

CRC BID Sharpens Focus of Brain Cancer Imaging

Partners Sought for FET Multi-Centre Trials

The Cooperative Research Centre for Biomedical Imaging Development (CRCBID) has put out a call for partners in multi-centre trials investigating the efficacy of fluoro ethyl tyrosine (FET) as a tracer for positron emission tomography (PET) scanning.

The announcement of the multi-site trial follows promising results from a pilot study of FET, which has indicated that the tracer offers significant benefits when used to diagnose patients with brain tumours.

During the study, conducted at the Peter MacCallum Cancer Centre (Peter Mac), FET PET provided the correct information for treatment planning in 96% of cases, compared with 52% for standard PET scans using fluoro deoxy glucose (FDG).

“These results, obtained during collaborative research supported by CRCBID, agree closely with the results of other international research institutions, paving the way for us to move into the next phase in the FET research pathway,” explains Professor Rod Hicks, CRCBID’s Radiopharmaceutical Stream Leader.

“Together with the rapid evolution of FET PET we expect as a result of work now underway by our research partners, this means we can now seek to engage with PET centres around the country in order to gather additional data,” he says.

As part of the preparation for the multi-centre trial, CRCBID research partners ANSTO and Peter Mac are working with manufacturer Cyclotek (Aust) Pty Ltd, to refine synthesis protocols for FET, enabling more efficient and cost-effective production, and to establish good manufacturing practice (GMP) production of FET for clinical use.

“These innovations make it feasible to supply the tracer to PET facilities around Australia,” Professor Hicks reports, “while new research protocols are also being finalised to

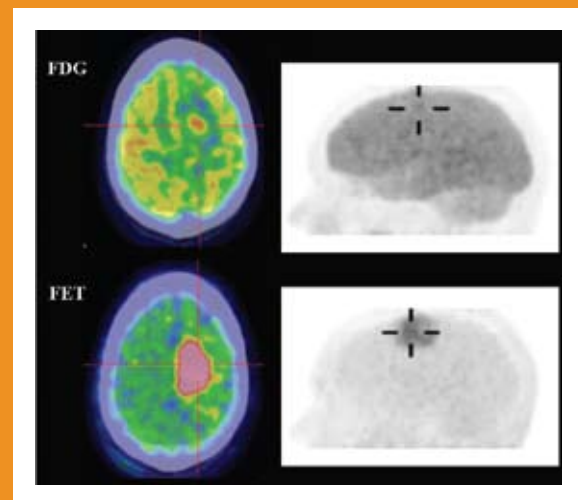
allow the clinical utility of PET scanning to be validated in larger groups of patients.”

PET facilities interested in participating in the FET multi-site trial should contact Dr Gerard Roe at CRCBID on 03 9467 6277 or e-mail gerry.roe@crcbid.com.au.

FET/FDG Comparison – Preliminary Data

Preliminary Peter MacCallum Cancer Centre data on 21 brain tumour patients with FDG & FET PET

- **FDG sensitivity 27%, specificity 90%, accuracy 52%**
- **FET sensitivity 93%, specificity 100%, accuracy 96%.**



FET allows improved planning for brain tumour treatment

Brain tumours are not only one of the most common forms of cancer, they can be among the most debilitating. Now, a new radiotracer developed by CRCBID, fluoro ethyl tyrosine (FET), is showing great promise for helping to improve treatment planning for patients with these insidious tumours.

Brain tumours are notoriously difficult to treat, as both the tumor itself and the treatment of the cancer, can damage normal brain tissue. Sometimes, this can cause major disability – and even with the best treatment options available, patients with high-grade tumours are unlikely to survive more than two years.

It is not surprising, then, that a great many resources are devoted to improving existing treatments, like surgery, radiotherapy and chemotherapy, and to developing new therapies such as those which more specifically target the genetic and metabolic abnormalities which cause these tumours.

All these treatment options, however, can be impaired because of an inability to define the extent of the tumour and accurately monitor its response to treatment. Pilot studies by CRCBID into FET indicate that it has the potential to overcome these limitations.

The results of these studies indicate that FET can not only give a clearer picture of the tumour, but also allow treating physicians to determine early in the treatment cycle whether the therapy is having the desired effect.

“PET scanning has revolutionised cancer management since its introduction in the mid 1990s,” explains Professor Hicks, “because unlike CT and MRI scans, which show the body’s structure, PET scanning makes the body’s metabolic activity visible, providing diagnostic information that can’t be obtained as easily – or at all – using other techniques.

“While contrast enhanced MRI is still the major method for planning and monitoring brain tumour therapy, it does have limitations – for instance, it is sometimes difficult to tell the difference between abnormalities caused by scar tissue or the effects of radiation, from those caused by tumour recurrence,” says Professor Hicks.

“Metabolic imaging with PET often provides a better guide for treatment for patients, yet conventional PET scanning using fluoro deoxy glucose (FDG) also has limitations as it identifies abnormal uptake of glucose, which not only varies according to the aggressiveness of the tumour, but is also the preferred fuel of normal brain cells which, therefore, also have a high uptake of FDG.”

FET, on the other hand, is another type of metabolic probe altogether, using radio-labelled amino acids, long known to be able to accurately determine the location of active brain tumour cells due to their need for much larger amounts of amino acids to support their disordered growth.

Until now, the clinical application of these tracers has been limited as they have been radio-labelled with the Carbon-11 isotope (¹¹Carbon) which has a half-life of only 20 minutes, making it impractical for transport or multi-site trials.

By replacing the ¹¹Carbon with ¹⁸Fluorine, an isotope with a much longer half-life, CRCBID has overcome this limitation.

“Now, with collaborative research leading to production methods with sufficient yield to enable wide distribution, CRCBID has an exciting new product which promises to offer important options to those involved in the treatment of brain tumours,” reports Professor Hicks.

CRCBID aims to develop and commercialise new radiotracers for clinical use to pinpoint disease to ultimately improve treatment and patient care. The CRC is founded on a collaborative arrangement between research and industry participants, established and supported under the Australian Government’s Cooperative Research Centres Programme. The participants include the Australian Nuclear Science and Technology Organisation, The Peter MacCallum Cancer Centre, The Garvan Institute of Medical Research, Monash University, Cyclotek, GE Healthcare and Berthold.



Cooperative Research Centres



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CRC for Biomedical Imaging Development Ltd
ABN 33 115 962 386

40 Clements Avenue, Bundoora VIC 3083 Australia
Tel 03 9467 6277 Fax 03 9467 7493 www.crcbid.com.au