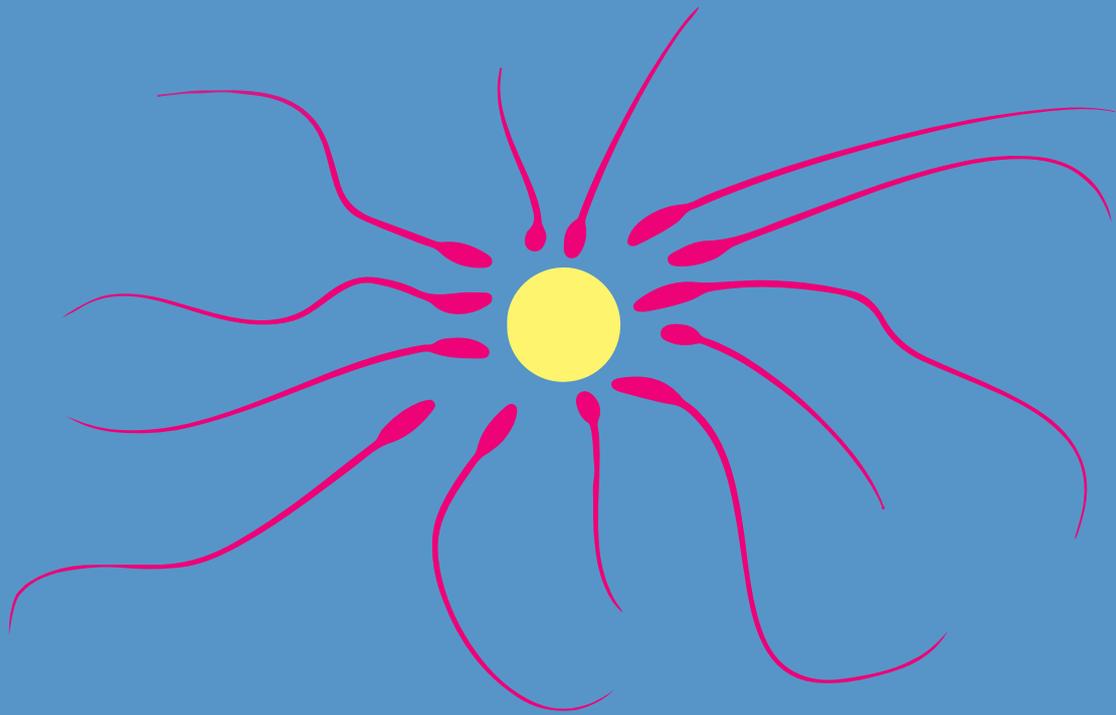


Engender Technologies Limited

Using light to separate female and male bearing sperm cells for the dairy industry



Information Memorandum

Confidential and Proprietary 6 June 2014

*An offer to raise funds of up to NZ \$1,250,000
through the issue of new shares of
Engender Technologies Limited*

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In particular, the Company’s expectations regarding the commercialisation of the technologies could be affected by, among other things, technical and engineering problems; unexpected regulatory actions or delays; competition in general; industry, and general public pricing pressures; and additional factors that involve significant risks and uncertainties about our products, financial results and business prospects. Should one or more of these risks or uncertainties materialise, or should underlying assumptions prove incorrect, actual results may vary materially from those described herein as anticipated, believed, estimated or expected. Engender is providing this information as of the date of this document and does not assume any obligation to update any forward-looking statements contained in this document as a result of new information, future events or developments or otherwise.

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Additional Information

Additional Information is also available under confidentiality for inspection by prospective investors in a due diligence document set from Engender.

Executive Summary

Addressing an unmet need in the livestock industry

There is an unmet market need in the international animal breeding industry for an affordable and effective sperm sex sorting product. Engender is developing technology that can separate female and male bearing bull sperm cells at low cost and without damage to the cells. Sex sorting will accelerate genetic gain and improve cost efficiencies in large animal reproduction.

Engender uses micro-fluidic chips that are expected to sort sperm by sex at lower cost and with less impact on fertility than previously possible. The initial target is the dairy industry. Engender seeks \$1,250,000 for 50% of the Company to combine its proven processes, currently in separate devices, onto one microfluidic chip and to commercialise the process.

Current sex sorting uses flow cytometry.¹ Shear force and to some degree high electrostatic fields reduce the viability of the sorted sperm using current flow activated cell sorting methods.² Engender's technology is a sort-on-a-chip approach with integrated microfluidic and photonic components. The new design is expected to achieve high efficiency and high accuracy sperm sex sorting with maximum viability (fertility). The chip based approach is expected to allow for highly parallel processing to achieve high throughput at low cost. The new chip and device is also expected to be more cost efficient, as the equipment required for the current technology costs hundreds of thousands of dollars.³

1. Flow cytometry is a laser-based, biophysical technology employed in cell counting, cell sorting, biomarker detection and protein engineering, by suspending cells in a stream of fluid and passing them by an electronic detection apparatus.

2. De Vries, 2012.

3. Ibid

Provisional patent has been filed

A US provisional patent application has been filed which claims light deflection of cells including sperm cells to achieve sex separation. The patent application includes details of the proposed design as well as a set of characteristics based on calculations and specialised knowledge of microfluidic chips. A search has been performed by the in-house patent lawyer at Auckland UniServices Limited (UniServices) that has not found any patent application or other prior art that would invalidate patenting the new microfluidics technology. The fact that no such prior art, including interfering patents, exists is strongly suggestive that the idea is sufficiently novel to be inventive, which is a key test for patentability.

Multi-billion dollar addressable market

The Organization for Economic Cooperation and Development (OECD) market for artificial insemination (AI) is estimated at ~US\$2.4 billion (dairy 65 %, beef 10 % and swine 25 %).⁴ The New Zealand market is predominantly dairy AI and is estimated at ~NZ\$60 million.⁵

Presently, all major North American AI companies⁶ have a Sexing Technologies (ST) laboratory or use a nearby ST facility to sex sort semen. ST holds the licence for the only existing commercial process to sort sperm for gender, which uses flow cytometry. ST's high price and lower fertility outcomes mean that since its introduction in 2003, the US market has grown slowly to an estimated ~300,000 semen straws per month.

Engender believes, based on discussion with various AI companies, that the market for sexed semen would increase dramatically if a product were available for a moderate premium to unsexed material and with a minimal diminution of fertility.

The global pig AI market is circa US\$600 million. There is no commercial gender selection product at present. Gender selection would be highly desirable as females are superior at converting feed to meat and have a preferred flavor profile. Engender estimates that if its sorting technology allowed semen sexing to become economically viable in the pig industry it is reasonable to expect a US\$50 million industry to emerge within five years. This estimate is based on the uptake in dairy of sexed semen from its commercial introduction in 2003 to sales of ~US\$50 million by the beginning of 2008.

Engender believes it has the skills, the scientific insight and the people to develop a sex separation system at low cost and high sperm viability as required by both New Zealand dairy farmers, global dairy farmers and potentially the swine industry.

Improving results and affordability of unsexed and sexed bovine semen

The flow cytometry based sexing technology reliably shows the ability to select X-bearing sperm at greater than 90 % purity. However, the high capital and operating cost of flow cytometer devices and their use results in sperm that is ~4x the average cost of unsexed sperm and has 20-25 % lower fertility even on heifers. Thus, despite the advantages of sexed sperm, the growth in the sexed sperm market has been slow due to the cost and lowered fertility.⁷ Should the Engender system be commercially proven it will significantly increase the viability and reduce the cost of sexed sperm allowing for widespread uptake. US academic Professor George Siedel has estimated that for the US alone, use of sexed semen would be worth US\$23-67 per dose to dairy producers.⁸

People

Mr Brent Ogilvie, Director, co-founder and shareholder in the Company, is part-time CEO. Mr Ogilvie provides extensive life sciences commercial experience and an invaluable collegial network of international affiliates in the ag-biotech market, especially in North America, Europe and North Asia. Pacific Channel and the principals of its US affiliate, The Channel Group, LLC have several decades of experience in the life sciences market including the management and eventual sale of the world's largest manufacturer of bovine serum albumin.

Dr. Cather Simpson has a joint appointment in the School of Chemical Sciences, and is the Director of the Photon Factory and Associate Director of the Dan Walls Centre for Pure and Applied Optics at the University of Auckland. She has expertise in photochemistry and photophysics. As a director of the Photon Factory, she manages micro to nano-fabrication facilities that can machine microscopic features in virtually any material.

4. Microbix, 2012.

5. LIC states that 73 % of NZ's herd or approximately ~ 3.2 million cows receive AI ,

6. Five companies do 95 percent of the collecting and distributing of bull semen in the U.S. They are Wisconsin-based ABS Global, Alta Genetics, Cooperative Resources International and Accelerated Genetics, and Plain City, Ohio-based Select Sires Inc.

7. Analysis drawn from De Vries, 2012

8. Siedel 2011. Assumes a heifer calf price of \$180-\$380 and a 60 % conception rate for unsexed semen.

Technology

Background

Sorting sperm by sex is a challenge, as the sexual dimorphism of sperm is very small. Male- and female-bearing sperm exhibit very similar characteristics of motility, swimming speed, size, density, shape, surface protein description, and other physical and chemical characteristics. Any inter-sex differences are so small that they are overwhelmed by the width of the distribution for each sex. The most reliable sorting tag is the amount of DNA in the male sperm differs from that in the female by a few percent.

