Memphasys

ASX: MEM

Commercialising The Felix Device:

A unique device to treat male infertility

Investor Presentation
March 2020

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Memphasys Value Proposition

- ✓ **Novel, proven technology for improved IVF treatment**
- ✓ **Addressing the significant global IVF market – anticipated to grow from ~US$13.7 billion in 2019 to ~$26.4 billion by 2026[1]**
- ✓ **First-mover advantage for unique bio separations technology**
- ✓ **Backed by industry experts and leaders in the field – including Global Fertility Expert Professor John Aitken**
- ✓ **Anticipated initial commercial sales in H2 CY2020[2]**
- ✓ **Progressing application for animals (such as horses, cows, pigs & sheep)**

1. Global IVF Services Market Revenue, By End User, 2018 – 2026, Global IVF Services Market Report – Allied Market Research (April 2019)

2. See ASX Announcement 19 December 2019

Key Milestones

Felix Cartridge in its foil packaging

- ✓ **Successfully raised A$4.2 million to support Key Opinion Leader (KOL) rollout with cornerstone support from major shareholders Andrew Goodall and prominent thoroughbred breeder and trainer Bob Peters in 1H CY'19**
- ✓ **Awarded 3 year A$549,452 ARC Linkage Grant for next gen products in conjunction with UNSW and Newcastle University**
- ✓ **13 KOLs from across Europe, North America, the Middle East, India and Australia secured for in-vitro assessments of Felix**
- ✓ **KOL assessment program underway**
- ✓ **Device Verification and Validation expected to be completed by mid CY20**

The Problem: IVF Technology insufficient to counter declining human fertility

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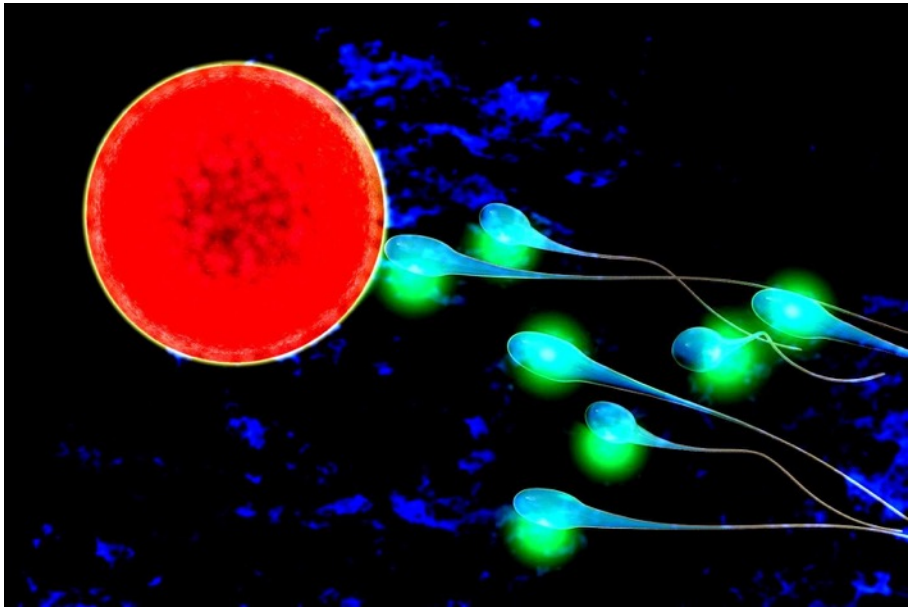
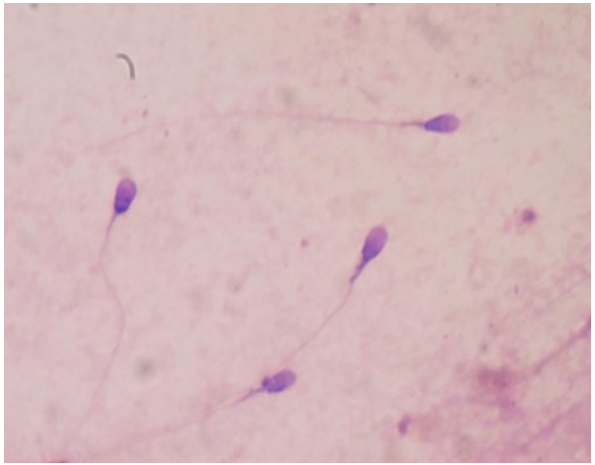


