



# Advancing a new male infertility treatment

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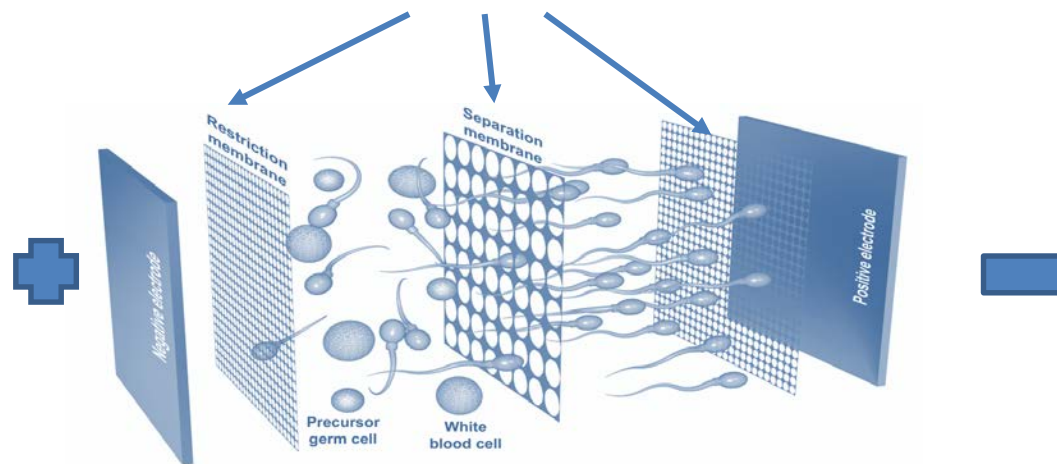
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# Core Asset: Bio-Separations Intellectual Property

## First Application: Male Infertility Treatment

- Memphasys has unique, patented IP for separating valuable cells and molecules from biological fluids (“Bio-Separations”)
- The most commercially advanced application, developed with global reproductive medicine expert, Prof John Aitken at Uni of Newcastle, selects the best sperm from donor semen samples for use in IVF procedures

*Special polymer membranes separate cells by size*



*Gentle electrical forces separate cells by charge*

## Addressed Market Need: Male Infertility

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- Clinical need to reduce male factor contribution to couple infertility (presently at ~40%)
- Need to decrease ART<sup>1</sup> financial and emotional cost by decreasing
  - No. of procedures required
  - Patient angst associated with ART
  - Cost per procedure

1. Assisted Reproductive Technology

# Problems with current sperm selection processes

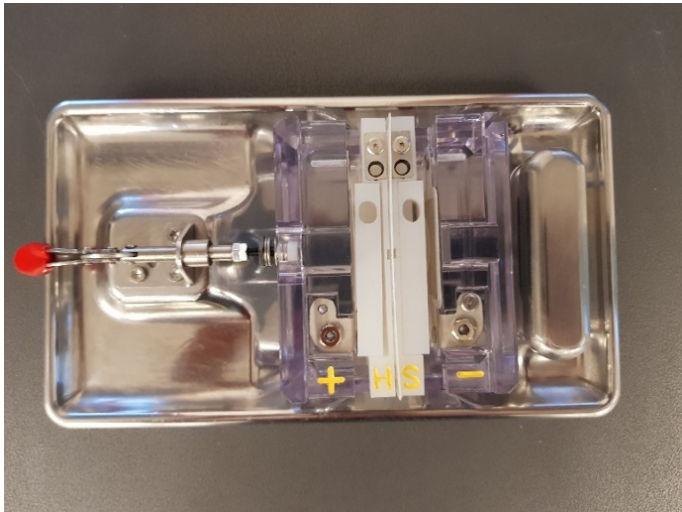
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<b>Density Gradient Centrifuge, “DGC” (Used for IVF and IUI)</b>	<b>‘Swim Up’ (Used for ICSI)</b>
Slow, laborious lab processes ( ~40 minutes)	Quite laborious (~30 minutes)
Damages sperm DNA: <ul style="list-style-type: none"> <li>➤ less pregnancies</li> <li>➤ less full term births</li> <li>➤ may lead to genetically damaged progeny</li> </ul>	Requires motile sperm
	Low sperm harvest rate
	The individual sperm is selected manually <ul style="list-style-type: none"> <li>➤ bypasses natural selection of fittest sperm</li> <li>➤ can unknowingly select sperm with damaged DNA</li> </ul>

