

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

27 August 2024

Archer begins experiments to test for chronic kidney disease on its Biochip gFET sensors

Highlights

- Initiating experiments for Archer's Biochip gFET sensors to detect potassium, a key element for testing chronic kidney disease.
 - Testing of gFETs from a provider using directly grown graphene surfaces has shown stability in air without degradation over a two-month period.
 - Testing has also proved device repeatability and superior sensing performance retention.
 - Builds on the previous progress achieved where transferred graphene was protected from degradation with ultra-thin films.
 - Archer is targeting first demonstrator data – the initial step to initiate development of at-home sensing and monitoring of elements like potassium for renal patients.
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Archer Materials Limited ("Archer", the "Company", "ASX: AXE"), a semiconductor company advancing the quantum technology and medical diagnostics industries, has begun experiments to ultimately detect and monitor chronic kidney disease on its Biochip graphene field effect transistor ("gFET") sensors.

Archer, through one of its foundry partners, has verified a process that directly grows graphene surfaces to produce superior devices, rather than transferring the graphene to a device from a wafer, as previously done. The team has tested the devices by storing them in normal air conditions over a two-month period, finding no significant degradation in performance.

Archer can now prepare the graphene surfaces (without degradation) with molecules that are selective to targets it aims to sense. Initial experiments show that the team can decorate the devices with species that will selectively bind with atoms, or ions like potassium, an important chemical in monitoring chronic kidney disease patients.

This builds on previous work done by the team through protecting transferred graphene (the more common method of producing wafers of graphene) with ultra-thin films to allow sensors to be stored in air without suffering degradation. This addresses the common concern where devices are not stored in a nitrogen-controlled environment or in vacuum, they normally degrade and eventually cannot be used. This poses a difficult storage problem for commercial devices built in such technology.

The growth process is proprietary but is based around a traditional semiconductor process known as molecular organic chemical vapour deposition ("MOCVD").

The processes that Archer is testing are scalable to a high-volume manufacturing environment and allow the Company to maintain the high sensitivity of the as-fabricated gFET devices.

In coming months, Archer will build on this initial work to produce first demonstrator data on detection of relevant ions in liquid – the initial step to initiate development of at-home sensing and monitoring of elements like potassium for renal patients.

Commenting on the gFET development, Greg English, Executive Chair of Archer, said,

“Archer has reached an important step in the development of its Biochip acting as a Lab-on-a-chip that detects and analyses liquid disease samples through the testing of its first disease, chronic kidney disease.

“The Biochip team has continued to build on work where the graphene surfaces do not suffer from degradation, which has brought Archer to this point, allowing it to test for potassium.

“This milestone is significant in Archer’s mission to help improve accessibility to healthcare through its Biochip by integrating it on mobile electronic devices.”

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

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About Archer

Archer is a technology company that operates within the semiconductor industry. The Company is developing advanced semiconductor devices, including chips relevant to quantum computing and medical diagnostics. Archer utilises its global partnerships to develop these technologies for potential deployment and use across multiple industries.
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