- Human IVF fertility rates in decline
- IVF expanding fast but success rate remains low
- Average of 2.2 IVF cycles before success but no guarantee of success
- IVF increases risk of miscarriage *and genetic impairment of offspring*

The Problem: Male Infertility

- Male infertility is a factor in approx. 50% of infertility cases
- Infertility increases with age
    - effects 1 in 3 men over 40 years old
- Male genetic defects also increase exponentially with age
- Sperm quality rather than quantity is the key concern
- No meaningful advances in sperm preparation treatments since the advent of IVF approx. 40 years ago



The Problem: Current IVF Methods

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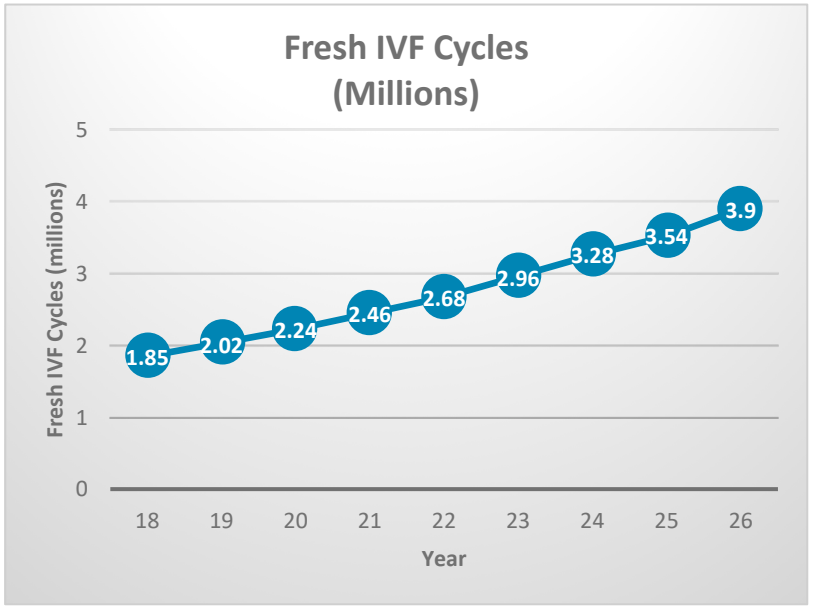
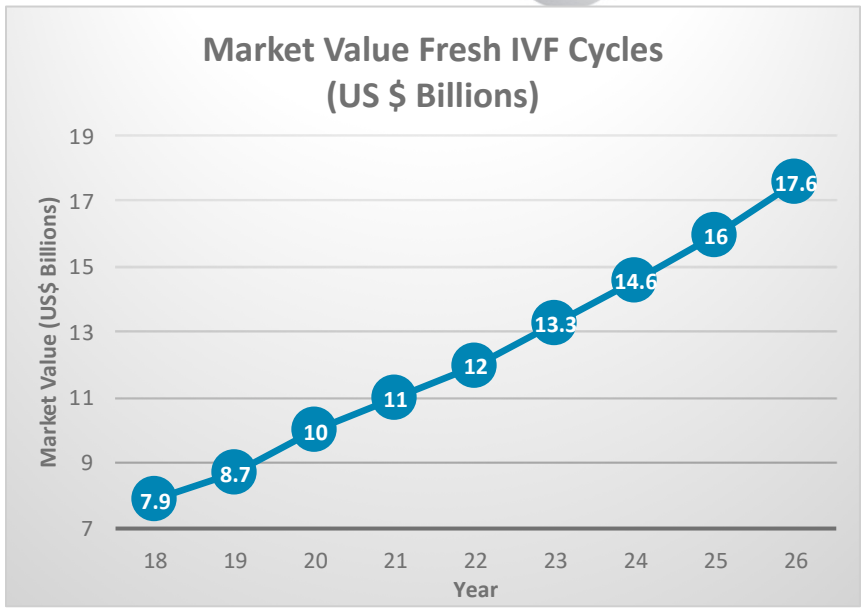
- **No standard method for preparing sperm for IVF**
- **Common techniques are:**
  - Swim-up
  - Density Gradient Centrifugation (DCG)

