

Additional Information: Ground-breaking MGC Pharma Research Highlights Effectiveness of Cannabinoids on Brain Cancers

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MGC Pharmaceuticals Ltd (ASX: MXC, ‘MGC Pharma’ or ‘the Company’), a European based ‘Seed to Pharmacy’ bio-pharma company focused on developing and commercialising cannabinoid derived medicines, is pleased to announce additional facts on the pre-clinical research which highlighted the positive impact of using specific cannabinoid formulations in the treatment of glioblastoma, the most aggressive and so far therapeutically resistant primary brain tumour. This research, conducted in collaboration with the National Institute of Biology (NIB) and University Medical Centre Ljubljana, is a major scientific breakthrough for the Company in successfully applying cannabinoid compounds on cancerous cells.

Key Highlights:

- Recent report on pre-clinical research focuses on the development of cannabinoid formulations specifically tailored for the effective treatment of high-grade brain tumours
- The pre-clinical research was using a glioblastoma subgroup - classified stem cells model and advanced organoid model. This model would address the effect of cannabinoids on microenvironment, which is a new type of research in this field
- Represents the first research to test the effects of a cannabinoid matrix and compounded formulations on cancerous cells using tissues taken directly from a patient, representing the company IP to develop standardised compounded medicines
- This report confirms that cannabinoid preparations can successfully inhibit tumour viability and also cause a significant fraction of glioblastoma cells to die i.e. apoptosis after a short time following their application
- Most importantly, cannabinoid formulations are shown to be able to target glioblastoma stem cells that are considered to be the “roots” of the disease and the critical target in oncology therapy
- These multi compound cannabinoid formulations (the “Small Entourage”) are more effective than single cannabinoid preparation and are the intellectual property of MGC Pharmaceuticals
- The research will proceed to a second phase of in-vitro study to relate the effects on glioblastoma subtype groups and to relate the effects of cannabinoid preparation to the four major cannabinoid receptors
- Based on the glioblastoma cells and stem cells response, the Company will start to design a clinical study in humans, to treat patients with the most effective combinations of cannabinoids **to reduce tumour volume**

Roby Zomer, Co-founder and Managing Director of MGC Pharma, commented: “This research is a major breakthrough for the treatment of tumours with cannabinoid-based compounded formulations and has wider implications on different cancer treatments. The full research report successfully shows that compounded cannabinoid formulations can have a positive effect on the treatment of glioblastoma, reducing the growth of a tumour cell and killing the cancerous stem cells, superior to single cannabinoid preparation. We are now creating a cannabinoid compound matrix which we can utilise to target a wider range of cancers and significantly advance our R&D capabilities.”

Additional Information on the Report

To initiate the study, the research, which is covered by the approval of the National Ethical Committee of Slovenia at the Ministry of Health of the Republic of Slovenia, was issued for the wider scope of INTERRREG Project TRASGLIMOMA. This is coordinated by Medical Faculty of University of Ljubljana, Prof. Radovan Komel, where NIB is the key partner, responsible for holding and managing brain tumour bank GLIOBANK. The description of the research includes processing of patients-derived tumours, cells and stem cells, for testing any biomarkers that could be targeted by bioactive molecules and that the results could be used in further translational medical research in humans.

Individualized, informed treatment of patients is an emerging trend in medicine and the work for this research included testing cannabinoids preparations in compositions that can be adjusted to individual patients. In this instance it involves the testing of fresh tumour tissues, obtained from patients after therapeutic surgical removal of the tumour, to determine the optimal cannabinoid preparation for the effective treatment of the remaining cancer - either alone or in combination with chemotherapeutic temozolomide that is used in the patients with certain epigenetic set-up.

A key highlight of the research included the cannabinoid formulations synergistic effects on glioblastoma stem cells, better than single cannabinoid preparation.

Following this study, pre-clinical studies will continue in-vitro to find the most efficient cannabinoid preparation by using a four-dimensional matrix that will be constructed to correlate these parameters. This will define the selected cannabinoids' preparations/combinations as the most efficient to inhibit viability of patients-derived glioblastoma cell and/or their stem cell and will allow the company to create a cannabinoids compounded formula. Subsequently this will allow us to move to Clinical Study Phase II/III. Based on the platform that this pilot study is setting up, the clinical laboratories could be entitled to determine the optimum cannabinoids compounding preparations to be administered to individual patients during (postoperative) adjuvant therapy in vivo, in a random trial clinical (RTC) study. Once we have the patient derived glioblastoma cells and stem cells response, we can suggest to the oncologist to treat patients with the most effective combinations of cannabinoids mixture to reduce tumour volume.

To assist with medical agency approval to use the formulations for human studies, a study can be completed as follows, based on the matrix of patient tumour response in-vitro to particular formulations/dose and cannabinoid receptors, we could directly transplant the patients-derived tumour cells (xenograft) into animal brain and after the tumour growth in vivo, apply cannabis formulations alone, and in the combination with standard therapy for glioblastoma: chemotherapeutic temozolomide and irradiation or both.

The end point to measure the therapy effects is:

1. Tumour volume (MRI)
2. Survival rate

The NIB research team completed an independent assessment of these results. **To view a copy of the report please [click here](#).**

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About MGC Pharma

MGC Pharmaceuticals Ltd (ASX: MXC, OTCQB: MGCLF) is an EU-based BioPharma company with many years of technical clinical and commercial experience in the medical cannabis industry. The Company's founders were key figures in the global medical cannabis industry and the core business strategy is to develop and supply high quality cannabinoids-based pharmaceuticals products for the growing demand in the medical markets in Europe, North America and Australasia.

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About National Institute of Biology (NIB)

National Institute of Biology (NIB) is the largest independent Public Research Institution for Life Sciences in Slovenia. The Institute was established by the Government of the Republic of Slovenia in 1960. The basic activity of the Institute has been and continues to be basic, developmental and applicative research in the fields of biotechnology, biophysics, biomedicine and system biology. NIB works in close cooperation with affiliated higher education and research institutions in Slovenia and abroad. This synergy ensures that the knowledge produced at the Institute is widely accessible to the society through education and outreach activities and is beneficial to the economy by being transferred into practice.