Achievement to date

Outcomes achieved to date:

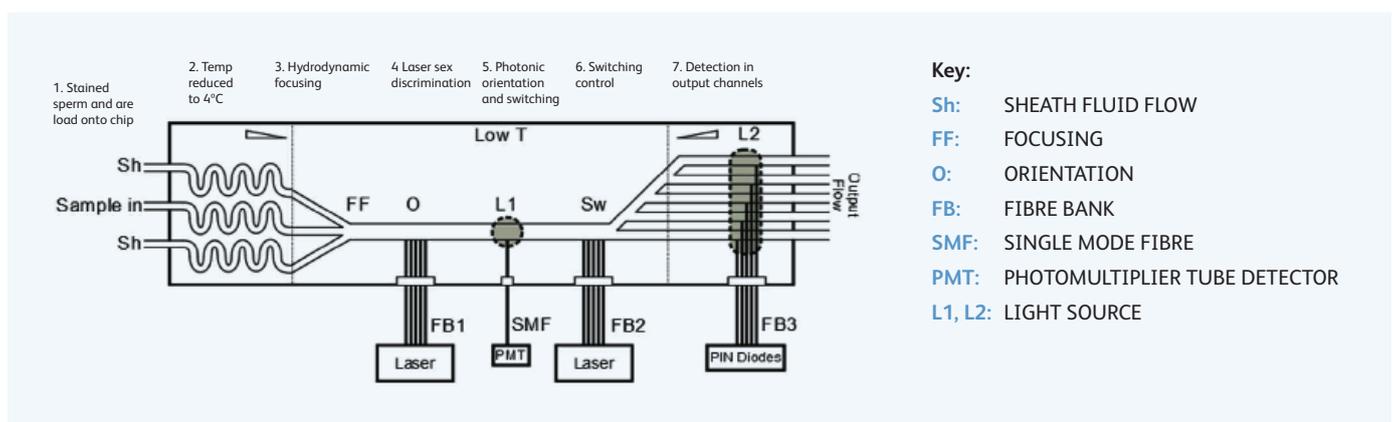
1. Proof of concept, at its University of Auckland laboratory, of the individual components of the process, namely focusing, orientation, detection, timing and switching.
2. Training of a cohort of research scientists skilled in operating the equipment and materials.
3. A patent (PCT) has been filed for a novel sorting and orienting method for sperm cells.

Developing the full process

Engender plans to combine these proprietary techniques along with other known technologies into a seven-step process on a single micro-fluidic chip. In this process, sperm will be directed into a highly parallel microfluidic chip where they are first stained with a dye that labels the DNA in direct proportion to the amount present, without a significant adverse impact upon sperm viability. This technique is also used in the current flow-cytometer based sorting technology.

The sperm will then be partitioned into droplets of protective fluid – one sperm per droplet. The combination of the laminar flow in micro-scale channels and this protective droplet model will reduce the shear stresses on the sperm as they are sorted (which is a key reason flow cytometry is not used). The droplets containing sperm pass down a microfluidic channel and through a photonic unit consisting of a light source (incorporated through waveguide technology) and a fluorescent detector (photodiode and a filter).

The fluorescent signal from each droplet is measured, at which point a decision is made about sperm sex. Photonic impulses are used both to orient the disc-shaped sperms cells on a plane prior to detection, and to nudge cells into separate channels according to whether they carry male or female DNA. The full process is described in the following diagram:



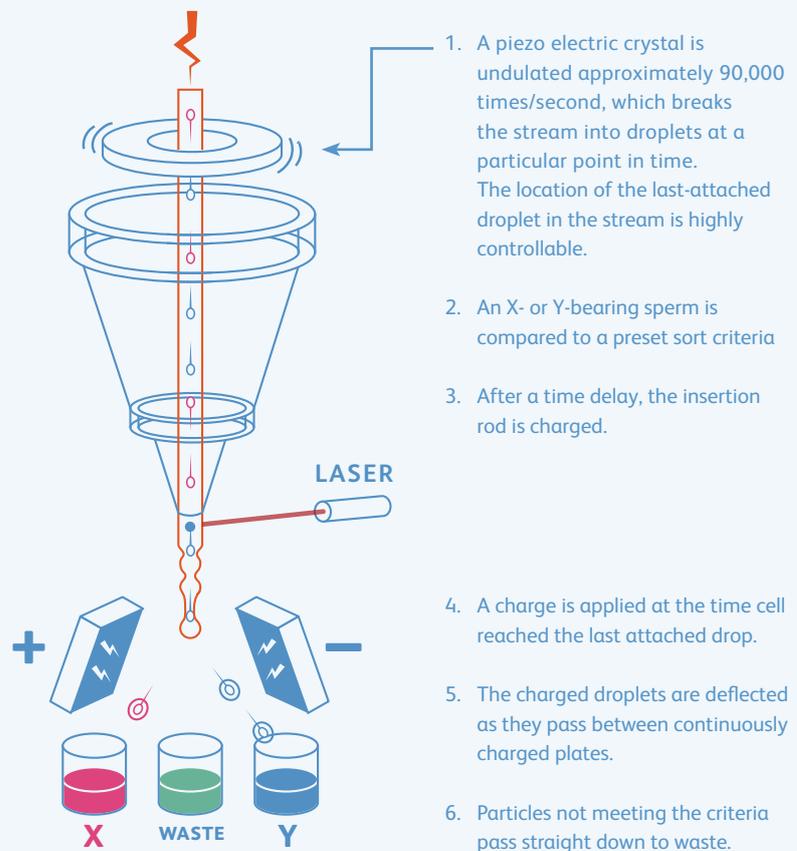
No electric fields or large shear stresses are involved, thus in theory optimising the viability of a sperm after sorting. The device would be expected to run at 4 °C in order to keep sperm immotile without damaging them and to maximise viability.

The novelty of this invention primarily arises from the use of optical switching and focusing; where optical waveguides orientate cells to facilitate sex based sorting of sperm. Novelty is also achieved through the unique ‘composition’ of the system which combines various technologies/qualities to create a useful product.

Comparison with existing technology

Flow cytometry dominates the methods for sexing of sperm. Like the Engender's system it is another form of single cell sorting based on differences in DNA content between male and female DNA bearing sperm. Sperm are stained with a fluorescent dye and then passed through the flow cytometer as drops of liquid containing a single sperm cell per droplet (Garner and Seidel Jr, 2008). The difference in fluorescent intensity allows the laser and detector to determine the sex of the sperm. The droplet can then be electrically charged and is sorted by an electric field via the charged droplet interactions

Take-up of this technology has stagnated since around 2008-9, as described in 'What problem is Engender trying to solve?', below.



Engender's scope of work

A lab-on-a-chip device designed to sort mammalian sperm by sex will be constructed out of inexpensive polymer (e.g. PDMS, parylene) and glass/fused silica materials. It will be constructed in a modular fashion. The current working model has the following components:

- input port
- secondary port for carrier fluid
- output port(s) for collection of the desired sex of sperm
- staining reservoir
- sperm-droplet formation stage
- fluorescence measurement incorporating signal processing (i.e. lock-in methods)
- micromechanical valve

Stage I

Engender's initial scope of work is to combine the process, which has to date been performed in separate stages in a lab, onto a single chip. Once this milestone is achieved (see 'Milestone' under *Use of Investor Funds*, below) the remaining capital will be called.

Stage II

Combining the process on a chip, together with evidence of motility, is expected to be enough to act as a basis for exploratory commercial discussions with a number of large AI firms globally. In Stage II, Engender expects to initiate general business development activity focused on the 10-12 largest AI firms globally, as well as working towards mass parallelization of the device on a single chip, and development of a prototype device which can be demonstrated to commercial partners.

Offer Summary

The Offer:

Engender is seeking to raise up to \$1,250,000 by the issue of new preferred ordinary shares of the Company (**Investor Shares**) (the **Share Offer**).

Assuming \$1,250,000 is raised through this Share Offer, 381,098 new shares will be issued to investors at \$3.28 per share.

An investor must commit a single “Investor Commitment” amount in their Application Form.

The Investor Shares will have the rights set out in a new Subscription and Shareholders’ Agreement and Constitution in relation to Engender (see ‘**Investment Documents**’ below).

The total number of shares (including Investor Shares) on issue after this capital raising will be 763,481. At that point and on that basis, the Investor Shares would represent 50% of the shares in the Company.

Pre-Money Capitalisation Table

Note: the seed investors in Engender funded the Company’s R&D activities via a convertible loan note (CLN). These loans convert to shares (which will also be Investor Shares) on the completion of this Offer. For simplicity, the following table treats the CLN as converted into shares.

Engender Technologies		Cap Table post conversion (pre money)		
Shareholders	Role	Cash in	Shares	Diluted
Ordinary Shares (founding)				
UniServices	Founder		130000	31.86 %
Ogilvie Holdings	Founder		117000	28.67 %
Robert Feldman			33000	8.09 %
Miriam Cather Simpson			20000	4.90 %
Total Ordinary Shares			300,000	73.51%
CLN Investors				
NZVIF	CLN	\$ 40,532	27,021	6.62 %
Pacific Channel	CLN	\$ 5,533	3,689	0.90 %
Stuart Davey	CLN	\$ 30,000	20,000	4.90 %
Paul Smart	CLN	\$ 5,000	3,333	0.82 %
UniServices	CLN	\$ 81,065	54,043	13.24 %
Total investment		\$ 162,130	108,087	26.49%
Total Shares			408,087	100%

Investment Documents

Following completion of the offer, it is intended that the founding shareholders, the CLN investors and the new investors will enter into a subscription and shareholders' agreement (**Subscription and Shareholders' Agreement**) and Engender will adopt a constitution (**Constitution**) based on the industry standard documentation published by the New Zealand Venture Investment Fund (NZVIF), in relation to its Seed Co-Investment Fund (SCIF), with appropriate modifications approved by the Directors. Investors will be provided the final form of the Subscription and Shareholders' Agreement and Constitution prior to investment.