Or
Combination

- **Costs between A$80 to $100 (for each technique) per cycle**
- **Each method takes 30 minutes or more to complete**
- **Laborious process involving centrifuges, special media, extensive dexterity and expertise**
- **Process can inadvertently select DNA-damaged cells, reducing effectiveness and/or passing on genetic damage**

The Potential:
Rapidly Growing Human IVF Market





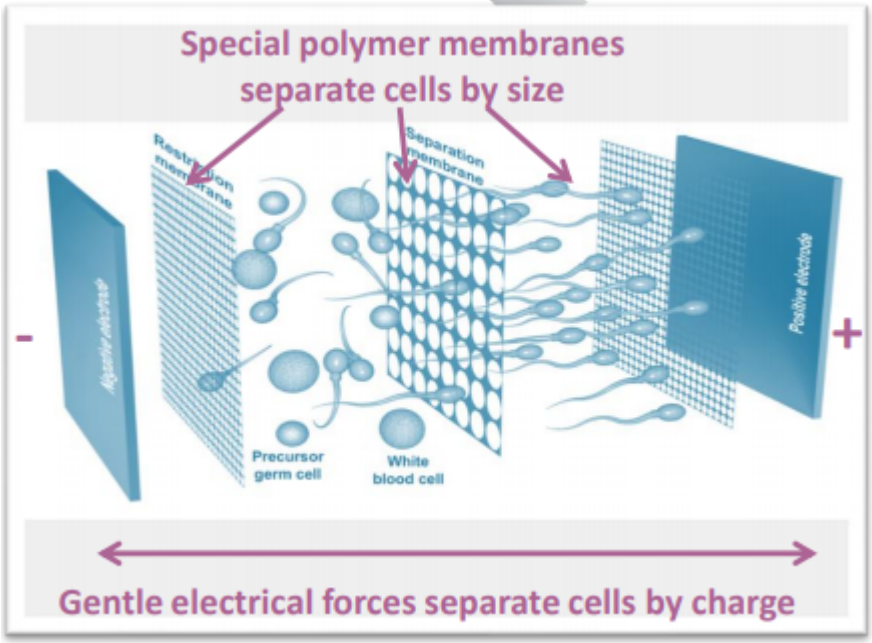
Global IVF Services Market Revenue, By End User, 2018 – 2026, Global IVF Services Market Report – Allied Market Research (April 2019)

A Solution: Memphasys Felix Device

- A world-first technology to separate best quality sperm with potential to increase:
  - The likelihood of pregnancy
  - Live birth
  - Having a healthy baby
- Quick, efficient and operator independent (6 minutes, fully automated)
- Uses patented intellectual property

How Does the Felix Device Work?

- **Gentle electric force applied to cartridge sample**
- **Best quality (negatively charged) sperm* attracted to positive electrode**
- **Sperm separates through polymer membranes to:**
  - Separate by their cell size
  - Eliminate white cells & other debris



** Indicative of properly functioning DNA which has instructed the cell to form a cytoskeleton with an intact cell membrane.*

Semen sample before and after Felix treatment

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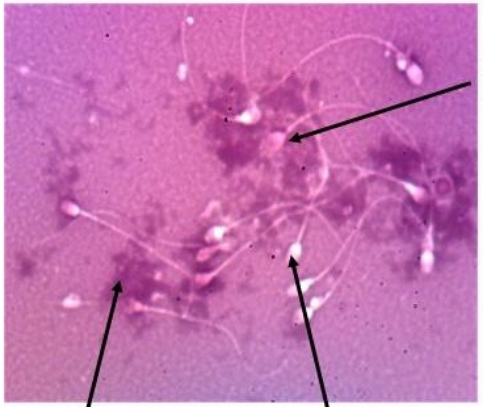
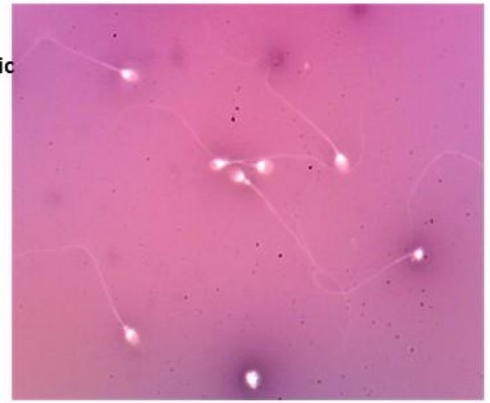
Prototype cartridge performance on healthy human ejaculate

