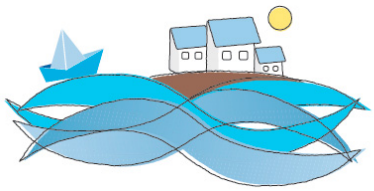

Mediterranean Thematic Workshops in Advanced Molecular Imaging

Contribution ID: **4** Type: **Invited Virtual**

Tradeoffs between Full Kinetic Modeling and Simplified Approaches in Neuropsychiatric PET

Monday 5 September 2022 12:10 (30 minutes)

PET imaging allows the production of high resolution images of radiopharmaceutical distribution in humans and animals. With the use of appropriate radiopharmaceuticals combined with tracer kinetic modeling, relevant physiological parameters such as volume of distribution (VT) and binding potential (BPND) can be quantified in vivo. The development of appropriate modeling methodology typically requires dynamic scans plus arterial input function measurement including assays of radiolabeled metabolites. Ideally, additional validation studies are also performed, including in vivo blocking studies and in vivo/ex vivo/in vitro correlations. Ultimately, to facilitate clinical utility, simplified methodology is developed, e.g., calculating standard uptake values (SUV) and their ratios (SUVR) to an appropriate (or useful) reference region. That process produces a clinically feasible approach but may suffer from increased variability or biased values which can differ in various patient populations or in different patient states. This presentation will include 1) basic PET quantification strategies for brain targets, 2) tracer validation and optimization, using as an example 11C-UCB-J, the novel SV2A agent used to assess synaptic density, 3) characterizing and optimizing a simplified quantification method using SUV and SUVR, including the inherent assumptions of these approaches, 4) examples of imaging paradigms where simplified approaches can provide misleading results, and 5) methods to improve simplified approaches without extending acquisition times to account for effects of plasma clearance of radiopharmaceutical.

Topic Selection

Presenter: CARSON, Richard (Yale University)

Session Classification: Tracers and other modalities

Track Classification: Tracers and other modalities