In the Application Form, each investor authorises Engender to sign on their behalf the **Subscription and Shareholders' Agreement** and any necessary shareholders' resolutions in relation to the offer subject to receiving the final version of those documents.

Purpose of the Offer

The purpose of this offer is to build a prototype that can sort bovine sperm cells by gender on a single chip in commercial quantities. In order to do this, the Company will first have to achieve sex sorting of bovine sperm on a microfluidic chip (see '**Engender's scope of work**' above. \$625,000 of capital is earmarked for this purpose. Once this milestone is achieved, the Company intends to use a further \$625,000 to begin commercialization and further product development. See the section **Use of investor funds** below for a full description of the milestone.

Once a working prototype is developed, the intended strategy is to license the technology to one or more global AI firms. A discussion of the potential value of such a business model is in the section **Potential revenue below**.

Price of the Shares

A total consideration of \$3.28 per Investor Share is payable.

Payment for Shares

Consideration for Investor Shares is payable as follows:

- Directors will determine the offer Closing Date and give written notice to investors of the amount payable;
- Consideration is payable within 7 days of the notice being received;
- Failure to make payment for Investor Shares will be handled according to the default provisions in the Subscription and Shareholders Agreement.

Rights Attaching to Investor Shares

The Investor Shares will rank equally in all respects with existing Shares, except as described below and in the **Subscription and Shareholders' Agreement** and Constitution. Investor Shares will have 'anti-dilution rights'. If the Company subsequently issues shares at a lower price than the effective average price of the shares held by the investors, the Company will issue additional shares to the investors for nominal consideration to reduce the effective average price of the shares held by the investors to that lower price.

Investor Shares have certain preferences over the ordinary shares held by the existing Shareholders, including enhanced pre-emptive rights on the issue or transfer of shares and the right to preferential payments on a liquidation or sale of the business. The rights of the Investor Shares will be described in full in the **Subscription and Shareholders' Agreement** and the Constitution of Engender.

Share Register

Engender will manage the share register.

Acceptance of Applications and Minimum Application

The minimum subscription is \$25,000 and subscriptions must be made in multiples of \$2,500 thereafter, unless otherwise determined by the Directors either generally or in any particular case. Applications from investors will be considered on a first-come, first-served basis. The Directors may accept or reject any application in whole or in part.

Minimum Subscription

The minimum amount sought is \$400,000. If \$625,000 or more is raised, the entire amount will be drawn down immediately.

If less than \$625,000 but more than \$400,000 is raised, funds will be held in trust until another funding source e.g. grants can be obtained to reach a total of \$625,000, i.e. enough to reach the Milestone. If this threshold is not reached within 12 months, all money will be returned to investors, less the expenses associated with this Share Offer.

Over-Subscriptions and Refunds

This Share Offer aims to raise funds of \$1,250,000.

Over-subscriptions will not be accepted.

Dividend Policy

In the short term, the Directors intend to reinvest retained earnings to support commercialisation and expansion of Engender. Engender is unable to predict the time of any dividend payment as this will depend on profitability and the financial position of the Company.

Offer Period

The Share Offer will be open from the date of this Information Memorandum 6 June of 2014 and close on the Company securing \$1,250,000 or such earlier date as the Directors of the Company may determine ('Close Date').

Brokerage

Pacific Channel Limited is the broker of this Share Offer. Pacific Channel has also provided full management services to Engender without compensation since the inception of the Company. Pacific Channel will receive a brokerage fee of 6 % of the funds raised under this Share Offer (plus GST). Pacific Channel will also receive 6 % of the value of capital raised in warrants to acquire shares in the Company, on the same terms and conditions as new investors, exercisable for five years after grant.

Underwriting

The Share Offer is not underwritten.

What problem is Engender trying to solve?

In recent years, growth in newly industrialised countries has seen an increase in demand for animal products (see figure at right⁹) If the rising demand for beef & dairy products are combined then it is evident that cattle are becoming the most sought after agricultural animal (FAO, 2011). To fulfil these needs, the agricultural industry is faced with the challenge of efficiently increasing capacity whilst factoring in both economic & environmental sustainability of their practices.

Although AI is widely used throughout the cattle industry for selection of commercially valuable traits, it traditionally failed to maximise reproduction efficiency through fulfilment of sex preference. Whilst the beef industry has a preference for bulls to provide more meat mass, the dairy industry desires milk producing cows. Both of these industries are underpinned by the reproduction capacity of cows, especially heifers which are highly prized by the farming & food industry.

Projected Total Consumption of Meat and Dairy

	2010	2020	203
	<i>(Million Tonnes)</i>		
WORLD			
All meat	268.7	319.3	380.8
Bovine meat	67.3	77.3	88.9
Ovine meat	13.2	15.7	18.5
Pig meat	102.3	115.3	129.9
Poultry meat	85.9	111.0	143.5
Dairy not butter	657.3	755.4	868.1
DEVELOPING COUNTRIES			
All meat	158.3	200.8	256.1
Bovine meat	35.1	43.6	54.2
Ovine meat	10.1	12.5	15.6
Pig meat	62.8	74.3	88.0
Poultry meat	50.4	70.4	98.3
Dairy not butter	296.2	379.2	485.3



9. FAO, 2011

Currently most dairy farmers breed only through bull selection. Female calves are used as herd replacement for the dairy herd and the male calves go to the beef industry. A low cost high fertility rate sex sorting would allow them to choose to breed the top half of their herd for dairy replacements. This should enhance the rate of genetic gain of a herd. It would also allow dairy farmers to inseminate the bottom half of the herd with beef genetics, providing additional income. Low cost sex selected sperm could also enable the use of AI in swine.

The need for sex selection was highlighted with some industry experts claiming a rising demand for female calves and shortages of female progeny, particularly of certain breeds such as 'Friesian' common in the dairy industry (CRV-Ambreed, 2011, Picklesimer, 2011). These market trends are expected to drive demand for sexed sperm which will also improve efficiency of artificial selection for commercially desirable traits.

The commercial use of flow cytometry for sex sorting (sexing) of sperm in 2003, heralded a new era in AI. Despite its potential, this method is significantly hindered by technical issues that impacted on the quality of the end-product. These flaws include:

1. *Limited flow rate & consequent low throughput:* The rate of 15-20 million sperm per hour has been considered too slow for many commercial AI suppliers. The low output limits the number of cells that can be commercially justified per straw to about one tenth that of unsexed straws

2. *Damage to sperm cells:* Flow cytometry sorted sperm has 20-25 % lower fertility rate (compared to non-sorted sperm) due to damage from electrical charge & shear stress(Wheeler et al., 2006).
3. *Specialised, expensive & cumbersome flow cytometry equipment:* This limits the number of sorting centres and requires extensive training/employment of highly specialised staff.
4. *High production/processing cost:* Semen costs pale in comparison to production costs such as feed & grazing costs. Nevertheless there is a perception among beef cattle farmers that artificial insemination & sexed semen is a premium product at high costs. This can be changed by competitive pricing & increased fertility rates, combined with targeting farmers which strongly prefer a particular gender of offspring.
5. *Limited application:* The use of flow cytometry sexed sperm is mostly restricted to heifers (virgin cows) due to unacceptably lower fertility rates in cows.

What kind of clients is Engender targeting?

Engender's device is targeted at existing AI product manufacturers/distributors such as LIC (Livestock Improvement Co) or CRV-Ambreed. The end clients of these companies are livestock producers, initially cattle raisers and dairy farmers but later including swine farmers.

The target markets for this technology are well developed economies with mature AI industries within the agricultural industry (e.g. USA, NZ, Australia) as well as emerging markets such as India, China, Argentina, Chile & Brazil.

In summary, Engender's technology has the potential to overcome the limitations of flow cytometry due to the following characteristics:

1. **Higher flow rate:** leading to faster production of sperm samples.
2. **Use of optical pressure for sorting:** eliminates damage from electrical charge to improve viability.
3. **Laminar microfluidic system:** removes shear stress to minimise sperm damage, as above.
4. **Ease of use (low technical requirement):** requiring less training skills and/or specialised equipment relative to what is required for flow cytometry.
5. **Substantially cheaper cost of production:** resulting in easier establishment of sorting facilities, greater profits & potentially improved access of technology to less developed markets.

The Market

Incumbent technology

In the existing sexed sperm market, the only current competitor, Inguran LLC dba Sexing Technologies licenses its sexing protocol from XY Inc. The subsequently produced sexed semen is sold on the market both under its own 'Sexing Technologies' brand ('ST') and through supply to AI providers. The use of XY Inc's sexing protocol requires purchase of a flow cytometer. Therefore, the incumbent method of sperm sexing requires both protocol license and purchase of a flow cytometer.

Market Size

From 2006 to 2008, the market for sexed semen in the USA increased drastically from 1.4% to 17.8% of all AI for heifers. This resulted in approximately 2 million sexed semen straws being produced in 2008. However, the market is volatile, with overall sales dropping to 1.7 million straws in 2009 due to reductions in the price of dairy and consequent cattle requirements. Sexed semen use recovered in 2010. The use of sexed semen has been very sensitive to changes in dairy prices (Vries, 2012). It is thought the average premium for sexed semen over unsexed is ~US\$20-30 a straw.