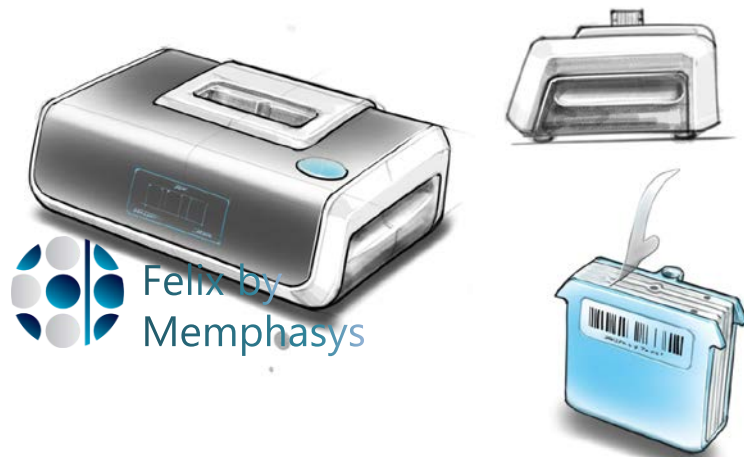
## Felix: Memphasys' product to address male factor infertility

*Felix*, MEM's lead product program, is a device to prepare sperm for use in artificial reproduction

*Felix re-usable cartridge prototype*



*Felix 'fast prototype' device, & single-use cartridge*



 Felix by  
Memphasys

## Prototype cartridge performance on healthy human ejaculate

Sample before treatment

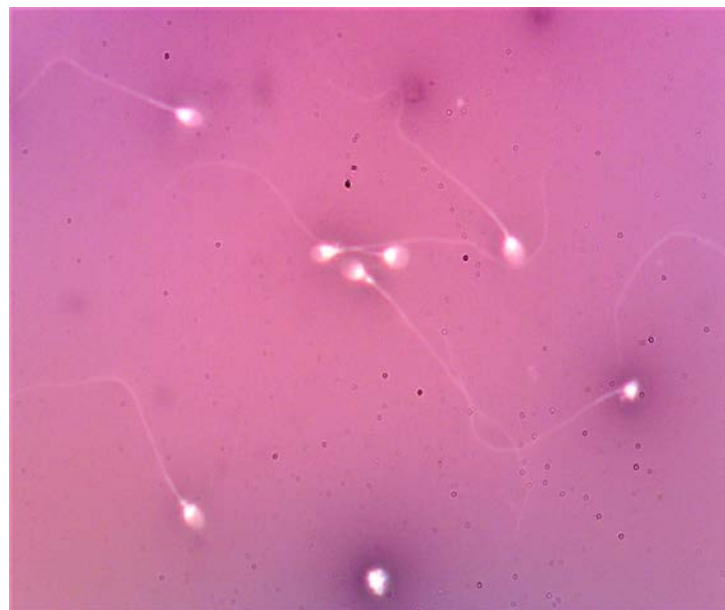


*Macrocephalic sperm  
(large head)*

*Dead sperm*

*Viable sperm*

After treatment - 6 minutes



- *Separation of viable sperm ; no debris*
- *Intact membranes and acrosomes*
- *Higher average motility*
- *Reduced DNA damage*

# Market Size: Human ART Market

- **ART Market size:**
  - Initial accessible market (IVF, ICSI): \$600 million (est)
  - Plus IUI<sup>1</sup> market: \$1.2 billion

Other Human ART Market Data	
<b>Couples with fertility issues</b>	>50 m
<b>Australian couples seeking 1VF treatments</b>	1 in 6
<b>IVF clinics globally</b>	~4,000
<b>IVF babies born per year</b>	~400,000
<b>IVF treatments market size 2012/2020</b>	US\$9.3bn /US\$21.6bn (F)
<b>No. cycles per year</b>	~6 million
<b>IVF consumables market</b>	US\$450m
<b>Consumables cost per IVF cycle</b>	\$400
<b>Av. cost to patient per cycle: developing/ developed countries</b>	~\$1,500/ ~\$10,000

