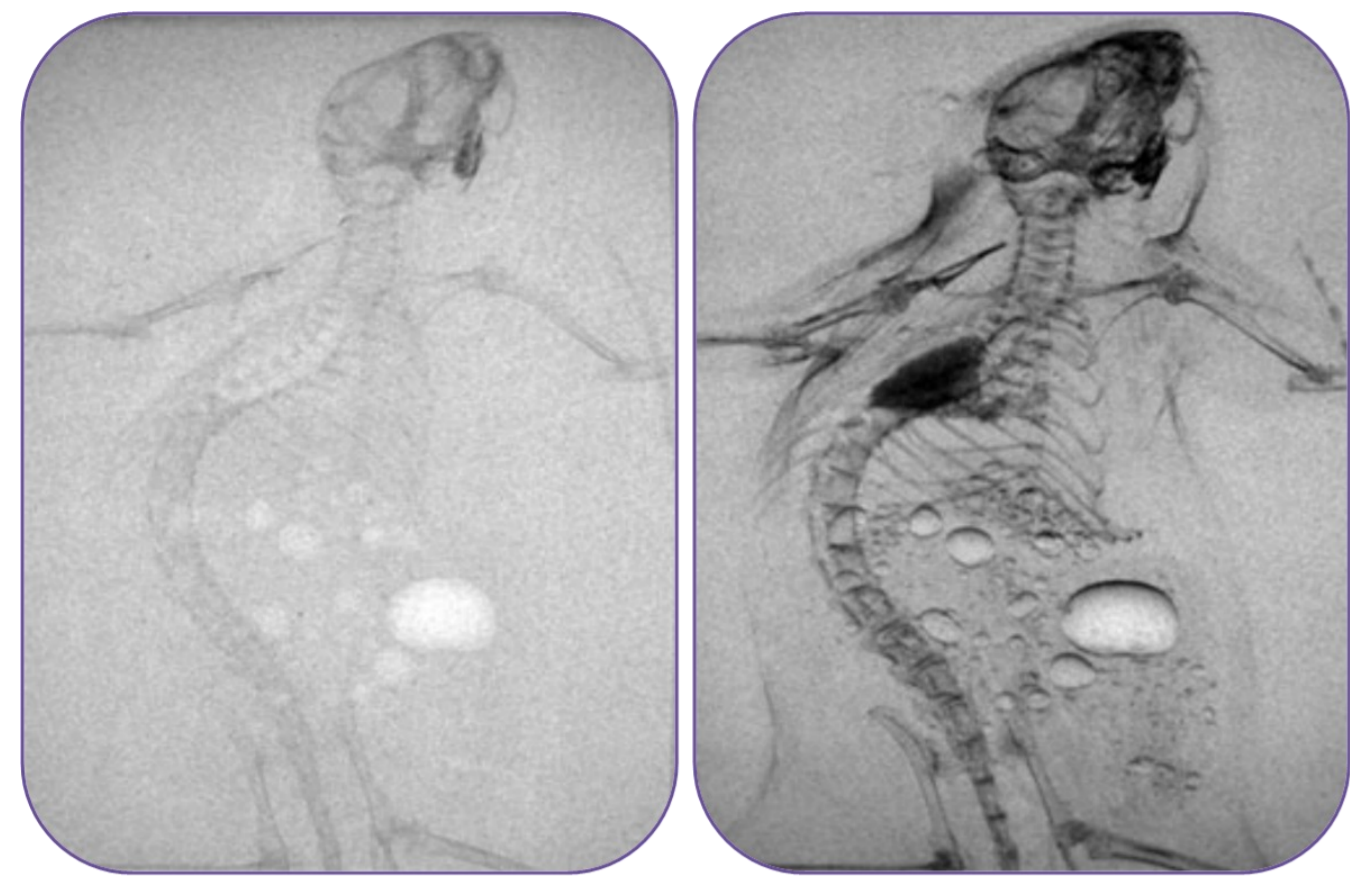


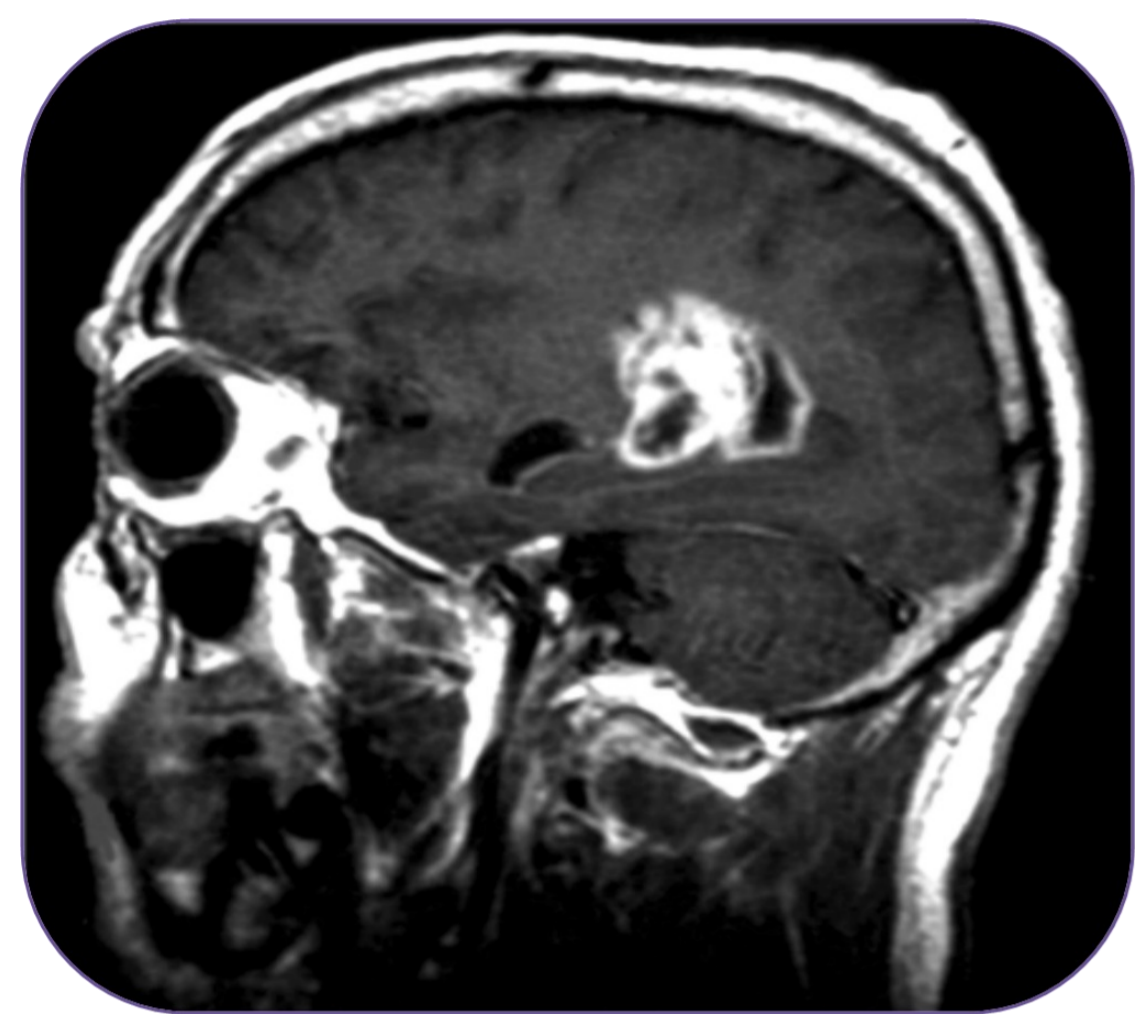
# The Fight Against Cancer



## Seeing Tumours

Synchrotron light allows researchers to see the shape and size of tumours more clearly than with conventional methods. The synchrotron image (right) reveals soft tissues such as the lungs (the dark triangular shape) and muscles that are obscured in the conventional X-ray radiograph (left). 🌸

[www.lightsource.ca/media/media\\_release\\_20081223.php](http://www.lightsource.ca/media/media_release_20081223.php)