Sample before treatment



After treatment - 6 minutes



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

Developed With Global Fertility Expert Professor John Aitken

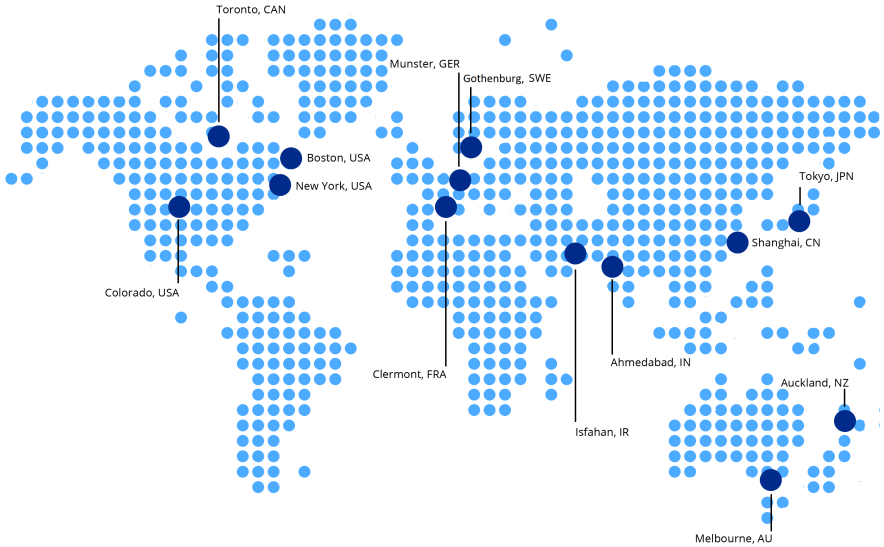
To view full interview go to: www.memphasys.com

Current Activities:
KOL Assessment Program

- **Key Opinion Leaders (KOLs) are international leading andrology centres and laboratories in the IVF industry**
- **Selected for**
  - technical and academic expertise
  - geographic market positioning
  - value to commercialisation strategy
- **Each organisation is undertaking assessment of the Felix device**
- **Assessment is under strict protocols, with results anticipated to assist accelerate commercial sales in strategic markets**

Geo-location of KOLs

- Currently 13 KOLs* are taking part in in-vitro assessments of the Felix device
- In discussions with further high-reputation organisations in strategically important locations



Memphasys is rationalising the no. of initial KOL sites, with the Italian site and the second Swedish site to join the program later.

KOL Program Underway

- Further devices (cartridges and consoles) for the KOL assessment program are in production with devices already received by 6 KOLs: Japan, India, Canada, USA, Iran and China.
- Further devices and cartridges to be delivered to remaining KOL sites in current HY
- Provides ready-made potential initial customer base ahead of commercialisation
- Outcomes to provide feedback on device performance on real clinical samples with a range of fertility issues

KOL Feedback To-Date

- **Highly positive initial feedback from the KOLs**
- **Testing delivered:**
  - ✓ Successfull separation of sperm from samples
  - ✓ Improved average progressive motility
  - ✓ High speeds, faster than swim-up/DGC
  - ✓ Easy to Operate
- **Protocol A assessments at these and remaining KOL sites to occur shortly**

Memphasys MD Alison Coutts attending completion of initial Felix device testing at Japanese KOL

Pathway to Market

- **Commercial sales expected to occur in mid to late CY2020, following V&V [1, 2]**
- **Initial commercial pathway to focus on selected countries aligned to the Company's objectives to get early sales in relatively low regulatory markets**
- **Countries include:**
  - **Japan**
  - **India**
  - **Canada**
  - **New Zealand**

1. Device verification and validation processes, which are required before the device can be commercially available

2. Subject to meeting any requisite legal and regulatory certifications and gaining market support by KOLs in specific targeted jurisdictions for the use of the Felix device in their clinics/ andrology centres

Most likely initial markets

Country	Fresh IVF cycles in 2018	Expected fresh IVF cycles by 2026	% growth rate	KOL engaged in market
Japan	269,110	699,110	**+160%**	✓
India	169,800	489,840	**+188%**	✓
Canada	6,360	21,140	**+232%**	✓
New Zealand	5,300	11,190	**+111%**	✓

