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In this edition...
Patrys has signalled that the next and arguably most important step of the commercialisation of its human antibody technology is about to take place. This is the start of a Phase I trial of PAT-SM6 in melanoma patients. Interim data may be available in the second half of 2010.
Neuren Pharmaceuticals is starting a trial of NNZ-2566 in patients with traumatic brain injury. That this trial is being funded by the US Army gives some appeal to an investment in Neuren.
Protein separations technology company Flourotechnics closed a rights issue this week. This company has the potential to capture revenues in the protein research market with an innovative approach to protein separations.

The Editors
Companies Covered: FLS, NEU, PAB

	Bioshares Portfolio
Year 1 (May '01 - May '02)	21.2%
Year 2 (May '02 - May '03)	-9.4%
Year 3 (May '03 - May '04)	70.0%
Year 4 (May '04 - May '05)	-16.3%
Year 5 (May '05 - May '06)	77.8%
Year 6 (May '06 - May '07)	17.3%
Year 7 (May '07 - May '08)	-36%
Year 8 (May '08 - May '09)	-7.3%
Year 9 (May '09 - May '10)	49.2%
Year 10 (May '10 - Current)	-2.0%
Cumulative Gain	**184%**
Av Annual Gain (9 yrs)	**18.5%**

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Bioshares

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

Patrys – Watch this Stock

Patrys (PAB: 12 cents) will be a stock to look out for in the coming 12 months. Having completed the preclinical work on its lead compound, PAT-SM6, and having completed manufacturing of this compound, which is a major hurdle for antibody drugs and particularly for natural human antibody drugs which have not previously been manufactured on a commercial scale, the company is now set to start its first clinical trial in Australia.

This week the company announced it had successfully completed the first milestone in its collaboration with **CSL** which was formed in January this year. The company will receive its first milestone payment, which although not disclosed, should be visible in the company's quarterly cash flow statement in July.

Most antibody drugs on the market are either mouse antibodies, or antibodies that have been modified to look more human, called humanised antibodies. Patrys' core technology finds natural human antibodies in the blood that exist to protect people from the ongoing risk of cancer. Having now established methods to make this drug for commercial production (for clinical trial amounts at this stage), the company is now ready to begin clinical investigation.

Human Antibody Drugs Start to Yield Positive Results

It comes at a time when interest in human antibody drugs seems to be accelerating and this approach is gaining acceptance from clinical success by other groups. In a Phase II study conducted by US group **Nascent Biologics** in 66 patients with brain cancer, that company's human antibody achieved a 70% five year survival compared to around 3% that has historically been the case.

In another case, a natural human antibody drug from **Kenta Biotech** achieved a 100% survival in critically ill patients with pneumonia, where historically a 24% mortality can be expected, according to Patrys.

This data follows on from positive clinical results received with Patrys' PAT-SC1 in earlier clinical studies in gastric cancer.

Expands Offering to IGG Antibodies

Patrys has developed two core assets. These have been the natural human antibodies it has found that have shown preclinical activity against cancer cells. From these antibodies it has also, in cases, found novel targets that these antibodies interact with, itself a potentially highly valuable asset.

– Cont'd over

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Neuren Pharmaceuticals – Back For Another Shot

It's time to reconsider Neuren Pharmaceuticals. In 2008, Neuren's Phase III clinical trial of Glypromate failed to achieve a significantly statistical result, bringing to an end that program. Glypromate, failed not specifically because it wasn't effective, but that efficacy could not be shown because the patient population selected did not display the cognitive decline in patients following heart surgery that was expected and that Glypromate was meant to prevent.

The company's then second program which has become its lead, a compound called NNZ-2566, has now moved into a 260 patient Phase II study for the treatment of traumatic brain injuries. NNZ-2566 is a synthetic analogue of Glypromate.

This clinical program has been funded by the US Army. In July last year the US Army indicated it would provide an additional US$14 million to fund this Phase II study, which brings to a total US$18.7 million that the US Army has provided in funds to develop this drug candidate.

