

ASX Announcement ([ASX: AXE](#))

5 November 2020

Archer's A1 Biochip™ development commences

Highlights

- Archer commences its A1 Biochip™ development with the aim of building a lab-on-chip biosensing device capable of simplifying disease detection.
 - The A1 Biochip™ is being built by the Archer team in a world-class semiconductor chip prototyping foundry.
 - Archer is working with a German biotech company to explore the on-chip conversion of in-demand commercial diagnostics.
 - Lab-on-chip devices form part of the global multibillion dollar biotech economy, catalysed by advances in point of care diagnostics and testing¹.
 - Archer owns all the IP associated to the biochip technology, and the Company is prosecuting related international patent applications.
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Archer Materials Limited (“Archer”, the “Company”, “[ASX: AXE](#)”) is pleased to announce the Company has commenced building a [lab-on-a-chip](#) device (“biochip”) named **A1 Biochip™**.

Archer has made a step-change in advancing its graphene-based biosensor technology development to newly commence its lab-on-a-chip A1 Biochip™ project. This was possible in a short period of time as Archer brought its biotechnology development in-house and is now able to miniaturise its biosensing processes to chip-formats while retaining its IP.

Archer will be designing and building its own biochip which means that the Company no longer requires prototyping sensor materials, graphene inks, 2D/3D printing, or circuit boards (manufactured in Asia) (ASX Ann. [31 Aug 2020](#)). Developing the biochip in-house should allow Archer to accelerate commercialisation of the biochip.

Commenting on the A1 Biochip™ development, Archer CEO Dr Mohammad Choucair said: “It is a global challenge to develop innovative biodevices that make the complex detection of disease safer and more reliable. Archer’s A1 Biochip™ technology aims to simplify disease detection at the point of care to potentially address an emerging multibillion dollar industry.

“Archer’s biochip development involves miniaturising medical lab tests onto an integrated circuit, a single chip, that is only a few millimetres in size. This is incredibly difficult, and there are very few people the world that can do this type of work, however Dr Soffe has already made exciting advances on this front in only a few weeks since joining Archer”.

Archer's A1 Biochip™

The first componentry of Archer's A1 Biochip™ is shown in Image 1. Key features include the on-chip microfluidic channels that allow for gas or liquid sampling (typical biological specimens) and the miniaturised electrodes for the biosensing areas (microfabricated using gold and titanium).

Biochip development will involve designing these components for further miniaturisation (micron to nanoscale), **and are intended to incorporate graphene materials**; both aspects which are required to validate commercial advantages of ultra-sensitivity and device integration.