The global semen market size is exceeding US\$1.5 billion annually (MicroBix-Biosystems, 2012). Sexing Technologies, the only commercial provider of sexed semen, processed 3.8 million sexed straws in 2008 worldwide (Sexing Technologies, 2009), which would equate to circa \$100 million in sales.

The Opportunity

Market Potential

Uptake of sexed sperm can be significantly improved if technical barriers can be overcome and production costs can be reduced (De Vries, 2012). Furthermore increasing trends of AI requirements in the beef cattle industry and the shortage of heifers for herd maintenance should drive future market growth.

The market potential for sexed semen has already been established in the USA. However, market uptake of sexed semen outside of the USA is currently limited. In Australia where there are 25 million cattle, sexed semen only made up an estimated 4% of total artificial insemination doses in 2010 (Markham, 2010). This may be due to the absence of national sperm sexing facilities causing high fixed costs for laboratory establishment (US\$300,000-500,000) and additional investments required to acquire flow cytometry equipment and trained staff (Sexing Technologies, 2009). In contrast, Engender's sexing method is expected to require a significantly reduced investment which would make it more accessible to the AI industry than incumbent technology.

Potential competition

The incumbent technology for sex sorting is discussed extensively in the 'Technology' section, above. Another competitive threat stems from the emergence of future rival technologies. Microbix's LumiSort is a next generation sexed-sperm sorting technology which is based on flow cytometry. LumiSort provides higher throughput than traditional flow cytometers as well as reducing shear stress through use of a gentle flow system and elimination of electrical sorting. LumiSort was expected to be launched onto the market by 2013, but has not to date been launched. In February 2014 Microbix announced closure of a round of debt funding for further development of Lumisort, with a view to having a prototype by late 2014.¹⁰ The company first announced its acquisition of a sex selection technology to the market in September 2005.¹¹

Business model

It is too early for Engender to make any final decision on its business model but based on existing market conditions it expects to prioritise licensing out its technology to AI firms on a non-exclusive basis (or perhaps offer exclusivity for a period for a region in exchange for an upfront consideration). Other revenue models worth exploring include sale of sorting machines to multiple sites in each country and supply of consumables (e.g. disposable chips) to each of the machines. The licence would return a royalty on each sample sorted and consumable supplies would further bolster profits. Alternatively, Engender could provide and manage a sorting lab within key AI sites, which is Sexing Technologies' current model.

10. TMX filing, 20 February 2014.

11. TMX filing 30 September 2005.

Potential revenues and pricing

Engender believes that to capture 20% of the global dairy insemination market, it will need to enable AI firms to offer farmers a 2 to 1 cost-benefit ratio. In other words, the economic value of sex selected semen must be at least double the additional cost to the end user.

The economics of dairy are complex. However, some work by academic George Seidel Jr of Colorado State University has attempted to model the value added by sex selection in dairy. He found a value add of US\$23-67 per straw, with the upper end of the range corresponding to a high price of heifer calves.¹² These values assumed a constant level of fertility for sexed and unsexed semen.¹³ In a 2003 analysis, Seidel hypothesized that with near normal fertility of sexed semen and a premium for sexing in the range of \$10 per dose, sexed semen likely would become economically and environmentally beneficial for most cattle. Fetrow (2007) found sexed semen could be viable at a price premium under \$25 and with a loss in conception rate of less than 10%.

In the US, sexed semen grew to capture ~24% of heifer first inseminations between 2006 and 2008. (Heifers are more fertile than cows and it makes sense to use expensive sexed semen on these animals). However, market share fell the next year to 17% once it became apparent conception rates were lower. This suggests strong latent demand for sex sorting which could be tapped by a better performing product or service.

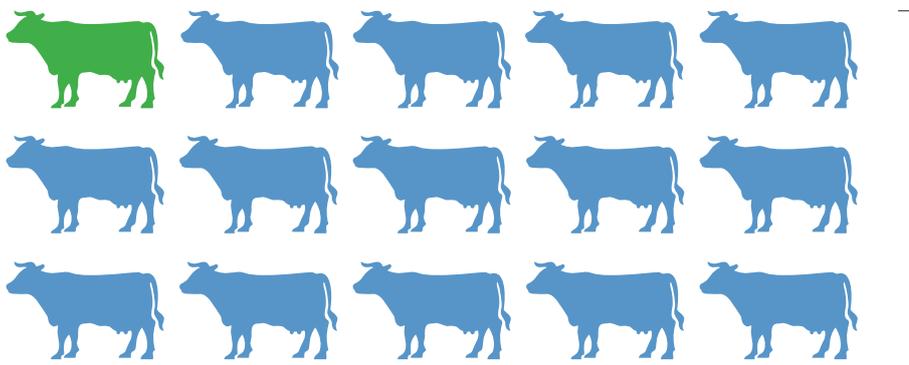
This analysis overlooks the long-run accretive value of being able to selectively breed the whole herd for optimal genetics. (For example, a dairy farm might breed the top half of their herd for females, while cross-breeding the bottom half of the herd for males using beef genetics). This may be the reason the price of a straw of sexed semen is thought to have remained around US\$20-30 in the US; producers using this service probably have elite breeding programs and can afford to pay more for a dose.

ENGENDER'S TARGETED MARKET SHARE

= \$100 mil dairy AI market

Sex-sorted AI

Unsorted



Addressable market for cost effective, normal fertility solution

12. Paper assumed a US\$380 premium for heifer calves led to a \$67 value of sex selection and a \$180 premium translated to a \$23 value.

13. The model found a range of US\$8 to US\$47 if conception rates for sexed semen were 10% lower than normal and a range of negative US\$5 to positive \$30 per straw if conception rates were 20% lower.

Pricing model key assumptions

Factor	Assumption	Rationale
Market share (by # of inseminations)	20 %	Based on delivery of a 2:1 benefit-to-cost ratio for end user
Price – unsexed semen	\$8	Global average
Price – sexed semen	\$20 (\$12 premium)	Provides a benefit of 5.6 times (high case) to 1.9 times (low case) to end user
Royalty	11.25 %	Average royalty disclosed by potential competitor; net of royalty share to UniServices ¹⁴

The above assumptions disclose a potential revenue for Engender of over \$70m per annum (see table). The economics of cattle breeding are complex, and this should not be taken as a forecast. Nevertheless, the directors of Engender believe that if its technology can be scaled up and commercialized with minimal loss in conception rates, then very substantial revenues are achievable. Note that the assumed premium for sexed semen is much lower than is seen in the marketplace today. This allows for a broader take-up across the dairy industry.

Global dairy AI market	\$1,500,000,000
Doses	175,000,000
Expense/straw unsexed	\$8.029
Sexed premium/dose	\$25
Engender market share (by # of inseminations)	20 %
Premium (targeted)	\$12
Royalty (targeted)	11 %
Sexed semen sales (dose)	35,000,000
Sexed semen sales (\$)	\$701,000,000
Royalty (Engender)	\$78,862,500
Farmer value add (high)	\$67
Farmer value add (low)	\$23
Farmer benefit-cost ratio	5.6
(low case)	1.9

Beef and swine

The market for beef and swine AI is around \$900 million¹⁵, about 60 % of the size of the dairy AI market. If Engender's technology can be adapted for these industries, further revenue potential exists. Insemination of sows requires a higher number of sperm per conception, relative to cattle, and thus a high throughput of sperm will be required at reasonable cost. In theory Engender's process should be well suited to such requirements; but no development work has been done with porcine sperm cells to date.

14. Disclosed in 'Transactions with Existing Shareholders' under 'Important Investment Questions', below.

15. Microbix, 2012

About the Company

Engender was incorporated in Auckland in October 2011. The purpose of the Company was to develop a device that would enable gender sorting for the livestock AI industry without the disadvantages attaching to the incumbent technology. Engender grew out of a longstanding relationship between Pacific Channel, adviser to Engender, and UniServices, the commercialization arm of the University of Auckland. The Board of Engender is made up of Brent Ogilvie of Pacific Channel and Jim Mervis, an adviser to UniServices. The inventor of the technology is Professor Cather Simpson, one of New Zealand's most highly regarded scientists as evidenced by share of contestable grant funding. See below for biographical information on key people involved with Engender.

Related party transactions (described further in '**Important Investment Information**', below):

- Under the terms of a Licensing Agreement (as amended) between Engender and UniServices, Engender agrees to pay UniServices the lesser of 2.5% of any licensee revenues derived from Engender's technology, or 25% of Engender's royalties.
- Pacific Channel is retained by Engender for capital raising (brokering) and company secretarial services. Pacific Channel provides a part-time CEO, which is not separately charged for.

Liquidity strategy

An investment into Engender at this stage is highly illiquid. No market exists for the shares at present. If the Company is successful in signing a royalty agreement with one or more global AI companies and becomes revenue positive, it may be possible to list Engender on the NZX or another stock exchange, capital markets permitting. This is unlikely to happen in less than three years from the date of this information memorandum. An alternative liquidity strategy is for the Board to approve a trade sale of Engender or its IP rights to a strategic investor, most likely an AI company. This could take place as early as the completion of the Milestone (see *Use of Investor Funds*, below), or be delayed until well after establishment of the technology in the commercial AI market.

Use of Investor Funds

The purpose of this Offer is to fund further development of a sex separation process that can act as the basis for commercial negotiations. Getting to that point requires a two stage R&D project.

STAGE ONE

The scope of the first stage is:

- i. to optimize the essential components for desired performance and to understand their limitations,
- ii. to put them all together in one working chip,
- iii. to optimize that chip for desired performance and to understand performance limitations, and
- iv. to measure the motility of sorted sperm as an indication of viability (fertility).

