

ASX Announcement (ASX:AXE)

27 September 2018

## MTA signed with German biotech for graphene-based biosensor technology

### Highlights

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- Archer has entered into a legally binding Material Transfer Agreement (MTA) with a leading German biotechnology company (the “Partner”) for the development of an electrochemical biosensor made using printable graphene components, capable of detecting diseases.
  - Printable graphene components are derived from Archer’s Campoona graphite deposit, as part of the collaboration agreement between Archer and The University of Adelaide ARC Graphene Hub, which is focused on the development of carbon-based biosensors.
  - The MTA will allow a study to be performed using in vitro diagnostic products available to Archer and the Partner for infectious disease serology, while the collaboration with The University of Adelaide ARC Graphene Hub will continue to focus on biosensing componentry R&D.
  - Archer and the Partner will seek to jointly identify technology gaps in key sensing componentry to service niche segments of the global biosensor market, which is expected to grow to US\$27 billion by 2022<sup>1</sup>.
  - Archer and the Partner intend to progress the MTA to an exclusive Collaboration Agreement in the near term.
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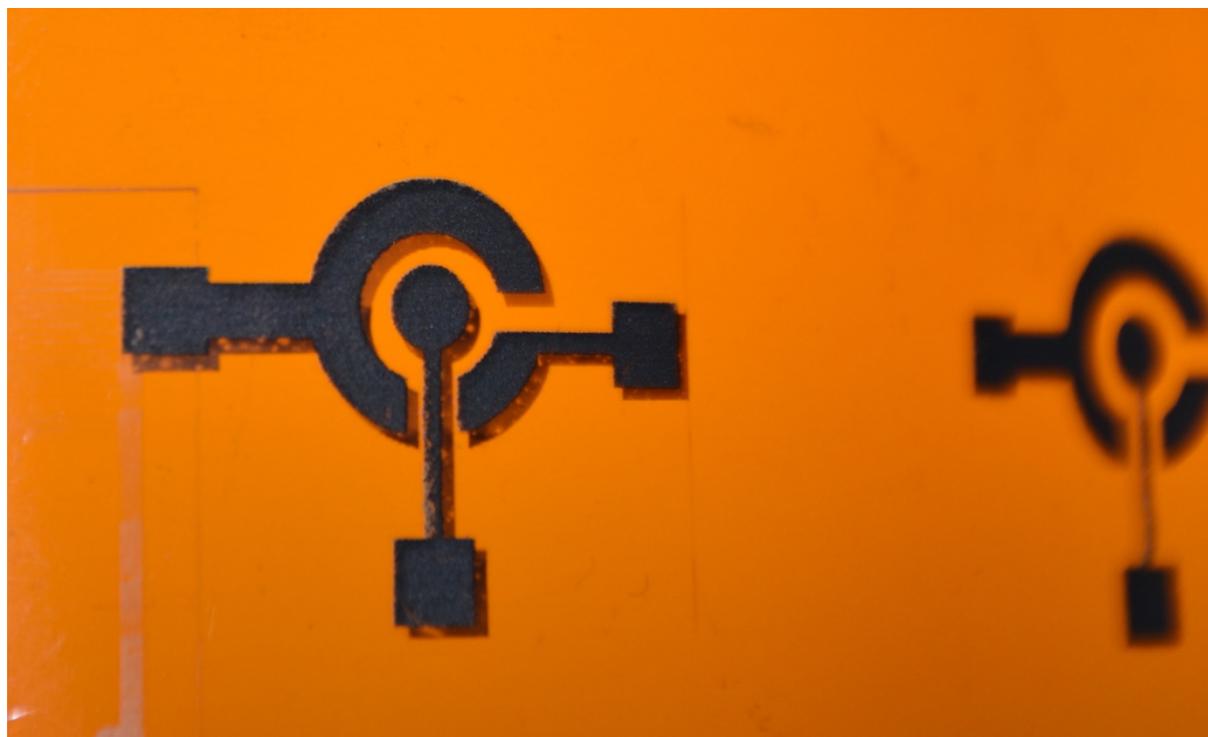
Archer Exploration Limited (“Archer”, the “Company”) (ASX:AXE) is pleased to announce that it has entered into a legally binding Material Transfer Agreement (“MTA”, the “Agreement”) with a leading German biotechnology company (the “Partner”), in relation to Archer’s graphene-based biosensor development activities with The University of Adelaide ARC Graphene Hub.

The Agreement involves the transfer of materials between Archer and the Partner for use in the development of electrochemical biosensors for the semi-quantitative detection of disease state markers. The materials to be used (“Original Materials”) include those held in the inventory of the Partner (e.g. infectious disease antigens, antibodies, disease state sera, coupling and assay reagents) and materials in the inventory of Archer’s wholly owned subsidiary Carbon Allotropes (e.g. graphene, ink formulations, and printed graphene electrodes) (Fig. 1).

The Agreement is currently non-exclusive; however, Archer and the Partner intend to progress to an exclusive Collaboration Agreement in the near term. Due to the non-exclusive nature of the MTA, it should be noted, that to avoid circumvention, the company name of the Partner has not been stated.