Global IVF Services Market Revenue, By End User, 2018 – 2026, Global IVF Services Market Report – Allied Market Research (April 2019)

Memphasys' Business Model

- The device consists of a console and single use cartridges
  - The console supplies the electricity and operates the device
  - The cartridges contain the cell separation technology
- When the device is sold commercially, IVF practitioners will require an ongoing supply of cartridges
- Cartridges are single-use per cycle and are positioned to be the source of recurrent revenue

Assisted Reproduction: Strategic Focus

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Human ART

- The major focus is to commercialise Felix and to launch it into the human IVF market.

Animal ART/AI

- The parallel and growing focus is positioning to scale up the device for artificial insemination (AI) for selected livestock.

Assisted Reproduction Applications for Livestock

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- The current human device, with minor operating modifications, could be used for Intra Cytoplasmic Sperm Injection ("ICSI") procedures in certain livestock e.g. horses
- Currently this is a niche market for only extremely high value animals
- Memphasys is aiming to design a new scaled up device to prepare sperm for AI, the main way that assisted reproduction is commercially performed in livestock*
- AI requires much greater quantities of viable sperm than the amount required for ICSI

*AI is illegal in thoroughbred racing horses but can be used on other horses (ie polo, equestrian, etc) .

Assisted Reproduction Applications for Livestock (cont.)

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- **To improve the efficiency of separation and cope with the much greater volume required for artificial insemination:**
  - Memphasys is engaging with micro-fluidic bioreactor design specialists at the UNSW to do real time imaging of sperm fluid flow under an electric field and to model fluid dynamics of current and future cartridge designs
  - Memphasys is also starting to develop new prototypes inhouse with different configurations and fluid flows

Equine AI: The Initial Livestock Focus

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Rationale for choosing equine AI as the initial focus:

- **The current Felix human device, with minor operating modifications, has been proven to work on small quantities of equine semen**
- **Although AI is illegal in thoroughbreds, there is a large market for equestrian AI**
- **Pregnancy rates are relatively poor (about 60%) from equine AI**
- **Uni Newcastle has particular equine biological knowledge and access to pony semen samples**
- **Horses would be a useful animal model for the next generation device with potential application to a wide range of animals (e.g. cows, sheep and pigs)**
- **It could also provide the basis for a next gen. Felix device**

Corporate Snapshot

ASX Code	MEM
Share price (as at 3/3/2020)	$0.06
Shares on issue	753.97 million
Market capitalisation	$45.24 million
Cash & Cash Equivalents (as at 31/12/2019)	$3.8 million
Ownership structure – substantial shareholders (as at 31/01/20)	Peters Investments 27.2% Mr Andrew Goodall 22.7% Ms Alison Coutts 10.6%

MEM Share Price for last 12 Months

Source: ASX website

Appendices: Board of Directors

Alison Coutts – Executive Chairman

Former Chair of CSIRO Health Sector Advisory Council

Chemical Engineering degree and MBA

Co-founder of eG Capital, assisting in biotech IPOs and secondary raisings

Marjan Mikel – Non-Executive Director

Founded Healthy Sleep Solutions, which attracted Resmed (NYSE:RMD) as JV partner

Andrew Goodall – Non-Executive Director

Serves on the Company's Audit and Risk, and Nomination and Remuneration Committees

Shane Hartwig – Non-Executive Director

A CPA and is Chartered Company Secretary with more than 20 years' experience in finance

Founder of Peloton Advisory corporate advisory firm

Investment Highlights

- ✓ Potential to counteract male infertility and disrupt IVF industry
- ✓ International commercial product roll out from mid-late CY2020
- ✓ Significant growing market - predicted to be valued at ~$26.4 billion by 2026
- ✓ Backed by major industry partners
- ✓ Executive performance scheme aligned to commercial outcomes

Appendices: Intellectual Property

Memphasys and/or Uni Newcastle hold patents relating to:

- Specific cell separation technologies
- Specific sperm separation technologies[1]

Patents pending:

- Electrophoresis apparatus design for sperm fractionation
- Hydrogel membranes

1. Exclusive, perpetual license from Uni Newcastle

Thank you

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