Stage One budget

(all figures are indicative only and subject to change)

People (8 months)	\$386,000	Engineering RA (0.75 FTE)
		Photonics Engineer (0.67 FTE)
		Eng Sci Technician (2 FTE)
		Cather Simpson (0.13 FTE)
		Peter Hosking (0.4 FTE)
Consumables	\$194,000	Includes biology testing
Total	\$580,000	

Milestone

Engender's proof of concept chip being able to sort bovine sperm cells in a single chip to >70% enrichment in female sperm, under lab conditions.¹⁶ Sperm must be shown to be motile under a microscope.

Once the Directors are of the view the Milestone has been met or is likely to be met, the Directors intend to begin spending on Stage Two.

STAGE TWO

The scope of the second stage is:

- i. to further develop the business by engaging in commercial discussions with likely licencees and/or acquirers of the Company; including further evidencing of the quality of processed semen,
- ii. to increase the throughput of the process using mass parallelisation;
- iii. to embed the process in a device with sufficient performance and robustness as to serve as the basis for advance sales.

The budget for this stage is up to \$625,000 supplemented where possible through further development grants. Based on current knowledge, Engender cannot be sure that the budget for Stage Two will be sufficient to cover all expenses to produce a working commercial prototype, or what grants may be available to supplement Engender's own funds. However, management believes that the amount of funding sought is adequate to greatly enhance the prospects of unlocking the economic value of the process created in Stage One.

Additional sources of funding for Stage Two may include upfront payment(s) from potential licensees in exchange for a period of market exclusivity for a geographic region or industry.

16. Note that with the addition of mass parallelisation to the process at a later date, enrichment of over 90% should be possible.

Financials

Balance Sheet

Engender Technologies Limited
As at 31 January 2014

31 Jan 2014

Assets	
Bank	
BNZ Cheque Account	\$861
Total Bank	\$861
<hr/>	
Total Assets	\$861
Liabilities	
Current Liabilities	
Accounts Payable	\$259
Convertible Loan - Bellbird Trust	\$2,500
Convertible Loan - Davey Partnership	\$30,000
Convertible Loan - NZVIF	\$40,532
Convertible Loan - Pacific Channel Ltd	\$669
Convertible Loan - Saddleback Trust	\$2,500
GST	-\$40
Total Current Liabilities	\$76,420
<hr/>	
Total Liabilities	\$76,420
<hr/>	
Net Assets	-\$75,559
Equity	
Current Year Earnings	-\$1,007
Retained Earnings	-\$74,552
Total Equity	-\$75,559

These accounts have been prepared by VCFO Limited, Chartered Accountants of Auckland. They have not been audited

Profit & Loss

Engender Technologies Limited
For the month ended 28 February 2014

	Feb-14	YTD
Gross Profit	\$0	\$0
<hr/>		
Less Operating Expenses		
Bank Fees	\$4	\$46
Consulting & Accounting	\$19	\$984
Total Operating Expenses	\$23	\$1,030
<hr/>		
Net Profit	-\$23	-\$1,030

Key People

Brent Ogilvie

(Part-time Managing Director)

BSc. (Bio.), MBA

Brent manages operations of Engender. He has extensive experience in early stage venture development, international business development and corporate partnering. Brent is co-founder of Pacific Channel Limited, New Zealand's leading venture creation, development and investment firm focused on startup and early-stage material, life-science and clean-tech innovation. Pacific Channel has also provided full management services to Engender without compensation since October 2012. Pacific Channel is a seed coinvestment partner of the New Zealand Venture Investment Fund. Through Pacific Channel's activities as a seed investor, Mr Ogilvie also serves as Director of LiquidStrip, Androgenix (which has developed a potential sperm fertility enhancement technology), Breathe Easy, D'Arcy Polychrome, Living Green and SciTOX. Mr Ogilvie was co-founder and Director of Somnaceutics (another dairy technology company), which he led and managed from start up through to recruiting a replacement full time CEO. He also helped facilitate a successful liquidity event for shareholders of the company (asset sale to New Image Group) within three and a half years from start up. He was also Director of Ecodiesel, which sold its business assets to Z Energy. Mr Ogilvie was previously New Zealand Consul and Trade Commissioner to New York and prior to that had a number of commercial management roles.

Jim Mervis

(Director)

Jim Mervis specialises in company development in life sciences and communications. He has an extensive background in securities and commercial transactions; defining and establishing strategic alliances and securing the financial and human resources for corporate growth. During the past ten years, Mr. Mervis played a pivotal role in the structure, finance and management of four of the most notable bio-pharmaceutical start-ups of the period: Barrier Therapeutics, Cardiokine, Intercept Pharmaceuticals and CoDa Therapeutics. He is managing director at Bioscience Strategies NZ Ltd, chairman of CoDa Therapeutics, member of the scientific advisory board of Manuka Health NZ and special advisor to NZTE and Auckland UniServices. Drawing on this experience, his consultancy, Bioscience Strategies NZ, is helping scientists more effectively capture their research's commercial potential. Key strengths are in structuring international partnerships and understanding what type of partnership will work best for both inventor and investor.

Dr. Roland Toder

PhD (Vice President Business Development and IP)

Roland leads the business development and IP strategy for Engender. Roland is an experienced life science industry manager and consultant with international business development and R&D expertise, based on leadership and management skills, scientific education and research experience with due diligence, validation and technology transfer strengths and a track record of business accomplishments. He has a PhD from Albert Ludwigs University (Germany), and has been involved in executive roles with a number of life science companies which include Biochip Technologies (GmbH), GeneScan Australia Pty Ltd., BiG BioTech GmbH and Vivendy Therapeutics Ltd, among others. He is currently the founder and managing director of Akalpa Life Science Consulting Limited.

Dr. Cather Simpson

(Scientific Advisory Board Member)

Dr. Cather Simpson has a joint appointment in the School of Chemical Sciences, and is the Director of the Photon Factory and Associate Director of the Dan Walls Centre for Pure and Applied Optics at the University of Auckland. She has expertise in photochemistry and photophysics. As a director of the Photon Factory, she manages micro to nano fabrication facilities that can machine microscopic features in virtually any material. In 2012, Dr. Simpson secured a \$7.7 million grant from the Ministry of Business, Innovation and Employment¹⁷, which has been used in part to advance Engender's base technology.

Risks

Introduction

Engender is a privately-owned early-stage New Zealand company. It is exposed to a wide range of risk factors of both general and specific nature that may affect the viability of the business being developed, the future operating and financial performance of Engender and its ability to generate wealth for investors. A number of these risk factors are described below.

Prospective investors should note that the risk factors set out below may not be exhaustive and should consider these risk factors in conjunction with other information disclosed. Each of the risks set out below could, if they eventuate, adversely affect Engender's revenues, earnings or financial condition and its ability to meet the aspirations of Engender described in this document. Changes in variables affecting risk factors may offset each other to some extent or may be cumulative.

The major risks to investors are that they may not recover all or any of their original investment and/or may not receive any returns or may receive returns less than those projected. The inability to recover the investment could arise, among other reasons, because:

- the price at which an Investor Share can be sold is less than the price paid for the Share because the value of the Investor Share may decrease over time;
- the market for Engender's shares becomes illiquid or ceases to exist; or
- Engender is placed in receivership or insolvency.

The Investor Shares will be issued as fully paid Shares and investors will have no liability to Engender for any further payments in respect of the Shares.

If Engender does not generate sufficient revenue to offset expenses or, if at a particular time, Engender's assets cannot be realised for more than its liabilities, then it is reasonably foreseeable that on termination of a subscriber's security, by sale or winding up or otherwise, that the subscriber may receive less than was invested.

If Engender was placed in insolvency, the investors as shareholders would not receive any return of capital until all of Engender's creditors have been paid from the proceeds of its realised assets, because the claims of creditors will rank ahead of those of shareholders. In that situation, or if a third party acquires a controlling interest in Engender or Engender completes a major transaction involving the sale of its business assets, Engender must pay to the holders of Shares (in preference to any payment or distribution to the holders of any other shares) the total amount subscribed for the Shares (Preference Amount). In the case of the Company going into liquidation, any balance available for distribution following payment of the Preference Amount, would be distributed to shareholders in proportion to their shareholding.

General Risks

The Company's future plans and performance, as described in this document, are subject to a number of risk factors, including but not limited to: risks related to the early stage of the Company's business; the fact that the Company has never been profitable or produced a product to date; risks related to the Company's regulatory pathway, how its technology may be regulated and the fact the Company has not received, and may never receive, approval for its technology; the risks related to reimbursement by health care payers if its technology is approved for sale; risks related to the Company's intellectual property position, infringement claims and potential lawsuits; risks related to retaining and attracting qualified scientific and business personnel; risks related to the private and illiquid nature of the Company's capital stock, including the Investor Shares offered under this document; risks related to the potential shareholder dilution, including for potential investors, from such financing activity and the risk that the Company may never be profitable and may never be able to implement an exit strategy.

Economic Conditions

The value of sexed semen is highly correlated to the price of cattle, specifically dairy heifer calves, and through these to milk and dairy prices. Should these prices fall, it may impact Engender's profitability or ability to raise finance. General economic conditions, interest rates and other commodity prices may also affect Engender's performance or viability.

Capital Markets

Should Engender require further funding, there is no certainty that capital markets in Australasia will support Initial Public Offerings in new companies with no or limited revenue. There is similarly no certainty that investors will be prepared to invest in a private start-up company with no or limited revenue.

