

WLCOW ENGINEERING AWARD 2024

Dr Nicholas Bennion



Nick is a Lecturer at Cardiff University. His project involves the development of advanced Convection Enhanced Delivery (CED) devices to deliver chemotherapy to brain tumours.

Convection Enhanced Delivery (CED) represents a cutting-edge neurosurgical technique for directly administering therapeutic agents into the brain. This method is crucial for treating brain cancers and neurodegenerative disorders, as it effectively circumvents the blood-brain barrier, enabling precise targeting of specific brain areas. Current therapeutic agents show promising cellular-level results. However, the surgical devices used in CED are not yet optimised, leading to suboptimal outcomes and side effects, thereby limiting their effectiveness in clinical trials.

Evaluating new devices for CED involves two primary methods: experimental and computational. While experimental setups provide tangible representations of device performance, they are costly. On the other hand, computational models, though challenging to develop, offer rapid, economical solutions when executed correctly. The ideal strategy integrates experimental data into developing these computational models.

With the necessary equipment, they will can refine experimental methods, laying a solid foundation for the devices' development. This project necessitates long-term, collaborative research into the mechanics of the infusion process, leveraging expertise from the Schools of Engineering and Medicine.

Having achieved a lecturing position relatively early in his career, he is committed to leading this pioneering research group in Wales. He has secured a dedicated lab space at the University and now seeks funding to acquire the essential experimental equipment. This will enable the demonstration of experimental advancements and sharing these breakthroughs within the engineering and clinical communities.