There are two things that make this program of interest to investors. Firstly, it is the leading and only TBI program that the US Army is funding for clinical development, having selected it from around 100 proposals. Secondly, NNZ2566 has been tested in around 40 animal models that have confirmed the compound's potential in preventing neurological damage after a traumatic brain injury, all with statistical significance.

The Phase II trial commenced earlier this month. It is designed in such a way that should clearly indicate whether the compound is worth progressing into a Phase III program, where only one pivotal study should be needed.

Trial Design

The trial will examine three different treatment groups. Each patient will need to start treatment within eight hours following injury. A 20mg/kg infusion of the drug will be delivered for 10 minutes immediately. Then a maintenance dose of three different doses will be delivered to the patients, these being either 1mg/kg, 3mg/kg or 6mg/kg every hour for 72 hours. Each of these treatment arms will be compared with an infusion and maintenance dose of a saline solution placebo.

Each arm will be divided proportionally with two thirds of patients with moderate TBI and one third with severe TBI. The primary endpoint is safety, with efficacy a secondary endpoint.

The trial appears to be well designed with the US Army taking on a large role in the trial design and selection of sites. The trial should deliver very clear information on any benefit that NNZ2566 may provide to TBI patients, although it is not powered for statistical significance, which will be the aim of a single Phase III study should this trial be successful. Currently two of the 12 sites (in California and Florida) are recruiting patients. The company will look to add up to five more back-up sites if needed, potentially adding sites in Canada, New Zealand and Australia.

The trial will also allow the company to look at the effect of the drug if taken sooner rather than later in the eight hour window following injury. All centres in the trial have patients taken to hospital by helicopter if they are located more than 10 minutes drive from the hospital, which should help deliver treatment earlier. The company believes that the neurological (damage) processes start to occur after 24 hours, which places the eight hour post damage treatment window as conservative.

To date 76 people have received this drug without serious adverse events in Phase I studies, with only transient dizziness and injection site reactions. Those injection site reactions should now be reduced with the pH of the drug increased from an acidic level to a neutral point.

– Cont'd over

– Patrys...from page 1

The company is now offering IGM antibodies to partners. Patrys' antibodies are in the form of IGM antibodies, which work by activating what is called 'complement'. However, the company can modify these antibodies into IGGs, which work through activation of T-cells. All anticancer antibodies that have been approved are IGG type antibodies so this option helps complete the product offer to potential partners.

Phase I Trial Ready to Start

Patrys is now ready to begin a Phase I study in Australia in patients with melanoma. In preclinical studies the compound, PAT-SM6 has shown to bind to 100% of all melanoma tumours tested and has shown to be effective at killing melanoma cells. The trial will take 12 months to complete although early patient data is expected in the second half of this year.

In the next 12 months, a Phase II study of PAT-SC1, which has previously achieved positive clinical results, will move back into clinical studies, once the drug is produced in its now established manufacturing platform. The third most advanced antibody, PAT-LM1, should also be ready for clinical evaluation in 2011.

Patrys is capitalised at $22 million and had $8.5 million in cash at the end of March.

Bioshares recommendation: **Speculative Buy Class A**

Bioshares

– Neuren cont'd

Other measures to be included will be blood biomarkers, including novel biomarkers developed by the US Army. The company will also monitor for seizures, and will conduct brain wave tests before during and four days after treatment. The end point for the trial will be at 90 days after injury/treatment.

The trial is expected to be completed by the end of 2011, with data out in early 2012. It's unclear at this stage whether there will be any interim results. We believe this could occur only if a clear patient benefit is noticed by clinicians without un-blinding the data. The company will move straight to a single pivotal study (500-600 patients) if results are positive. Only one study would be required to gain approval given there are no existing treatment options.

Market Opportunity

The company estimates the market for the treatment of TBI is worth approximately US$300 million a year in the US alone. The US Army will have the right to purchase the drug should it gain approval, for the lowest commercial selling price in any region.