Sources: Vitrolife Annual Report 2016, Industry interviews, ESRE, SART, ANZARD

<sup>1</sup> Intra-uterine Insemination



# Felix Commercialisation Plan

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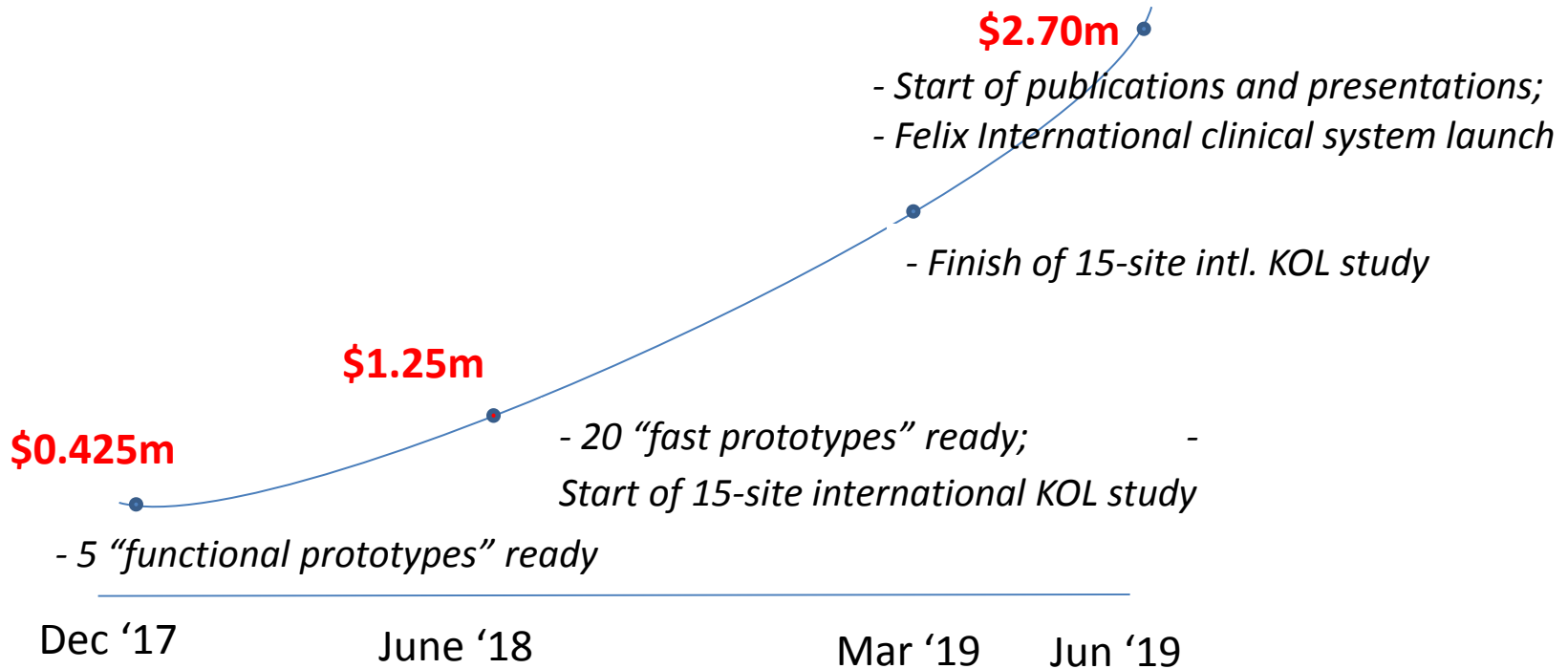
- Finish *in-vitro* testing of current cartridge by the 3\* Australian IVF centre partners
- Develop and commercialise “fast prototype” device (with disposable cartridge)
  - Build devices for in-vitro assessment by ~15 leading IVF centres in the world – US, EU, China
  - Oversee 6-month assessment program with these sites supervised by Prof Aitken
  - Obtain endorsement and early adoption by these Key Opinion Leaders (“KOL”s)
  - Obtain KOL publications/presentations from these sites to coincide with of market launch of reg-approved Felix clinical device
- Recruit national/ regional distributors
- Establish ‘fee for service’ revenue with single-use disposable cartridges.

\* Monash IVF Group, Westmead IVF and UNSW IVF

# Indicative Felix Key Milestones and Cumulative Costs

(Excludes corporate overheads and other R&D programs)

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## Corporate Statistics

- Shares on issue: 700m

<b>Top 5 Shareholders</b>	<b>% Holding</b>
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Andrew Goodall	33.8%
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Mark Gell	3.2%
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Bridge Road Capital	2.9%
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B Arthur Superannuation Fund	2.9%
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Stephen Gaffney	2.5%
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- Estimated funding required next 12 months: ~\$3m

<b>Anticipated Use of Funds</b>	<b>\$m</b>
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Felix development (Human ART)	\$1.5
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Other R&D & corporate overheads:	\$1.5
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- equine and bovine ART

- Other bio-separations