

Metamaterial coupled Wireless Optogenetics system to treat neurological disorders

Electrical or focal brain stimulation based on implantable devices remains a therapeutic strategy of interest for people with medication-resistant forms of brain diseases such as epilepsy and who are not candidates for surgery. However, uncontrolled electrical stimulation of undesired neurons introduces shortness of breath, cough, throat pain, thereby restricting the extent of this approach. Recently, Optogenetics provides controlled stimulation in genetically modified neurons to allow optical stimulation (470 nm blue light) or inhibition (580 nm yellow light). Nevertheless, scientists pursuing optogenetics treatments for brain diseases still face some technical challenges, for example, traditional optogenetics methods for powering the neural implants relies on stiff and tethered (e.g. optical fibres) systems.

The objective of this research is to explore and develop a metamaterial-based wirelessly powered system for optogenetics.

Please contact Dr Rupam Das or Prof David Wright via metamaterials@exeter.ac.uk for more information.

References

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