Mechanism of Action

The company believes NNZ2566 works in two ways. The first is in blocking the up-regulation of neuro-inflammatory cytokines. The second mechanism is by blocking the activation of pro-apoptotic gene expression. Initial trauma causes an average damage to brain cells in the order of 20%, which is immediate and can not be protected against. The remaining 80% of brain damage is believed to be from a secondary effect (which starts around 24 hours after injury). This secondary damage is what NNZ2566 is expected to prevent occurring.

Neurological damage as a result of a trauma is believed to be caused from three processes: necrosis, apoptosis and neuro-inflammation. Neuren believes that its drug inhibits the latter two of these biological processes following injury.

The company has conducted extensive PK studies in small and large animal models. It has found that its compound readily crosses the blood-brain barrier, with equilibrium established between the CSF and the blood stream within 15 minutes, and also crossing into brain tissue.

Second Program - Motiva

As part of Neuren's acquisition of Hamilton Pharmaceuticals in October 2007, it picked up the Motiva program. Motiva is a compound that had been tested in Phase II studies (in over 1700 people in total) but did not achieve sufficiently positive results due to poor patient selection.

Neuren will shortly begin another Phase II trial in Perth that has been funded by an NHMRC grant. Perth has been selected because one of the world's experts on the treatment of apathy following stroke is based there. The trial, in 122 patients, will be conducted at the Fremantle and Royal Perth Hospitals. Results from this study are expected also in early 2012.

Patents

For NNZ2566, Neuren has a composition of matter patent that runs out to 2023 and a new use patent that if granted will give protection out to 2030. There is no composition of matter patent around the Motiva compound although use patents have been granted and pending giving protection out to at least 2019.

Convertible Note

In November last year Neuren arranged funding through a Convertible Note arrangement with **Spring Tree Special Opportunities Fund**. The Note provides funding of up to US$6.7 million with at least $2.7 million being a minimum draw down. Of this amount $1.35 million has been drawn down by Neuren. A further $100,000 will be drawn down each month which will be reduced to $60,000 per month towards the end of this year.

Spring Tree has the right to convert its loan into shares at the lower of 90% of the lowest of the VWAPs for 20 days prior to converting, or at 4.8 cents per share. .

This funding mechanism places a downward pressure on the company's share price, with the stock down 35% from when the convertible note was taken. This can benefit longer term investors who can acquire stock at low prices, however it places a downward selling pressure on the share price until the convertible note facility expires in November 2011. This assumes the Spring Tree fund is selling down its shares upon conversion, which appears to be the case with the group not registered currently as a substantial shareholder (more than 5% ownership).

Summary

A wealth of information from the Phase II NNZ2566 study should give clear information on whether NNZ2566 has any effect in limiting damage following a traumatic brain injury. The company has positioned itself well to give it two shots on goal in early 2012 when results from the two Phase II studies will be released.

Outside of the trials, which are largely funded by grants, the company has a low burn rate of only $100,000 per month, which is matched by the convertible note facility. At the end of March, the company had NZ$2.15 million in cash, excluding grant funds held for clinical trial expenses (NZ$855,000).

Neuren has a low capitalisation of only $10 million. Success in the NNZ2566 trials could see the company approach a value in the order of $200 million in 2012. The main concern for investors is that of slow recruitment in the NNZ2566 trial, with NNZ2566 being the key asset for the company.

Investors may also need to be patient with this stock, with close to a two year wait until clinical results appear. Also the downward pressure on the company's share price from its convertible note arrangement should be acknowledged.

Bioshares recommendation: **Speculative Accumulate Class B**

Bioshares

Fluorotechnics' HPE – An Innovation for the Protein Science Lab

Fluorotechnics (FLS: 15 cents) sells products and consumables into the life science research market. The company has adopted 'thegelcompany' as its global trading name and brand, but retains Flourotechnics as the parent company name. Flourotechnics acquired US-based the Gel Company in 2008 and the Germany-based Gelcompany GmbH (formerly Elecktrophesis-Technik GmbH (ETC)) in 2007.

