

Licensing Opportunity



Novel insight into drug action in the central nervous system using pharmacological MRI

- A new and non invasive method critical to the business of drug discovery and development (e.g., brain penetration, biodistribution, dose-response and pharmacokinetics).

CNS | Drug safety and efficacy measurement

2011

Background

While PET and SPECT techniques provide targeted imaging of specific molecules, the usage of radioisotopes limits extensive use in vulnerable human subjects (e.g. paediatric population) and compared to MRI methods, spatial resolution is poor. A new non invasive imaging technique is pharmacological MRI (phMRI). phMRI differs from functional (f)MRI in that the neuronal system is not activated by a motor or cognitive task, but pharmacologically. phMRI has great potential for better understanding the effects of neuropharmacological manipulations on the functional connectivity of brain structures. Unlike PET and SPECT, phMRI does not offer the sensitivity to markers of specific pharmacological action, but can, however, provide in vivo markers of the neuropharmacological modulation of neuronal activity across the whole brain with unparalleled spatial and temporal resolution. Despite the tremendous impact in animal experimental literature, hardly any translation has been made so far to study these systems non invasively in the living human brain. We have developed a new acquisition technique and analysis method for phMRI in the living human brain, to assess DA-, and 5-HT imbalances non invasively in several important paediatric neuropsychiatric disorders.

Applications

In vivo marker of neuropharmacological modulation across the whole brain with unparalleled spatial and temporal resolution.

New insights of drug action into neurotransmitter systems in vivo, non invasively.

Readily and widely available on clinical scanners with minor adaptations.

Improve strategies and rationale for the selection of novel drugs for further preclinical or clinical development.

Researchers

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Key publications

1. Klomp A, Tremoleda JL, Wylezinska M, Nederveen AJ, Feenstra M, Gsell W, Reneman L. Lasting effects of chronic fluoxetine treatment on the late developing rat brain: Age-dependent changes in the serotonergic neurotransmitter system assessed by pharmacological MRI. *Neuroimage*. 2012 Jan 2;59(1):218-26. Epub 2011 Aug 4.