

Improving IVF treatment outcomes using microfluidic technology

Providing micro and nano fabrication facilities for Australia's researchers, students and industry

Poised to increase IVF treatment success rates, a team of leading Australian researchers have developed an automated microfluid platform to standardise complex in vitro fertilisation (IVF) processes.

Suli Yagoub is a PhD candidate in Adelaide University's Reproductive Success team working under Prof Jeremy Thompson and Dr Kylie Dunning.

Together with Prof Brant Gibson from RMIT University, Prof David Gardner from University of Melbourne and support from the South Australian node of the Australian National Fabrication Facility, Suli and his team have designed and fabricated a novel micro housing device for use by embryologists.

The platform supports a standard, yet dynamic system, enabling embryologists to culture embryos to the desired stage of development using a computer-monitored microfluidic pump to control the micro environment.

Suli said the team were excited to discover that minimising direct handling of the embryos reduced stress incurred by current IVF practices.

"We realised our device could be used as a training module for embryologists and that other fields could also benefit, like pharmacology, microbiology... the list keeps growing!" said Suli. "Our team immediately thought of commercialising the technology and we quickly acquired investors."

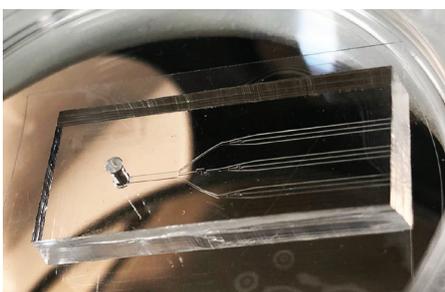
A former embryologist in a human IVF clinic, Suli is acutely aware of Australia's infertility statistics, with one in six couples affected. His research will benefit IVF centers around the world by increasing the success rate and reducing the psychological and financial costs on patients, who often undergo multiple IVF

treatments, to start a family.

In July 2019, Suli attended ANFF-SA's Microengineering Winter School where he participated in lectures and practicals to enhance his understanding of micro and nano fabrication before undertaking training in microfabrication with the ANFF-SA team.

He said accessing ANFF-SA's fabrication facilities gave him a new scope and unlimited solutions to achieving what he never imagined could be achieved.

"Thanks to ANFF-SA's Microengineering Winter School, I was able to apply my learnings to my research and I wouldn't have been able to achieve all of this without attending their program," said Suli.



Combining reproductive biology, physics, chemistry and engineering, Suli's multidisciplinary research requires him to think outside the box.

He credits his improved skills in microfluidics, fabrication and 3-D modelling to ANFF-SA's staff whose 'knowledge and expertise in fabrication and microfluidics is incomparable' and he has 'never seen better facilities than ANFF-SA, thus far'.

Suli said ANFF-SA has supported his research with one-on-one training with highly skilled staff and access to the cleanroom to fabricate his own PDMS microfluidic devices.



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...ANFF-SA prove to be an asset that could bridge every field and provide solutions for every problem.

**Suli Yagoub, PhD Candidate,
Adelaide University** ”

"ANFF-SA have supported me with my designs, provided insightful advice that allowed my research to progress faster than anticipated and made sure I have access to all the resources available for me to get the best results," said Suli.

"Without a doubt, ANFF-SA prove to be an asset that could bridge every field and provide solutions for every problem."

Co-located at the University of South Australia and Flinders University, ANFF-SA specialises in microfluidics, organic electronics, biomaterials, novel semiconductor materials and characterisation.

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South Australian Node of the Australian National Fabrication Facility

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