Fluorotechnics Business Model

FLS sells a wide range of internally developed and third party products to research scientists, including proteomics, genomics and cell biology research tools. In this way, the company serves as a catalogue business to scientists, who can shop from the one company portal for most of their equipment and reagent needs in the tool-kit sub-set of gel based separation technologies.

The High Performance Electrophoresis (HPE) System

Perhaps foremost amongst the company's products is its 'horizontal' electrophoresis tower and associated gels. Its High Performance Electrophoresis (HPE) tower offers a number of improvements over conventional vertical electrophoresis units.

Electrophoresis is a method used to separate and detect proteins in a sample. The purpose of protein separation is to enable the latter step of identification. Many different mass spectrometry techniques have been developed to address the identification task.

Firstly, proteins are separated by charge on an electric gradient. Negatively charged proteins are attracted to one end, and vice versa. This is done using an isoelectric point gradient strip at the top of polyacrylamide gels. Once separated by charge the proteins than are separated at 90 degrees 'down' the gel according to mass.

The HPE includes a number of significant innovations that offer protein scientists efficiencies, costs savings and increased detection performance in separations.

It is important to remember that electrophoresis is an electrical method which results in the generation of heat, so much so that vertical systems contain anywhere between 5 and 25 litres of buffer (liquid) to protect the polyacrylamide gels which also have been placed in glass cassettes.

Heat management feature

In the HPE system the gel is not placed in a tank of liquid, although a small amount of buffer is used, about 160 ml of buffer per large gel (this buffer is added on the gel edges where wicks are situated.) Instead the gel is laid horizontally on a cooling plate. The cooling plate, an aluminium oxide ceramic, is a key design feature since it has permits the operation of separations at higher voltages. Water is pumped through the cooling plates.

Increased electric field strength means gels can be run more quickly. It can also increase the ability to separate more difficult to find (also called low abundant proteins) in a sample. Flourotechnics claims a 15% improvement in this regard.

Flexible design

The HPE system is designed with four trays, which can be contrasted with some vertical systems that can take up to six cassettes. However, each tray is not limited to running a single gel, and can in fact take up to three smaller gels per tray.

Increased runs

By eliminating glass and large quantities of buffer, FLS has reduced the overall running time of gel separation activity, indicating that a doubling from one a day to two a day is achievable. Technicians do not have to fill or empty the tank or clean the glass cassettes. (Technicians also do not have to cast gels.) There is a physical convenience to this, since the emptying of 25 litres of buffer could be regarded as demanding for even the average person.

Film backed gels

The HPE system also connects improvements with the gels themselves. FLS's gels are plastic backed which are thinner (0.65mm) than conventional gels (1.00mm). Gels are often made by scientists themselves (these are called 'homebrew' gels in the industry). However, homebrew gels can have a floppy quality and are subject to variability. This gives rise to problems in latter stages of research when gels need to be compared with others, since homebrew gels can look bent or waved. And other problems arise when proteins need to be picked out for analysis. This is much harder from a 'wavy' surface than a flat one.

Higher resolution

The thinner FLS gels also mean that protein spots exhibit higher resolutions and are more concentrated to a lesser depth, which gives improvement to the quantity that can be obtained in a spot picking process.

The advantage of FLS's plastic backed gels is that they are much lighter than commercial glass backed gels and have a longer shelf life of at least one year compared to three months for glass backed gels.

Trench

Another design feature of the FLS horizontal system is the use of a trench to run the isolectrical point gradient (IPG) strip, which is used in the first separation run of the all the proteins in a sample. Vertical gels utilise an IPG strip at the top of each gel. A trench system moves the IPG out of the gel construction, with the consequence that the chemistry of the gel can be altered so that separations can run faster, the shelf life of the gel is longer and the detection rates are improved.

The HPE system addresses a perennial problem for scientists, which is the time it takes to run an experiment.

