Awake Animal Imaging with microPET and Motion Tracking System
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Positron Emission Tomography (PET) is typically used for tumor detection and staging in clinic, as well as in research settings. Small animal PET (microPET) has become an invaluable platform for research in molecular biology, physiology, disease, cognition, pain, and drug response in living animals. Small animals undergoing microPET imaging must be anaesthetized to prevent motion that would deteriorate the images seriously and restrict quantitative analysis. However, there is myriad evidence that anesthesia affects many physiological parameters, including glucose metabolism, radioligand binding, cerebral metabolic rate, and neurotransmitter flux. A better understanding of the mechanism and nature of anesthetic effects on measurements of neurofunctional parameters and how they impact microPET is critical for the interpretation of past and future preclinical studies.

Within the scope of this study, we will investigate these questions using a unique awake animal imaging technology to enable microPET studies of brain function to be performed on awake rodents (Kyme et al. 2011). During the acquisition of PET data, an optical motion tracking system will capture the pose of a marker attached to the rats head. Then the correction will be applied to each line of response by using the information obtained by the tracker.

\textbf{Figure 1.} Image of a continuously moving micro Deluxe phantom during the acquisition. Left: Before motion correction; Right: After motion correction.

\textbf{References}