

Project Title Implanted device development for targeted in-tumour delivery of chemotherapeutics

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Project Description Targeted delivery of chemotherapy via implanted devices is a promising method to improve therapeutic effect when fighting non-resectable glioblastoma multiforme tumours. Technologies such as convection enhanced delivery have limitations in the chemotherapeutic doses achievable due to the injection of liquid drug cocktails at high pressures into the tumour which can cause further brain injury. New delivery technologies which rely on non-liquid ionic transfer have the potential to enable the delivery of larger therapeutic doses due to the transfer not causing a volume increase. This mechanism of drug delivery relies on the movement of molecules through a conductive elastomer (CE) matrix, which has the potential to alter the efficacy of the released drug.

This goal of this project is to investigate the effect of this release mechanism on common chemotherapeutic drugs (doxorubicin and cisplatin), and to identify other potential drug candidates. Drug loaded CE-based devices will be fabricated and used in conjunction with in vitro glioblastoma cell cultures. The therapeutic effect will be quantified using apoptotic and metabolic assays. The impact of the release mechanism on the drug stability will be assessed using molecular models of the chemotherapeutic agents within the CE matrix and cross validated with the in vitro experimental data.