The Protein Research Market

Protein research has not reached levels of automation and digitization that DNA has achieved. This is because proteins are larger and far more complex molecules which exist in complex and dynamic environments, not forgetting that there can be hundreds

Bioshares Model Portfolio (28 May 2010)

Company	Price (current)	Price added to portfolio	Date added
Biota Holdings	$1.11	$1.09	May 2010
Tissue Therapies	$0.17	$0.21	January 2010
Biodiem	$0.11	$0.15	October 2009
QRxPharma	$1.15	$0.25	December 2008
Hexima	$0.29	$0.60	October 2008
Atcor Medical	$0.14	$0.10	October 2008
CathRx	$0.19	$0.70	October 2008
Impedimed	$0.62	$0.70	August 2008
Mesoblast	$1.94	$1.25	August 2008
Circadian Technologies	$0.65	$1.03	February 2008
Patrys	$0.12	$0.50	December 2007
Bionomics	$0.33	$0.42	December 2007
Cogstate	$0.26	$0.13	November 2007
Sirtex Medical	$4.80	$3.90	October 2007
Clinuvel Pharmaceuticals	$0.23	$0.66	September 2007
Starpharma Holdings	$0.54	$0.37	August 2007
Pharmaxis	$3.08	$3.15	August 2007
Universal Biosensors	$1.38	$1.23	June 2007
Probiotec	$1.30	$1.12	February 2007
Acrux	$1.96	$0.83	November 2004
Alchemia	$0.55	$0.67	May 2004

Portfolio Changes – 28 May 2010

IN:
No changes.

OUT:
No changes.

– Flourotechnics cont'd

of proteins contained in a biological sample. Iso-electric charge based separations are likely to continue as a basic tool for researchers for some time (although it is not the only method available with for example, liquid chromatography being another). However, a benefit of 2 D gel separations is that the process supplies a visual presentation (a 2D array) of proteins in a sample, which can be exploited in different ways, including adding image analysis steps, to which are applied a whole other set of staining technologies e.g. Flourotechnics Lavapurple and Lavablue stains..

Protein research is not confined to human medical research but extends out into microbiology, plant sciences and even environmental sciences.

Investment Rationale

The most likely end game for an investment in FLS is that the company is acquired by a much larger multinational life sciences toolkit company such as **BioRad** or **GE Lifesciences** (a GE business built through the acquisition of **Amersham** in 2003).

The concept of acquisition of small company aggregation is a familiar concept across many industries. What Flourotechnics is doing as an aggregator agent of micro-companies is to globalise and professionalise the merged businesses by installing information systems, introduce ISO standards and formalise corporate SOPs among other things. Equal with product innovation and invention, the maturation of a set of discrete cottage businesses into an entity that can understand and consistently meet customer expectations is essential to the longer term objective of building a business that could be sold, *if so desired*, to a larger multinational that has lost market share to a strongly competitive but smaller firm.

Management Changes

In March 2009, FLS switched its CFO, James Walker into the CEO role and moved founder and CEO Duncan Veal into the Chief Technology Officer role. Veal has the key task of managing operations at the company's facilities in Tubingen in Germany. Veal is tasked with elevating those operations to higher standards of business performance, with a great deal of attention paid to quality control. Product innovation also takes place at Tubingen, with some new products anticipated that should help build the gelcompany brand (for example, products that enable the separation of native form proteins).

Summary

The sales and profits expectation that Flourotechnics set at its IPO in 2008 were extinguished by the GFC. However, the company's business model is sound and it has a strong technology base with which to build a very competitive business. Flourotechnics' main challenge is to build a reputable life sciences brand, using a variety of innovative products, not only the flagship HPE. However, brand building is a process that takes time as customers move from trying new equipment to accepting the equipment supplier as a trusted source.

Following the company's recent rights issue that sought to raise up to $2.2 million, the indicative capitalisation of the company is $7.6 million.

Bioshares recommendation: **Speculative Buy Class B**

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.

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

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