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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 - Current)	-2.1%
Cumulative Gain	1581%
Av. Annual gain (21 yrs)	19.0%

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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 Repurposes PXS-4728 for Parkinson's Disease**

Since Boehringer Ingelheim returned the Pharmaxis (PXS: \$0.076) drug candidate PXS-4728 in 2020, Pharmaxis has been seeking to find a new indication to trial for the compound, given the level of development work that had been carried out on the compound by Boehringer.

From the licensing deal for the compound, Pharmaxis received \$83 million in payments from Boehringer. However, Pharmaxis CEO Gary Phillips believes that Boehringer has also spent around \$100 million in development costs, including nine clinical studies with six and nine month toxicology studies, as well as manufacturing around 200kg of product for clinical studies that did not proceed.

One of the reasons for Boehringer discontinuing development of the drug candidate was its off-target effect in inhibiting the enzyme MAO-B in the brain. However, MAO-B breaks down chemicals in the brain, including dopamine, and the rationale is that by inhibiting MAO-B the presence of dopamine can be extended in the brain. This potentially gives the drug candidate an application in slowing down the progression of Parkinson's disease.

PXS-4728 is primarily an inhibitor of the inflammatory enzyme SSAO and it is believed that the compound may have a dual action as a disease modifying drug in Parkinson's disease, and potentially in other neurodegenerative diseases such as Alzheimer's disease according to Phillips. There are currently no disease modifying treatments for Parkinson's disease available.

Pharmaxis' Parkinson's program will be mostly funded by the charity Parkinson's UK, which will provide around \$5 million to the program. The proposed Phase II study, which will be placebo-controlled, will seek to recruit around 40 patients who will be treated for 12 weeks. It is expected to cost \$5.8 million.

In around 50% of people who develop Parkinson's disease, the precursor in symptoms is what's termed 'isolated Rapid Eye Movement Sleep Behaviour Disorder' or iRBD. Pharmaxis will seek to recruit patients with iRBD in Sydney and the UK in a study that is expected to start early next year and be completed in the first half of 2024.

The primary endpoint in the study will be changes in microglia volume in the brain with secondary endpoints including the impact on sleep parameters. The program is supported by positive findings from preclinical neuroinflammation models in the brain conducted at the University of Sydney as well as published data in Parkinson's research.

*Continued over*

The University of Sydney and the University of Oxford will be collaborating in the study, with Parkinson's UK presumably assisting with marketing of the study to disease specialists. It's a commercial deal with Parkinson's UK, which will then be entitled to up to four times its initial funding from future sales royalties.

### Summary

Targeting MAO-B to stop or reduce the breakdown of dopamine using PXS-4728 is a promising approach to tackling Parkinson's disease. The approach has already received the support of disease specialists at the University of Sydney and the University of Oxford as well as the commercial support of Parkinson's UK.

For Pharmaxis it gives the company a third drug candidate in its pipeline, adding to PXS-5505 for the treatment of myelofibrosis (currently in a Phase IIa study) and PXS-6302 for the topical treatment of scars. Interim data is due from the myelofibrosis study this year. But perhaps of more importance will be final data from the PXS-6302 scar treatment study, also due this year. A Phase Ic study in liver cancer with PXS-5505 is expected to start next quarter.

Pharmaxis is capitalised at \$42 million. Positive results from clinical studies this year have the potential for strong gains in this stock. The company has a solid share register with specialist funds including BVF Partners (San Francisco) and Karst Peak Capital (Hong Kong / Sydney).

*Bioshares* recommendation: **Speculative Buy Class A**

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**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**

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