Government Policy and Regulations

The current regulatory environment and availability of Government assistance is acceptable for Engender's development plans. The regulatory environment and availability of Government assistance may change in a way that adversely affects the Company's ability to execute its plans as outlined in this Offer.

Projections

The Company's current estimates of future performance are based on a number of assumptions, which the Company's management believes are reasonable, but there is no assurance that such estimates will be realised. Actual future conditions may require actions that differ from those contemplated at this time, and there can be no assurance that the projected results will be achieved. There will be differences between these projections and actual results because events and circumstances frequently do not occur as expected, and those differences may be material and adverse. Potential investors are cautioned not to place undue reliance on these projections.

Specific Risks

Limited Trading History

With no revenue history as a guideline, Engender's risks should be considered in the context of a privately owned early-stage New Zealand company with key operational and financial risks around:

- Operating performance;
- Governance and management capability;
- On-going access to capital;
- Product sales and pricing;
- Contractual negotiation; and
- Regulatory compliance and changes.

While the Directors of Engender collectively have international experience in operation of biotechnology business, there can be no assurance that Engender will perform in line with its business plans. Any significant negative deviation from the plan outlined in this Offer is likely to result in a material adverse impact on Engender's operating and financial performance.

If the Company does not generate sufficient revenue to offset expenses, or the Company's assets at a particular time cannot be realised for more than its liabilities, then it is reasonably foreseeable that on termination of investors' security, by sale or winding up or otherwise, the investors may receive less than they invested.

Changes to business strategy

As an early stage company, Engender can be expected to encounter frequent challenges to its business model. The management of Engender can be expected to react to new information, obstacles, changes in the competitive landscape or technological context, etc, through adjusting the business strategy and use of funds as they deem appropriate.

Technology

Engender's technologies are at an early stage of development and are not proven at a commercial scale. There is a risk that Engender may never be able to develop its technologies to commercial viability with the available resources. This could lead to financial losses or cause the Company to be wound up.

Product

Engender believes its technologies can enable its future commercial partners to produce viable products acceptable to their customers. However there is a risk the technologies will not work as expected, for example rates of fertility may be lower than planned for. This may lead to legal action, termination of contracts or a fall in sales.

Key Personnel

The success or otherwise of Engender is likely to be highly dependent on the skills, experience and expertise of its directors, management and employees. In the event that Engender is unable to engage and maintain key personnel, the operating and financial performance of the business may be negatively affected.

Consequences of Insolvency

If Engender was placed in liquidation or wound up, the investors as shareholders would not receive any return of capital until all of Engender's creditors had been paid from the proceeds of its realised assets, because the claims of creditors will rank ahead of those of shareholders. The residual assets (if any) would be distributed to shareholders in proportion to their shareholding, subject to the preferential rights for the holders of Investor Shares set out in the Subscription and Shareholders' Agreement and the Constitution. If Engender becomes insolvent, shareholders will not be liable to pay any money.

The Investor Shares will be issued as fully paid so investors will have no liability to Engender for any further payments in respect of the Shares once issued.

Delays

It may take Engender longer than anticipated to execute any of the elements in its business strategy.

Important Investment Questions

What sort of Investment is this?

The securities offered are Investor Shares (as will be defined in the Subscription and Shareholders' Agreement) in Engender Technologies Limited (**Engender**) (**Investor Shares**). Each Investor Share provides the holder with the right to:

- One vote on a poll at a meeting of shareholders;
- An equal participation with other shares in any dividends declared by the Engender Board of Directors;
- A preference on liquidation or a business sale as described below;
 - Some protection against excessive dilution through future capital raising activity by the Company;
- Be sent certain information about Engender;
- Any other rights as a shareholder, as may be conferred by the Subscription and Shareholders' Agreement, Engender's Constitution and the Companies Act 1993.

If Engender goes into liquidation, a third party acquires a controlling interest in Engender or Engender completes a major transaction involving the sale of its business assets, Engender must pay to the holders of Shares (in preference to any payment or distribution to the holders of any other shares) the total amount subscribed for the Shares (Preference Amount). In the case of Engender going into liquidation, any balance available for distribution following payment of the Preference Amount will be distributed pro-rata to all shareholders. Further details on the rights and obligations of Engender's shareholders will be set out in Engender's Subscription and Shareholders' Agreement and its Constitution, initial drafts of which will be available for prospective investor inspection at Pacific Channel Limited's or Engender's registered office. The Constitution, once adopted, will also be available online at www.business.govt.nz/companies/.

Who is involved in providing it for me?

The Issuer

The issuer of this Share Offer is Engender. Engender is a New Zealand based privately held company that has developed sperm sorting technology.

Its registered office and address for service is:

*Engender Limited
Ground floor, Shed 20, Equinox House,
Princes Wharf, 139 Quay Street, Auckland 1010,
New Zealand*

The directors of Engender are:

Brent Ogilvie
Jim Mervis.

Further details on the directors are provided in the Profile of the Governance and Management Teams. Please note that Engender's company name and/or its directors could change after the date of this Information Memorandum. If such details do change, the updated details can be found online at the New Zealand Companies Office or at the Company's records held at its registered office. There is no separate promoter of the Offer for the purposes of this Information Memorandum.

The Broker

The broker is Pacific Channel Limited (**Pacific Channel**).

Its registered address is:

*Ground floor, Shed 20, Equinox House,
Princes Wharf, 139 Quay Street, Auckland 1010,
New Zealand*

Pacific Channel provides company secretarial services, management and broking (see 'What are the Charges?', below) to Engender. Brent S. Ogilvie is a director and shareholder of Pacific Channel Limited and a director and shareholder of Engender. Pacific Channel is New Zealand's leading investment and venture management firm providing corporate structuring, governance and capital raising support to early stage material, life sciences and clean technology companies. Pacific Channel has provided full management services to Engender without compensation since October 2012. Pacific Channel has an agreement to receive success fees if it assists Engender receive funding from a strategic partnership or licensing agreement. Pacific Channel, through its expertise, seed funds and access to external capital, creates, builds and funds companies to develop and channel their products and/or services into the United States, Europe and East Asia. See <http://www.pacificchannel.com>.

Activities

Engender was incorporated in October 2011. Since incorporation, Engender's principal activities have been research and development of sperm sorting technology.

How much do I Pay?

Investors must pay NZ\$3.28 per Investor Share on submission of a completed Application Form. Applications for the Investor Shares must be made and received no later than 5.30pm on the closing date of the Share Offer, as determined by the Directors (Closing Date). The Directors of the Company reserve the right to extend the Share Offer beyond the Closing Date. Application instructions are set out in the Application Form accompanying this Information Memorandum and Registered Business Information Pack.

The minimum subscription is \$25,000.

Applications should be accompanied by a cheque made payable to "Engender Trust Account" and crossed "Not Transferable".

All cheques must be in New Zealand dollars and sent with the completed Application Form to:

Engender Limited

PO Box 106818, Auckland, 1143, New Zealand.

Alternatively, funds may be sent electronically to Engender Trust Account. Please mark all payments with the investor's name and 'Engender'. All application moneys will be held in Engender's Trust Account in the applicant's name until Investor Shares are allocated. Any interest will accrue to the benefit of Engender. Engender reserves the right to accept any application in full or in part. Over-subscriptions will be scaled at Engender's discretion. The Company will contact applicants within 10 working days following the Closing Date, to advise the number of Investor Shares allotted to applicants. Refunds will be posted no later than 10 working days after the Closing Date (as extended by the Company, if applicable). No interest will be paid on refunds.

What are the Charges?

There are no application charges for Investor Shares under this Share Offer. All expenses including administration, promotion fees and legal and accounting costs incurred for the Share Offer will be borne by the Company.

Pacific Channel Limited will receive a brokerage fee of 6% of the funds raised under this Share Offer (plus GST). Pacific Channel Limited will also receive 6% of the value of capital raised in warrants to acquire Investor Shares in the Company, on the same terms and conditions as new investors, exercisable for five years after grant.

What Returns will I get?

Shareholder returns on the Investor Shares may include both share price movements and any dividends paid by Engender. No returns are guaranteed.

Growth in Share Price

Any changes in share price will be dependent upon a number of factors, some of which are not within Engender's control, including but not limited to, the risks set out under "What are my risks?" below. None of Engender, its Board, Pacific Channel nor any person associated with the offer, promise or guarantee that any movement in share price will occur. Returns on the shares may be by way of capital appreciation (although the market price of the shares may also decline) and any dividends paid and other distributions made in respect of the shares.

The key factors that determine the returns are:

- Engender's financial performance;
- Applicable taxes;

- Reserves and retentions;
- The Board's decisions in relation to dividends and other distributions;
- Interest from a potential acquirer(s) of shares or the business and assets of Engender.

Nothing contained in this Information Memorandum should be construed as a promise of profitability, and Engender does not give (nor does any other person give) any guarantee or promise as to the return of capital or the amount of any returns (including dividends and other distributions) in relation to the shares. The amount of any returns will depend on a number of risk factors outlined below. The risk factors could reduce or eliminate the distributions or other returns intended to be derived from holding the shares.

Dividends

The Company has not established a formal dividend policy and cannot predict the time of any dividend payments, as this will depend on profitability and the financial position of the Company. Neither Engender, its directors, Pacific Channel nor any person associated with this Share Offer, promises or guarantees that any or a particular dividend will be paid on the shares.

