SIGNIFICANT BREAKTHROUGH IN CONTROL OF RESISTANT MALARIA MOSQUITOES

- **Flavocide™ activity confirmed against Malaria carrying mosquitoes that are resistant to Synthetic Pyrethroids (SP); the insecticide class commonly used since the 1970's to control mosquitoes**
- **Malaria kills over 400,000 people annually and an estimated 228 million cases occurred worldwide in 2018**[1]
- **Laboratory efficacy studies completed at Purdue University demonstrate Flavocide toxicity by tarsal contact indicating potential for use in insecticide treated bed nets and/or indoor residual sprays; the most common methods of controlling Malaria**
- **Trial results validate Flavocide's potential for commercial significance in the field of mosquito control**
- **Collective trials to date have demonstrated Flavocide is active against resistant populations of major mosquito species that carry diseases such as Malaria, Zika virus and Dengue fever**

Bio-Gene Technology Limited (ASX: BGT, '**Bio-Gene**' or the '**Company'**) is pleased to announce a globally significant breakthrough with trial results that confirm **Flavocide™** can control the *Anopheles gambiae* mosquito species which carries Malaria, and is increasingly resistant to commonly used insecticides.

Commenting on the results, Bio-Gene CEO Richard Jagger said: "I am delighted and proud to make this announcement today. These laboratory trial results demonstrate that Flavocide is active against resistant strains of the *Anopheles gambiae* mosquito. Combined with previous trial work, the company has now demonstrated Flavocide activity against resistant populations of the major mosquito species that carry diseases of such global importance as Malaria, Zika virus, and Dengue fever.

"Flavocide is an insecticide (a Nature Identical Molecule), that is based on a natural compound found in Australian eucalypt trees that is rapidly toxic to adult mosquitos through body contact or through tarsal (feet) contact and has reduced impact on non-target species and the environment. Flavocide is up to 5,000 times safer to bees by oral ingestion compared to other chemical products, notably the neonicotinoids, that are generally associated with bee toxicity.

"These results provide Bio-Gene with an opportunity to impact how the world manages the increasing threat of these vector borne diseases. We look forward to presenting these data to key stakeholders in the field of vector control globally, be it governments, NGO's or multinational companies, in order to collaborate with the right partners to help bring this technology to market, in an industry that is in desperate need for new technology," he said.

The studies were conducted at Purdue University, Indiana, USA which has a world-leading entomology faculty, specialising in vector control and specifically researching new technology to help control the spread of vector borne diseases. Led by Professor Catherine Hill, the trial protocol used is known as 'tarsal assay'. These tests confirmed that when mosquitoes landed on a surface treated or coated with Flavocide, the mosquitoes were killed. Tarsal assay studies help to identify compounds that may be effective for use in insecticide treated bed nets (ITN) and indoor residual sprays, the most effective and widely-used means of controlling malaria mosquitoes. At least 700 million ITNs have been distributed in Africa this millennium[2].

Professor Catherine Hill commented: "The issue of vector-borne disease is a rapidly growing global problem due to increasing insecticide resistance, population growth, urbanisation, travel, and climate change. The World Health Organisation (WHO) reports that currently more than half of the world's population is at risk from vector-borne diseases, while globally there are more than 200 million cases of malaria and over 400,000 people die from the disease every year, most of them children under the age of five. Zika virus has been declared a global health emergency, and death due to Dengue Fever has increased 30 fold in the last 50 years[3]. In 2017 the WHO reported that collectively mosquito-borne diseases such as Malaria, Dengue, Zika claim over 700,000 deaths every year. In addition, these diseases are known to exacerbate poverty and prevent economic development. Unfortunately, the effectiveness of currently used insecticides is diminishing due to resistance. The trial conducted at Purdue identified Flavocide as a potential new product for this global issue".

Bio-Gene has Material Transfer Agreements (MTA's) in place, with several corporations, many of which focus on Public Health. In September 2019, Bio-Gene announced a stored grain pest control partnership with BASF and in line with this strategy, Bio-Gene is now actively working to progress discussions to a commercial level, while also engaging with large corporates and NGO's on potential opportunities in Public Health.

Approved for release by the Bio-Gene Board of Directors.

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Investor Briefing:
Bio-Gene CEO, Richard Jagger will host a teleconference today, Thursday 12 December 2019, at 11am (Melbourne time). Telephone number: +61 2 8373 3610, Conference ID: **5282578**.

An archive of the briefing will be available afterwards at: www.bio-gene.com.au

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About Bio-Gene Technology Limited
Bio-Gene is an Australian ag-tech development company enabling the next generation of novel insecticides to address the global problems of insecticide resistance and toxicity. Its novel platform technology is based on a naturally occurring class of chemicals known as beta-triketones. Beta-triketone compounds have demonstrated insecticidal activity (e.g. kill or knock down insects) via a novel mode of action in testing performed to date. This platform may provide multiple potential new solutions for insecticide manufacturers in applications across crop protection and food storage, public health, consumer applications and animal health. The Company's aim is to develop and commercialise a broad portfolio of targeted insect control and management solutions.

Flavocide™ is a trademark of Bio-Gene Technology Limited.

About Professor Catherine Hill and Purdue University

Catherine Hill is a Professor of Entomology at Purdue University in Indiana, U.S.A. where she leads an internationally recognised research program focused on the control of insects and ticks of medical and veterinary importance. The discovery and development of new, human-safe insecticides is the primary goal of her research program. Prof. Hill and her team use bioinformatic, molecular and pharmacological approaches to identify insect-selective chemical leads with potential for development as new mode-of-action insecticides. Prof. Hill has strong interests in research entrepreneurship and commercialisation.

[1] *World Malaria Report, 2019. World Health Organisation*
[2] *Insecticide-treated nets (ITNs) in Africa 2000-2016: coverage, system efficiency and future needs for achieving international targets. Malaria Journal, 2014; 13*
[3] *https://mosquitoreviews.com/learn/disease-death-statistics*