholic steatohepatitis).

BI 1467335 acts as an anti-inflammatory agent. Inflammation was not previously thought to play a role in diabetic retinopathy because it was thought that the immune system did not act in the retina.

However, in recent years evidence has shown that chronic, subclinical inflammation is occurring in the retina in patients with this disease. Edema and neovascularisation which occurs in patients with diabetic retinopathy, are indicators of the inflammatory nature of this disease.

Addressing diabetic retinopathy through the treatment with BI 1467335 ties in well with Boehringer's strong presence in the diabetes treatment market.

Boehringer has an active program in R&D in diabetes, has at least three internally developed drugs on the market – Jentadeuto, Jardiance and Glyxambi – and has a global strategic alliance with Eli Lilly, with Boehringer co-marketing the insulin drugs Synjardy and Basaglar.

Pharmaxis CEO Gary Phillips said that the decision by Boehringer to progress the compound into a second Phase II trial underlines the confidence Boehringer has in the compound and is a perfect fit given its large franchise in diabetes.

Trial Design

This trial will seek to enrol 100 patients with moderately severe to severe non-proliferative diabetic retinopathy. Patients will be treated for 12 weeks with a 12-week follow-up period. The trial has not yet commenced recruitment. Data from the trial is due to be received by the end of August next year.

The primary endpoint in the trial is the number of patients with any adverse ocular events from natural progression of the disease, presumably such as retinal bleeding.

A secondary endpoint is any improvement in the eye being treated. The study will include a placebo arm and will involve daily oral treatment with BI 1467335.

Cont'd over

Both Phase IIa trials in NASH and diabetic retinopathy are expected to readout next year.

Summary

Pharmaxis stands to receive potential additional milestone payments of up to €362 million from the Boehringer deal for moving into Phase III studies and regulatory and pricing approvals, as well as a high single digit proportion of sales and some sales-based milestone payments. Once the diabetic retinopathy milestone payment is received, Pharmaxis will have received $83 million from Boehringer Ingelheim for the BI 1467335 compound.

Institutional investors, both local and overseas, have been increasing their ownership of Pharmaxis. BVF Partners from the US, a high-profile biotech investor, has moved to just under a 20% stake, and Australian Ethical Investment has moved to a 10% position. Allan Gray, which was an early investor in the company, has reduced its stake to 8%.

Pharmaxis is capitalised at $93 million. We estimate the company will finish CY2017 with around $54 million in cash.

Bioshares recommendation: **Speculative Buy Class A**

Correction: Note the forward cash estimate of $54 million in the last edition of Bioshares should have referred to the end of 2017, not 2018.

Bioshares

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, Viralytics, Opthea, RHS, Innate Immunotherapeutics, Anatara Life Sciences, ResApp, Pharmaxis, Starpharma, Dimerix, Cyclopharm, Adalta, Immuron, Medibio, Phylogica