

## Novel apoptosis marker

A novel tracer, <sup>18</sup>F-ICMT-11, targeting specific biological processes to improve detection of tumours that are often missed by FDG PET imaging.

### Proposed use

<sup>18</sup>F-ICMT-11 PET imaging can sensitively detect apoptosis, a marker for efficacy in chemotherapy.

### Problem addressed

Routine clinical use of PET is based on FDG, a glucose analogue. FDG measures viable cell metabolism. However it lacks specificity and FDG imaging often misses less glycolytic/aggressive tumours. Accordingly, there is a need for tracers targeting specific biological processes and molecular pathways.

Effective anticancer therapy induces tumour cell death through apoptosis. Non-invasive monitoring of apoptosis during therapy may provide predictive outcome information and help tailor treatment. Since a majority of oncology therapies induce apoptosis it could be used as an early and specific signal of therapeutic efficacy.

### Technology overview

A team at Imperial College London, led by Eric Aboagye, has developed a novel strategy for the detection of treatment efficacy with <sup>18</sup>F-ICMT-11 PET in preclinical models of non-small cell lung carcinoma

The team demonstrated <sup>18</sup>F-ICMT-11 is a sensitive marker of chemotherapy-induced cell death in preclinical models of lymphoma, breast and colon cancer. They also showed that apoptotic, but not necrotic response of NSCLC to platinum-based therapy is detectable by <sup>18</sup>F-ICMT-11, through sub-nanomolar binding to caspase-3.

<sup>18</sup>F-ICMT-11 PET has been demonstrated to be safe in human patients with a dosimetry profile comparable to other <sup>18</sup>F PET tracers.

These results establish <sup>18</sup>F-ICMT-11 as a good pharmacodynamic marker of apoptosis and biomarker of efficacy even in the absence of tumour shrinkage.

### Benefits

- Sensitive marker of chemotherapy-induced cell death
- Safe and well-tolerated in humans
- Discriminates between apoptosis and necrotic response to platinum-based chemotherapy

Jon Wilkinson

Senior Executive, Medicine

Industry Partnerships and  
Commercialisation - Medicine

**e:** [Jonathan.Wilkinson@imperial.ac.uk](mailto:Jonathan.Wilkinson@imperial.ac.uk)

**t:** +44 (0)20 7594 6592

**Technology reference:** 4227

### Intellectual property information

The technology is protected by a granted patents in the EU and US  
WO2010026388A1

### Link to published paper(s)

<https://pubs.acs.org/doi/10.1021/jm801107u>

<https://inm.snmjournals.org/content/54/9/1551.long>

<https://www.pnas.org/content/106/38/16375>

<https://clincancerres.aacrjournals.org/content/19/14/3914>

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0091694>

<https://link.springer.com/article/10.1007/s00259-018-4098-9>

### Inventor information

Professor Eric Aboagye – Professor of Cancer Pharmacology and Molecular Imaging, Director of the CRUK-  
EPSRC-MRC-NIHR Comprehensive Cancer Imaging Centre