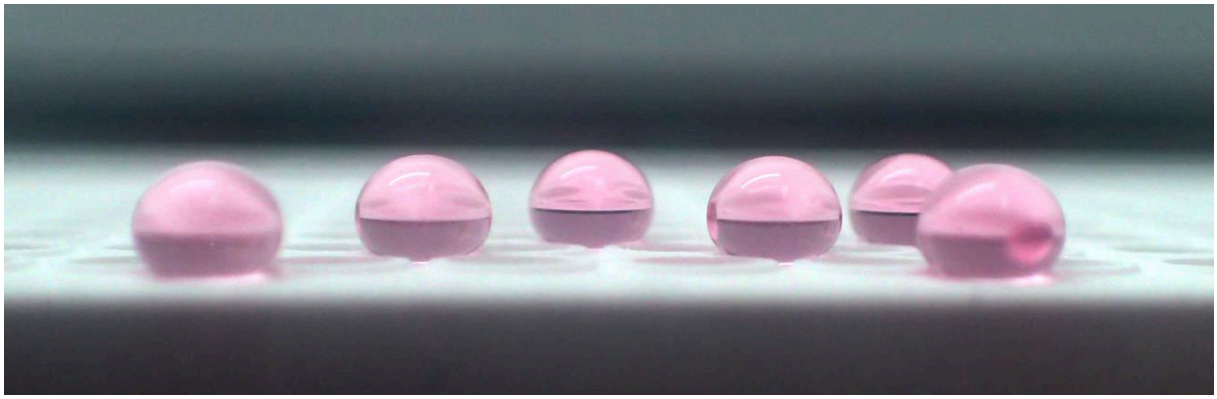
Naked Liquid Marbles Cell Culture



Superhydrophobic coating of cell culture vessels for 3D cell culture

Three-dimensional (3D) cell cultures have been an area of increasing interest and relevance, specially in drug discovery, developmental biology and stem cell-based therapies. However, flat glass or hard plastic surfaces used to grow cells do not represent the environment found within tissues and organs and can induce unwanted changes in the cultured cells. In contrast, cells cultured in three-dimensional conditions are permitted to grow in all directions, promoting their interaction with neighbouring cells, which can more closely mimic the *in vivo* state than conventional 2D cultures. A variety of methods to generate spheroids currently exists, most requiring specialised cell-culture equipment.

The Technology

Superhydrophobic surfaces are characterised by extremely high water-repellence, and typically exhibit a water contact angle $\theta > 150°$. We have applied a superhydrophobic coating to cell culture microplates to produce a system which produces spherical balls of medium size without the need for a hydrophobic coating of the cell culture droplets - naked liquid marbles (NLM). Cells grown in NLM can freely and rapidly associate to form multiple 3D cell spheroids with excellent characteristics and viability. This novel NLM cell culture system can be utilised in a standard incubator, without the need for any specialised equipment. The plate surface coating can be easily applied to any cell culture vessel.

The Team

The NLM method was developed by the team of A/Prof James St John within the Clem Jones Centre for Neurobiology and Stem Cell Research at Griffith University's Griffith Institute for Drug Discovery (Brisbane, Queensland, Australia). It was devised to advance the Spinal Injury Project that is developing a cellular therapy for spinal cord injury.

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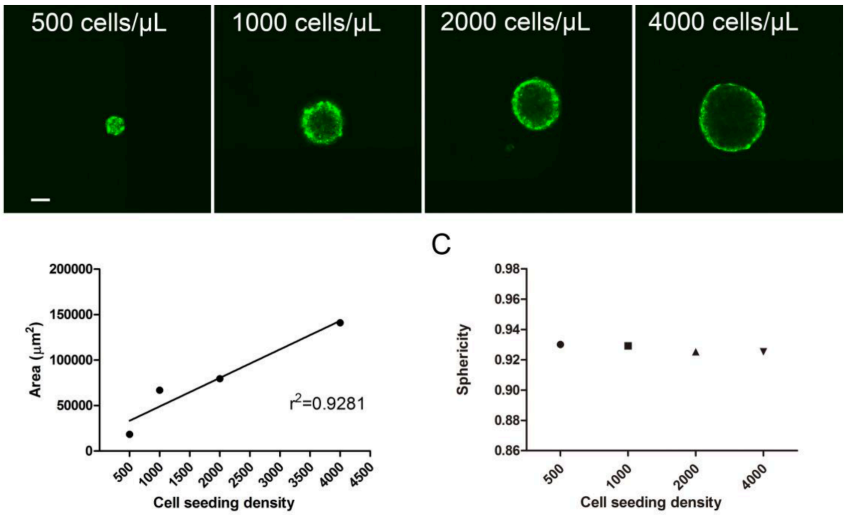
170 Kessels Road, Nathan, 4111, Qld, Australia
(07) 3735 5489 | griffith.edu.au/griffith-enterprise

The therapeutic approach transplants cells from the nose into injured spinal cords to form a cellular bridge, enabling the regeneration of nerve cells to establish functional motor and sensory connections.

Status of Development

Prototype superhydrophobic cell culture vessels have been created and are routinely utilised in A/Prof St John's laboratory to grow 3D olfactory cell cultures. A large dataset is available on request.



The Intellectual Property

Griffith University has filed an Australian Provisional Patent in November 2017 (AU 2017904456 "Cell Culture System"). The University has full rights to the invention.

The Offer

Griffith University is seeking to partner the coating technology with companies that have the capabilities to produce and bring to market a variety of superhydrophobic cell culture vessels. We are offering a license to the intellectual property and relating know-how.

Point of Contact

Interested parties are encouraged to contact Dr Jens Tampe, Deputy Director, Griffith Enterprise.

Tel +61 7 373 54527
Mobile +61 434 315 455
Fax +61 7 3735 5516
Email j.tampe@griffith.edu.au
skype: jens_griffithenterprise

Building N54, 1.06
Griffith Enterprise
Griffith University, Nathan campus
170 Kessels Road, Nathan, Qld 4111
Australia

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