Taxation

Taxes are likely to affect the returns to Investors. Generally, where shares are acquired as an investment, shareholders will not be taxed on gains from a subsequent sale of the shares unless the shareholder is in the business of dealing in such investments, or acquired the shares for the purpose of sale. Dividends received will be taxable in the hands of the recipient. The return of subscribed capital is not taxable under current tax legislation. The party legally obliged to pay returns (if any) is Engender. The dates on which any capital returns and dividends will be paid are unknown.

Can the investment be altered?

The rights attached to the shares are set out under the heading "What sort of investment is this?" These rights may be altered by an amendment to the Subscription and Shareholders' Agreement or to Engender's Constitution.

It is proposed that the Subscription and Shareholders' Agreement will be able to be amended by a written instrument signed by Engender and shareholders holding at least 75% of the shares in Engender, but provided that any amendment which affects any special right given to an individual shareholder or materially increases the obligations imposed on a shareholder must also be approved in writing by the affected shareholder.

Engender's Constitution may be amended by a special resolution of shareholders, being a resolution approved by a majority of 75% of the votes of those shareholders entitled to vote and voting on

that resolution or, in certain circumstances, by a court order. Engender must not take any action that would affect the rights of shareholders without approval by special resolution of those shareholders whose identical rights would be affected in the same way by the action. Except for certain limited offers, all shareholders will have the right to participate in new issues of shares.

The holders of Shares will have the additional pre-emptive rights in relation to new issues of shares described in the Subscription and Shareholders' Agreement.

Major transactions and those that would change the nature of the Company's business require the approval of a special resolution.

The Subscription and Shareholders' Agreement will also prescribe a number of activities of Engender which may only be undertaken with the support of a Director appointed by holders of Shares or a special resolution of all shareholders.

Engender is also prohibited from carrying on certain businesses for so long as the New Zealand Venture Investment Fund is a shareholder. These are any business which principally involves one or more of property development, retailing, mining or hospitality (but without precluding a business which markets a technology or other innovation to any of these industries), or acting as a financial intermediary.

How do I cash in my Investment?

Investors are entitled to sell their shares within the framework allowed by the Companies Act 1993, the Subscription and Shareholders' Agreement, Engender's Constitution and the general law. In the opinion of Engender, there is currently no established market for such shares. Investors are not required to pay any charges in relation to the sale of their shares.

Engender's share register will be managed by the Company. The Company's Constitution will include a requirement to offer shares in the Company to existing shareholders (on a pro rata basis) prior to offering these to third parties, subject to certain exceptions.

Who do I contact with Enquiries about my Investment?

Enquiries should be directed to:

Engender Ltd
Ground floor, Shed 20, Equinox House,
Princes Wharf, 139 Quay Street, Auckland 1010,
New Zealand

Phone: +64 21 60 55 66

Email: bogilvie@pacificchannel.com

Is there anyone to whom I can complain if I have problems with the Investment?

Any complaints or problems with the investment should be addressed to the address outlined in the section above. There is no ombudsman to whom complaints can be made.

What other Information can I obtain about this Investment?

On-going Reports to Shareholders

The Company intends to distribute quarterly and annual reports to shareholders and may choose to distribute further reports according to investor demand. These may be obtained free of charge from the Company. All communications will be in electronic format except where required by law.

Engender Limited's Constitution and Shareholders' Agreement

Engender's Constitution contains information relating to the rights of the shareholders. A copy of the Subscription and Shareholders' Agreement and the Constitution will be available from the Company for inspection by prospective shareholders during normal business hours at Engender's registered office or at Pacific Channel Limited, Ground Floor, Shed 20, Equinox House, 139 Quay St, Auckland, New Zealand. The Constitution is also available on the Companies Office website (www.companies.govt.nz).

Valuation Proposition

The issue price of \$3.28 per Investor Share which implies a pre-investment valuation of \$1,254,217.

Assuming \$1,250,000 is raised through this offer, **381,098** new ordinary shares (**Investor Shares**) will be issued to investors and the total number of shares on issue after this capital raising will be 763,481. This implies a post-investment valuation of \$2,504,217.

Schedule of Warranties

The Company warrants to investors, as at the date that the Investor Shares are issued (**Issue Date**), as follows:

Information Disclosed

- Information: All factual information included in the Information Memorandum is true and accurate in all material respects and not misleading in its context, whether by omission or otherwise. Any documents attached to the Information Memorandum are true and complete copies of the originals.
- Full Disclosure: All information relating to the Company which is material for the evaluation of its financial condition and trading prospects has been fully and accurately disclosed in a manner that would not mislead a reasonable investor as to the state of the Company.

Shares and Options

- **Shares:** the shares described in the Information Memorandum, includes the capitalisation of all outstanding loans into Investor Shares, and will constitute all of the issued securities and all rights to be issued securities of the Company immediately prior to the Issue Date.
- **No Shareholdings:** the Company has no shares or other securities in any other company and no partnership interest in any other business and has not agreed to acquire any such shares, securities or partnership interest.

Transactions with Existing Shareholders

- **Arrangements with Existing Shareholders.** There are no:
 - loans made by the Company to existing shareholders of the Company post the Closing Date (**Existing Shareholders**), or any associate of the Existing Shareholders save in relation to unpaid expenses of the Existing Shareholders or any associate of the Existing Shareholders; all existing loans will be capitalised to provide the shareholdings presented in this Offer.
 - Guarantees entered into by the Company in respect to any loans, debts or other obligations of Existing Shareholders.
- **Related Contracts:** except for the services provided to the Company by the Existing Shareholders and/or any associates of them as disclosed in this Information Memorandum:
 - there are no existing and continuing contracts or arrangements between the Company and the Existing Shareholders and/or any associate of the Existing Shareholders, other than a Licensing Agreement with UniServices¹⁸; or
 - the Company does not depend in any material respect upon the use of any property, right or asset owned by, or facilities or services provided by any Existing Shareholders or any associate of them.
 - No Directors' fees have been payable to date. However, following completion of a successful capital raising, the Company intends to begin paying Directors Fees of up to \$12,000 per annum plus a further \$12,000 per annum in shares or warrants. If granted, these would result in a dilution of interest to existing investors.
- **Competition by Existing Shareholders:** none of the Existing Shareholders nor any associate of the Existing Shareholders are directly or indirectly engaged or concerned or interested in any way whatsoever in any other business that is in competition with the Business.

Valid Authorisations

All requirements of the Companies Act 1993 and the Company's Constitution have been complied with on a timely basis in relation to the issue of the Investor Shares pursuant to the Information Memorandum and the allotment and issue of such Shares to the Investors has been authorised by all necessary corporate and other acts and does not violate any trust deed, instrument, agreement or other arrangement to which the Company is party.

Assets Unencumbered

Any material assets of the Company or any subsidiary of the Company (as the case may be) are free of all encumbrances, mortgages, liens, charges, or any other claim by a third party.

Intellectual Property

- **Rights:** the Company owns or is entitled to use all intellectual property required to operate the Business in the manner contemplated by the Information Memorandum.
- **No Infringement:** as far as the Company is aware, the business of the Company as now carried on and as proposed to be carried on as described in this Information Memorandum does not infringe any intellectual property rights of any other person and, as far as the Company is aware, no claims relating to intellectual property used by the Company are pending or threatened by any third party.
- **No Rights Granted:** no rights of any nature have been granted to any other person in relation to intellectual property created or developed by the Company.
- **Related Party Claims:** all intellectual property created by the Existing Shareholders, current and former contractors and employees of the Company which is used, or proposed to be used by the Company in connection with its current or proposed business (as set out in this Information Memorandum) has been vested in and is beneficially owned by the Company.
- **Third Party Intellectual Property:** the Company is not in breach of any agreement to which it is a party relating to the use of material intellectual property owned by a third party.
- **Confidential Information:** to the best knowledge of the Company, there has not been any unauthorised disclosure of any of the Company's financial or trade secrets or other confidential information.

No Proceedings

- **No Litigation at the time of this Information Memorandum:** the Company is not a party to any legal action or proceedings, arbitration, or statutory or governmental inquiry of any kind, nor are the Company aware of any such legal proceedings, arbitration, or inquiry, pending or threatened against, or involving, the Company.
- **No Existing Cause of Action at the time of this Information Memorandum:** as far as the Company is aware, there is not any cause of action, or facts or circumstances existing that could or might be used for commencing legal proceedings, either civil or criminal, against the Company.

18. Under the terms of a Licensing Agreement (as amended) between Engender and UniServices, Engender agrees to pay UniServices the lesser of 2.5% of any licensee revenues derived from Engender's technology, or 25% of Engender's royalties.

Employment

- **No Dispute:** the Company is not involved in any employment, labour or personal grievance dispute or problem, or any dispute with any employee representative or organisation or body of employees and no event has occurred which might give rise to any such dispute.
- **No Profit Sharing Arrangements:** the Company is not a party to a contract or arrangement under which any of its officers or employees are entitled to receive a share of income or profits or a bonus calculated on turnover, income or profits, or any component of any of them, or any similar benefit.

Except that the Company may establish a Share Scheme (or Schemes) for up to 5 % of the existing capital of the Company on such terms and conditions as approved by the Board. For the avoidance of doubt, the Company may not issue any securities to Directors, employees or consultants of the Company other than pursuant to the Share Scheme except the issue of warrants to the Broker as disclosed in this IM.