The Agreement aims to contribute towards fabricating a proof-of-concept biosensor, comprising printable components capable of detecting disease state markers, such as antibodies or antigens. The Partner specialises in commercial biological detection technology and materials, and is concurrently developing and improving biosensing technology for emerging markets. The ownership of any intellectual property developed during the performance of the Agreement using the Original Material, will be subject to negotiations between Archer and the Partner on a good faith basis.

**Commenting on the MTA, Archer CEO Dr Mohammad Choucair said:** “This represents the first opportunity for Archer to work collaboratively with a reputable European, customer facing biotech company. In a short period of time, we have leveraged the positive outcomes of our collaboration agreement with the ARC Graphene Hub, to progress our strategy in the key focus area of human health. We are confident that we can rapidly progress our biosensor development towards markets that target the use of infectious disease detection”.



**Fig. 1.** Printed graphene electrodes developed using graphene-based conductive inks derived from Archer’s Campoona graphite as part of the collaboration with The University of Adelaide ARC Graphene Hub. Archer and the Partner will use the electrodes as key componentry in the development of a biosensor that can detect diseases.

## Next Steps

As the next steps in progressing the MTA, Archer will work with the Partner to identify technical and commercial avenues that address technology gaps in the biosensor market and are able to be serviced by low cost and multi-modal biosensing devices. A study is to be performed using in vitro diagnostic products available to the Partner for infectious disease serology, that aid in the diagnosis of viral, bacterial, parasitic and fungal diseases, while jointly assessing and optimising the graphene and graphene ink biosensor componentry performance.

The collaboration with The University of Adelaide ARC Graphene Hub will continue with the aim of contributing to the development of a functional in vitro electrochemical carbon-based biosensor. The value-add development involves Archer's direct access to infrastructure and personnel to prepare graphene-based materials, including functional derivatives like inks, needed for processing complex biosensing componentry and characterising these materials to determine biocompatibilities that lead to molecular sensing.

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### **Background and Market Summary**

Graphene inks and printed graphene electronic device products are set to service niche segments of the global biosensor market, which is expected to grow to US\$27 billion by 2022<sup>1</sup>, and itself forms a niche segment of the US\$328 billion global biotechnology market<sup>2</sup>. The main challenge to achieve widespread adoption of graphene materials has been in developing high-volume and high-value integrated devices and technologies that can be efficiently and effectively scaled, with potential solutions spanning additive manufacturing, and highly processable and printable devices. Biosensors have targeted applications servicing various market segments including medical testing, food toxicity, industrial processes, and environmental and agricultural testing. The three key components to biosensors include the electrode, analytes, and technology interface. Medical detection applications include the detection of cholesterol, blood glucose, blood gases, pregnancy, infectious diseases, and drugs.

### **About Archer Exploration**

Archer provides shareholders exposure to innovative technologies and the advanced materials that underpin them. The Company has a focused strategy targeting globally relevant advanced materials markets of human health, reliable energy, and quantum technology. Archer is well positioned to execute on its strategy.

### **About The Partner (German Biotech)**

The Partner is a German based company with over 110 employees and has evolved over the last 40 years into a highly reputable in vitro diagnostic medical device (IVD) manufacturer, with one of the largest portfolios for diagnosis of infectious disease in the world. Based on extensive expertise in manufacturing of high-quality antigens, the Partner has also become a major supplier of raw materials to the diagnostic industry. The Partner focusses on two core competences: the development, production and marketing of high quality IVDs for infectious diseases, and the supply of infectious disease raw materials, including antigens, antibodies and plasma products.

### **About The University of Adelaide**

The University of Adelaide ARC Graphene Hub supports the commercialisation of graphene research in a partnership of four Australian Universities and a number of industry partners. The collaboration with The University of Adelaide's ARC Graphene Hub was Archer's first targeted efforts to capture solutions with Archer's graphite and graphene materials. Graphene-based conductive inks derived from Archer's Campoona graphite have since been developed with The University of Adelaide's ARC Graphene Hub (ASX Announcement 30 July 2018), using a combination of publicly available and propriety methods. The inks took advantage of Archer's materials' properties and were used to print electronic circuits on transparent and flexible

substrates that function as basic bio-electrochemical sensing device componentry. The collaboration is expected to result in fabrication of all functional elements of a versatile in vitro electrochemical carbon-based biosensor.

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## Shareholders

For more information about Archer's activities, please visit our:

Website:  
<https://archerx.com.au/>

Twitter:  
<https://twitter.com/archerxau?lang=en>

YouTube:  
<https://www.youtube.com/watch?v=4HFfa3TVa28>

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<sup>1</sup>Markets and Markets 2017, Biosensors Market by Application (POC, Home Diagnostics, Research Labs, Biodefense, Environmental Monitoring, Food & Beverages Industry), Technology, Product (Wearable and Non-Wearable), and Geography - Global Forecast to 2022, accessed 19 March 2018, <https://www.marketsandmarkets.com/Market-Reports/biosensors-market-798.html>

<sup>2</sup>IBIS World 2017, Global Biotechnology - Global Market Research Report, accessed 19 March 2018, <https://www.ibisworld.com/industry-trends/global-industry-reports/business-activities/biotechnology.html>