OIM2 SYMPOSIUM
Talk Abstract Submission

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Talk Title *

From radioactive materials to in vivo models: the role of molecular imaging in preclinical research

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ABSTRACT

Maximum 300 words, you can add figures to your abstract.

The preclinical evaluation of novel radioactive materials, radiopharmaceuticals, nanomaterials, and other biomedical compounds requires methodologies capable of characterizing their in vivo behavior and biological efficacy. Molecular imaging provides a powerful non-invasive approach for visualizing and quantifying biodistribution, targeting, pharmacokinetics, therapeutic response, and disease progression in animal models.

BIOEMTECH develops advanced preclinical imaging technologies with a particular focus on real-time in vivo imaging of radiolabelled compounds in small animals. By enabling dynamic visualization from the first seconds following administration, these systems provide rapid information on early biodistribution, clearance pathways, administration routes, and optimal time points for subsequent tomographic imaging using SPECT or PET. Longitudinal imaging further enables the same animal to be monitored over time, supporting quantitative assessment of treatment response and more efficient experimental designs.

Beyond conventional radiopharmaceutical development, radiolabelling and molecular imaging can also be applied to nanomaterials and nanoparticles. In addition to revealing their in vivo fate and tissue accumulation, imaging can be utilised to evaluate their efficacy in different disease models and to relate material properties and formulation to biological performance.

Representative preclinical studies in small-animal models will be presented, including examples from radiopharmaceutical research, targeted radionuclide therapy, and the in vivo evaluation of nanomaterials across different disease models. These studies illustrate how molecular imaging can bridge material development, biological evaluation, and therapeutic assessment, providing preclinical evidence to support the development of emerging biomedical technologies toward clinical applications.

Keywords *

Preclinical studies, molecular imaging, radiopharmaceuticals, nanomaterials

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