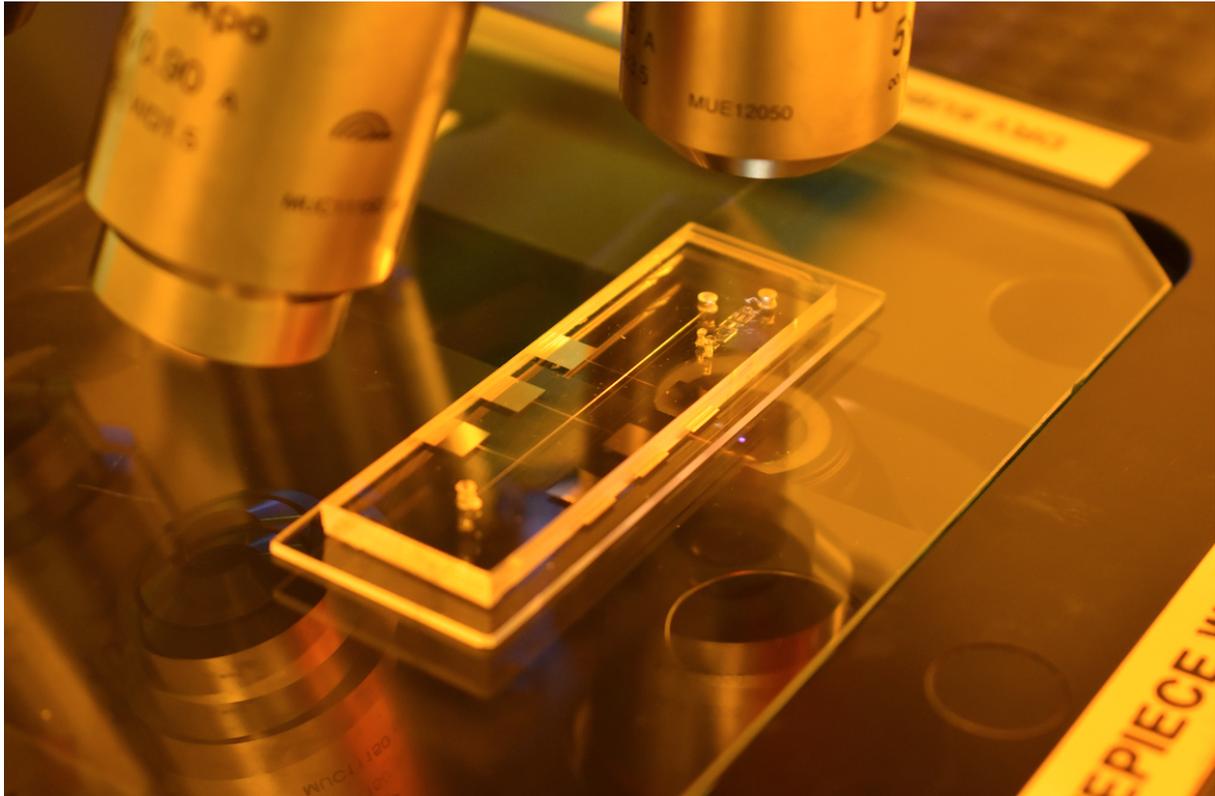


Image 1. Building Archer's A1 Biochip™. Archer's biochip development involves miniaturising medical lab tests onto an integrated circuit, a single chip, that is only a few millimetres in size. The chip includes a number of functional areas and componentry, including microfluidic channels and active biosensing areas – all smaller than the thickness of a human hair.

Miniaturising and integrating a lab-on-chip device also provides improved accuracy and a substantial decrease in the time required to obtain a diagnostic test result, which are key commercial barriers to point of care medical diagnostic disease testing. Specifically:

- + Archer's biochip componentry and design solves for sample evaporation challenges and substantially overcome limitations in fabricating the active sensing areas to meet miniaturisation requirements for viable disease detection.
- + The biochip microfluidics allow sample sorting, preparation, and handling – all on-chip. Sample volumes as small as 3 microlitres ("µL") can be used – comparable to the volume of a tear drop (6-7 µL) or blood droplet (50 µL) – which is more than 1000 times less than the volume taken for a regular blood test (3-10 mL).

Archer streamlining its go-to-market strategy

A new commercial agreement now allows Archer to access the world-class semiconductor chip prototyping foundry (“Foundry”) for all its technology development. The Company’s biochip development is led by Dr Rebecca Soffe (ASX Ann. [10 Sept 2020](#)) (Image 2). Archer has begun building its biochip in the Foundry alongside its ¹²CQ quantum computing chip development.

Archer has worked with its German Biotech partner to 3D print human antibodies (e.g. Human IgG) (ASX Ann. [15 Apr 2019](#)) which are relevant biomolecules in the immune system response caused by certain diseases, including respiratory diseases like COVID-19. The Company intends to translate this knowledge to its biochip development, and will continue exploring potential on-chip conversion of current diagnostics with the German Biotech teams.

