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Measuring Endogenous 5-HT Release with PET

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(lunch at 12, talk at 12:15) 310 Cedar St



Abstract Molecular *in vivo* neuroimaging techniques can be used to measure regional changes in endogenous neurotransmitters, evoked by challenges that alter synaptic neurotransmitter concentration. This technique has most successfully been applied to the study of endogenous dopamine release using positron emission tomography, but has not yet been adequately extended to other neurotransmitter systems. This talk focuses on how the technique has been applied to the study of the 5-hydroxytryptamine (5-HT) system. The principles behind visualising fluctuations in neurotransmitters are introduced, with reference to the dopaminergic system. Studies that aim to image acute, endogenous 5-HT release or depletion at 5-HT receptor targets are summarised, with particular attention to studies in humans. Radiotracers targeting the 5-HT_{1A}, 5-HT_{1B}, 5-HT_{2A}, and 5-HT₄ receptors and the serotonin reuptake transporter have been explored for their sensitivity to 5-HT fluctuations, but with mixed outcomes; tracers for these targets have not reliably proven suitable for imaging endogenous 5-HT in humans. I will discuss how the selection of targets, radiotracers, challenge paradigms, and experimental design might be optimised to improve our chances of successfully imaging endogenous neurotransmitters in the future.