Contracts

- **Material Contracts:** all material contracts, commitments or arrangements of any nature whatsoever, to which the Company is party, have been disclosed in this Information Memorandum.
- **No Breach of Contract:** as far as the Company is aware, the Company is not in breach of any material contract, commitment or arrangement of any nature whatsoever to which it is a party.
- **Agents:** no person is authorised to act as agent for the Company or to bind the Company (other than the directors of the Company) and there are not any powers of attorney in force given by the Company.
- **Commission:** no one is entitled to receive from the Company any finder's fee, brokerage or other commission in connection with financing of the Company except for Pacific Channel Limited (which is entitled to a capital raising fee equal to 6 % of the amount raised pursuant to the Share Offer plus GST). Pacific Channel is also entitled to receive 6 % of the value of capital raised in warrants to acquire shares in the Company, on the same terms and conditions as new investors, exercisable for five years after grant.

Taxation

- **Lodgement of Returns:** the Company has lodged all taxation returns, reports, declarations, notices, certificates, reconciliations and other information required to be lodged by it with the appropriate body within the relevant time limits.
- **Accuracy:** all such returns, reports, declarations, notices, certificates, reconciliations and other information were accurate, complete and not misleading on lodgement, were made on a proper basis and are not the subject of any dispute.

Books and Records

The Company has properly kept and maintained:

- **Accounting Records:** all accounting records and books of account properly entered and containing true, full and accurate records of all matters required to be dealt with in accordance with NZ GAAP;
- **Statutory Records:** all minute books, records, registers and other records required by law containing full and accurate records of all matters required to be recorded in them; and
- **Returns:** all returns, resolutions and other documents required to be made and all such documents required by relevant law to be delivered or filed with the Registrar of Companies have been delivered or filed within the time required by law and were true and accurate at the relevant time.

Other Obligations

The Company is not affected by any material commitment or obligation which has not been disclosed to the investors in this Information Memorandum.

References

- TORONTO STOCK EXCHANGE. 2012. MICROBIX BIOSYSTEMS [Online].
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- MICROBIX-BIOSYSTEMS. 2012. Lumisort Technology [Online].
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- SEIDEL, R. 2003. Economics of Selecting For Sex
- SEXING TECHNOLOGIES, S. 2009. Gender Value Difference Determines the Economic Advantage of Sexed Semen for Beef Cattle Producers Using Artificial Insemination.

Glossary

- \$ or \$NZD** — New Zealand Dollars
- \$US\$** — United States Dollars
- Addressable market** — The estimated part of a market that represents a royalty revenue opportunity available for the technology that may be generated by Engender
- Applicant** — A person who submits an Application Form
- Application** — An application to subscribe for Investor Shares offered under this Information Memorandum
- Application Form** — The application form to subscribe for Investor Shares attached to this Information Memorandum
- Application Moneys** — The amount payable on Application
- Board or Board of Directors** — The Board of Directors of
- Broker** — Pacific Channel Limited
- Company, the** — Engender Technologies Limited
- Constitution** — The constitution of Engender, as amended from time to time, to be adopted on completion of this offer.
- Director or Directors** — A director or multiple directors of Engender
- Engender** — Engender Technologies Limited
- FTO or Freedom to Operate** — Describes whether a product may infringe upon the intellectual property rights of others
- FY** — Financial Year
- IP** — Intellectual property
- Issuer** — Engender Limited
- Licensee** — A party who has been granted a license to implement Engender technology
- Licensor** — Engender
- Market share** — Estimated percentage of annual global sales (may be indicated for a specific year) accounted for by a particular product or company
- Opening Date** — 6 June 2014
- Securities Act** — The Securities Act 1978, as amended from time to time
- Share Offer** — The offer of Investment Shares under this Information Memorandum
- Share register** — The list of active owners of Engender’s shares, updated on an ongoing basis
- Subscription and Shareholders’ Agreement** — The Subscription and Shareholders’ Agreement proposed to be entered into by the founding shareholders, the CLN shareholders and the investors under this Share Offer.
- UniServices** — Auckland UniServices Limited

Application Form

IMPORTANT

No application will be accepted by Engender Technologies Limited (Engender) unless all requirements of the Company have been met including ensuring all laws have been complied with.

Capitalised terms used in this Application Form have the meaning given to them in the Information Memorandum dated 6 June 2014 (**Information Memorandum**).

APPLICATION

Execution of this Application Form constitutes an offer by the Applicant to subscribe for the number of Investor Shares represented by the Investment Commitment set out below.

Investor Shares must be paid for within 7 days upon written confirmation of allocation by Engender at a price of NZ\$3.28 per share. Investor Shares will then be issued by Engender.

AUTHORITY TO SIGN INVESTMENT DOCUMENTS

The Applicant irrevocably authorises Engender to execute the Subscription and Shareholders' Agreement together with any associated shareholders' resolutions (as described in the Information Memorandum) on behalf of the Applicant.

Name of Applicant:

Address of Applicant:

Email Address of Applicant:

Investment Commitment: \$

The Applicant offers to subscribe for the value of Investor Shares shown above on the terms and conditions set out in the Information Memorandum, the Subscription and Shareholders' Agreement and Constitution.

The Applicant confirms that the Applicant is one of the following:

- "wealthy investor/s" – please enclose completed certificate (form **attached**);
- "experienced investor/s" – please enclose completed certificate and investor's acknowledgement (forms **attached**);
- Not resident in New Zealand or otherwise not a member/members of the public for the purposes of the Securities Act – please discuss this with Engender before signing this form.

Signature of Applicant(s):

Date:

/ /

APPLICATION INSTRUCTIONS

1. Engender will confirm the initial allocation of Investor Shares in writing to Applicants as soon as possible, together with the payment required.
2. The minimum subscription is \$25,000 and subscriptions must be made in multiples of \$2500 thereafter, unless otherwise agreed by the Directors.
3. Payments are to be made by cheque made payable to "Engender Technologies Limited" and crossed "Not Transferable".
4. An application by a company, trust or other body must be signed by a person/persons duly authorized for that purpose.
5. Joint holders (including trustees of a trust) must all sign, unless evidence that this is not required is provided.
6. An application may be executed by an attorney, in which case the relevant power of attorney must accompany this form, together with a certificate of non-revocation.
7. When completed, this form together with any applicable certificate be forwarded to:

Engender Technologies Limited
PO Box 106 818
Auckland 1041
New Zealand
8. Payment of Application Moneys must be made to:

Account Name: Engender Technologies Ltd Trust Account
Number: 02-0108-0204945-001
Reference: [Name] EngenderIM
Bank: Bank of New Zealand
Address: 50 Manners Street, Wellington

CERTIFICATE FROM AN INDEPENDENT CHARTERED ACCOUNTANT CONFIRMING THAT INVESTOR IS A WEALTHY INVESTOR

Date: / /

To Engender Technologies Limited

Investment in Engender Technologies Limited

I, an Independent Chartered Accountant, confirm and attest that

[insert name] (the **Investor**) is 'wealthy' for the purposes of section 5(2CBA) of the Securities Act 1978 and in accordance with the requirements of section 5(2CD).

The above certification is given on the basis that I am satisfied on reasonable grounds that the above named eligible person:

- (a) has net assets of at least NZ\$2 million; and / or
 - (b) has had an annual gross income of at least NZ\$200,000 for each of the last 2 financial years.
- [delete as appropriate]

I confirm that I am independent from the Investor and Engender Technologies Limited.

Yours Faithfully

Signature

Name

Name of independent accounting firm

Phone:

Email:

Address:

CERTIFICATE FROM A FINANCIAL SERVICES PROVIDER CONFIRMING THAT INVESTOR IS AN EXPERIENCED INVESTOR

Date: / /

To Engender Technologies Limited

Investment in Engender Technologies Limited

I/We confirm that I am/we are satisfied on reasonable grounds that

[insert name] (the **Investor**), as a result of having experience [in investing money]* or [in the industry or business to which the securities relate]*, is able to assess, in relation to the offer of securities (shares) by Engender Technologies Limited:

- (i) the merits of the offer; and
- (ii) the value of the securities; and
- (iii) the risks involved in accepting the offer; and
- (iv) the Investor's own information needs; and
- (v) the adequacy of the information given by Engender Technologies Limited.

I/We confirm that I/we have given the Investor a written statement of my/our reasons for being satisfied as to the matters set out above as required by section 5(2CE)(b) of the Securities Act 1978.

I/We confirm that I am/we are independent from the Investor and Engender Technologies Limited.

Yours faithfully

Signature

Name

Name of independent accounting firm

Phone:

Email:

Address:

*Delete as applicable

INVESTOR'S ACKNOWLEDGEMENT

Date: / /

Investment in Engender Technologies Limited

I, [insert name] (the **Investor**) acknowledge that, in relation to my subscription for shares offered by Engender Technologies Limited, that:

- (a) the financial service provider named in the attached certificate, an independent financial service provider, has not given me an investment statement or a registered prospectus in relation to the shares offered by Engender Technologies Limited; and
- (b) I understand that I will not receive information usually provided by an issuer in respect of an offer of securities to the public including (in particular) an investment statement and a registered prospectus.

Yours faithfully

Signature

Name

Appendix

Appendix A: Operational timeline

The timeline below is indicative only. Plans may change in response to circumstances.

ACTIVITY	START	END
Project Start	01/07/2014	
Stained sperm onto chip	01/07/2014	26/07/2014
Temperature control	01/07/2014	30/08/2014
Hydrodynamic focusing optimisation	01/07/2014	31/07/2014
Fluorescence sex discrimination	31/07/2014	30/08/2014
Photonic orientation and switching	30/08/2014	28/11/2014
Switching control	28/11/2014	28/12/2014
Detection in output channels	28/11/2014	02/01/2015
Milestone	02/02/2015	
Stage II	11/02/2015	30/08/2015