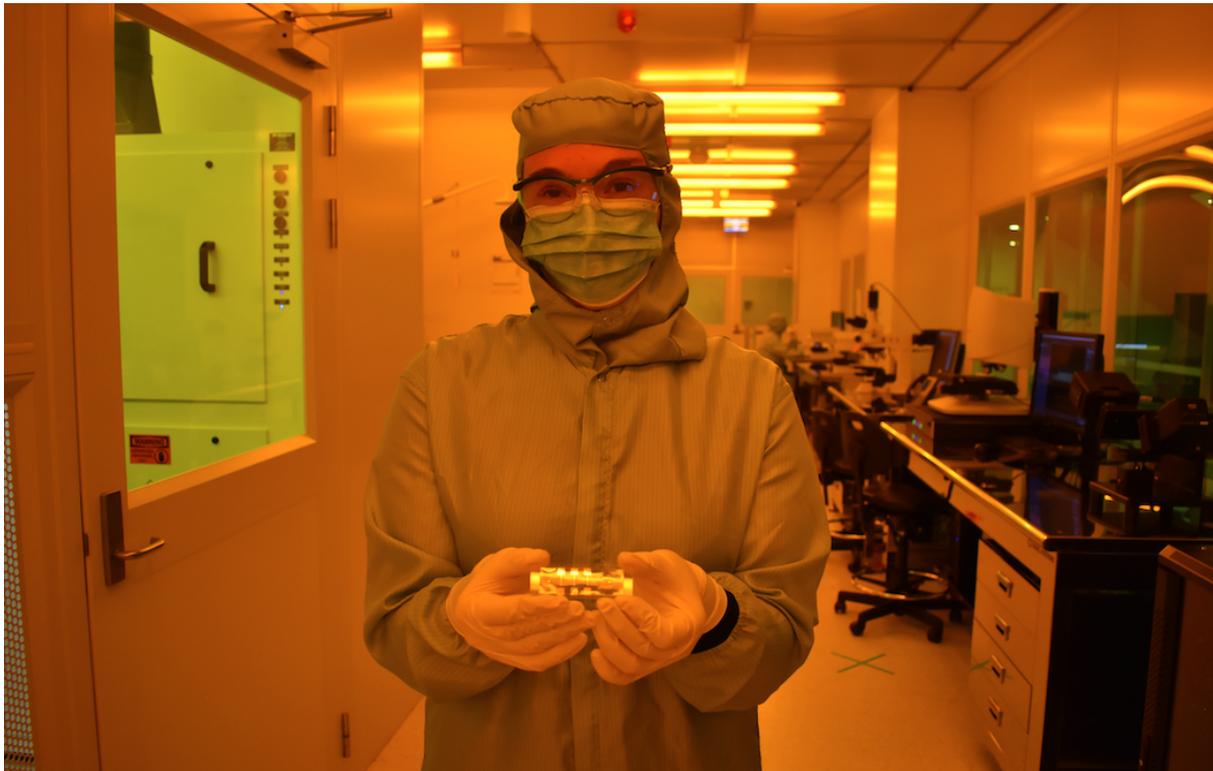


Image 2. Dr Rebecca Soffe fabricating the A1 Biochip™. Archer works in a world-class semiconductor chip prototyping foundry to build devices and validate its technology.

Biochip development to accelerate Archer’s transition to a pure-play deep tech

Archer will work with its German Biotech partner to determine potential candidate biomolecules relevant to in-demand disease diagnostic tests, as part of the commercial development of Archer’s A1 Biochip™.

The immediate next technology validation steps will be performed in the Foundry, and focus on translating the biochip components onto silicon wafers. This is important as it would enable the possibility of high volume chip production and integration onboard electronic devices – both required for any future retail applications of the A1 Biochip™.

About Archer

A materials technology company developing innovative deep tech in quantum computing, biotechnology, and reliable energy. The Company has strong intellectual property, world-class in-house expertise, a unique materials inventory, and access to Tier 1 technology development infrastructure.

The Board of Archer authorised this announcement to be given to ASX.

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¹ <https://media-publications.bcg.com/BCG-The-Dawn-of-the-Deep-Tech-Ecosystem-Mar-2019.pdf>