## Combating Brain Cancer

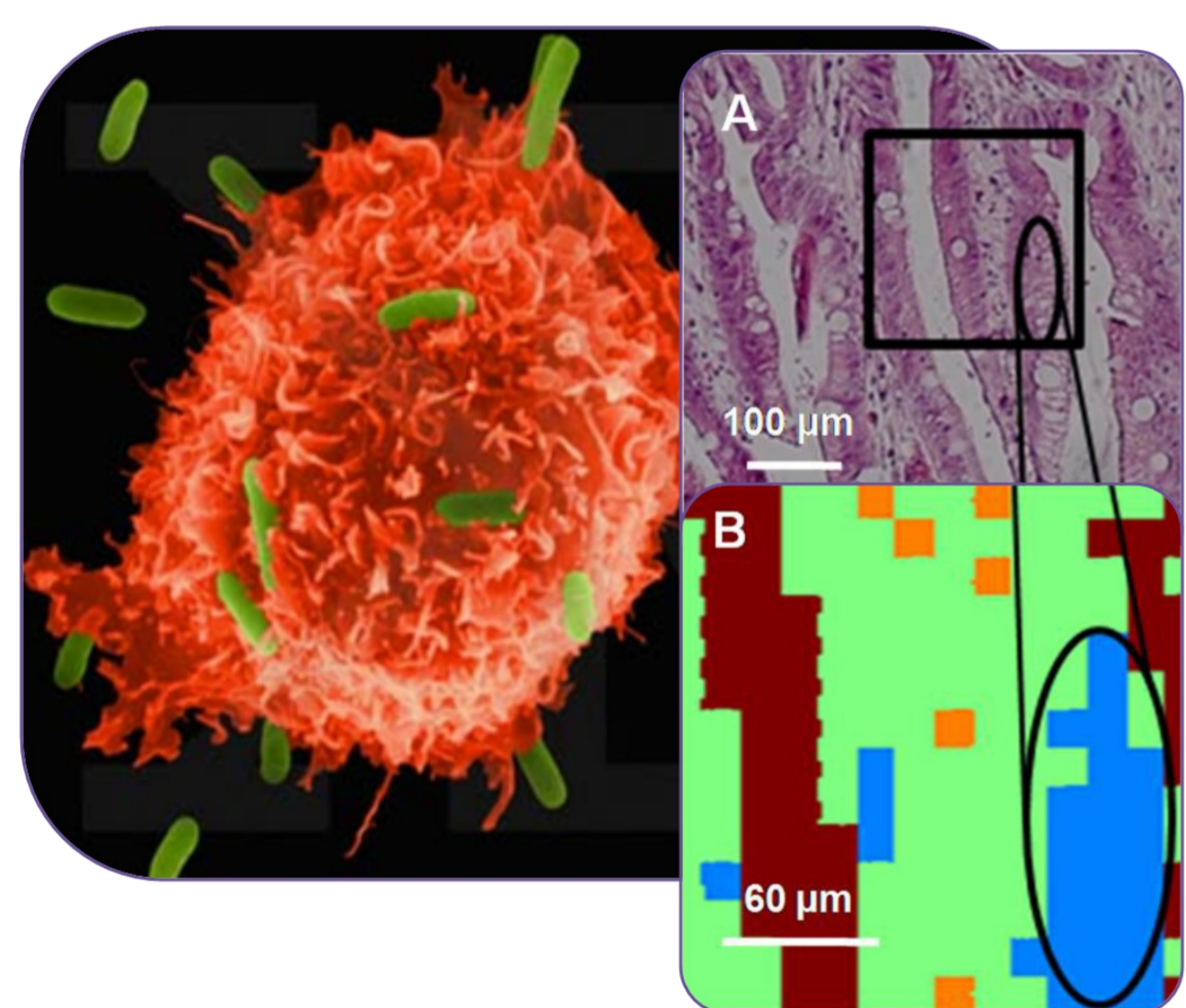
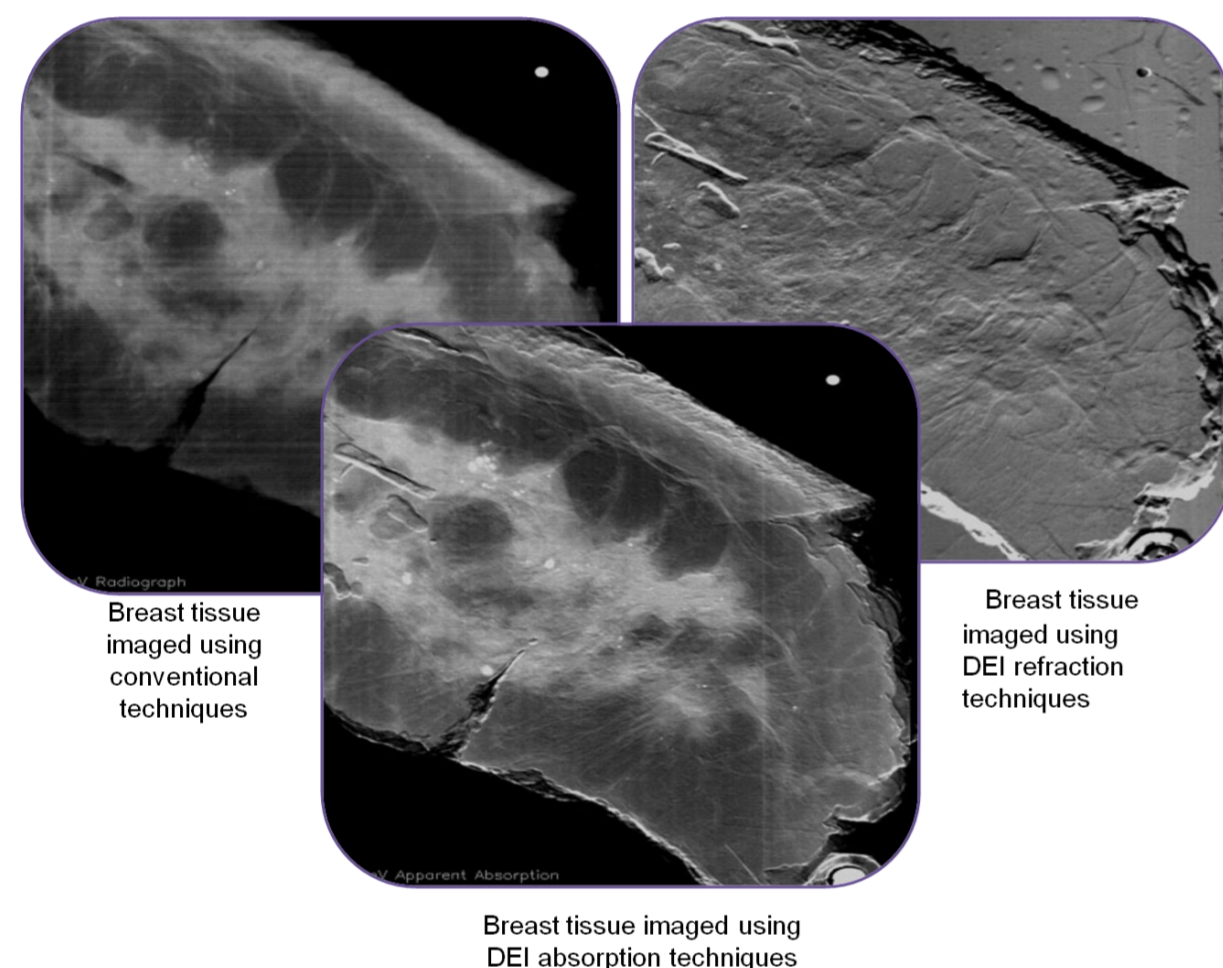
Limitations in the ability to detect cancer cells from the perimeter of a surgically removed tumour is a major obstacle in fighting malignant brain tumors. Using the CLS, identification of tumour tissue at the sub-cellular level has been further refined. The molecular signatures of tumour tissue were compared against healthy brain tissue in order to determine differences between the two samples. This will aid in early identification and complete removal of malignant brain tumours. 🌸

[www.ncbi.nlm.nih.gov/pubmed/20514416](http://www.ncbi.nlm.nih.gov/pubmed/20514416)

## Shining Light on Breast Cancer

The ability of synchrotron light to image soft tissues is leading to earlier and more precise breast cancer diagnosis. Diffraction Enhanced and Phase Contrast X-ray imaging can image breast tumours with more detail than conventional mammography, while delivering smaller radiation doses to the patient. Clinical trials are already taking place in Italy to help distinguish actual tumours from 'false positives' in women. 🇨🇦

[www.lightsource.ca/files/details.php?id=797](http://www.lightsource.ca/files/details.php?id=797)



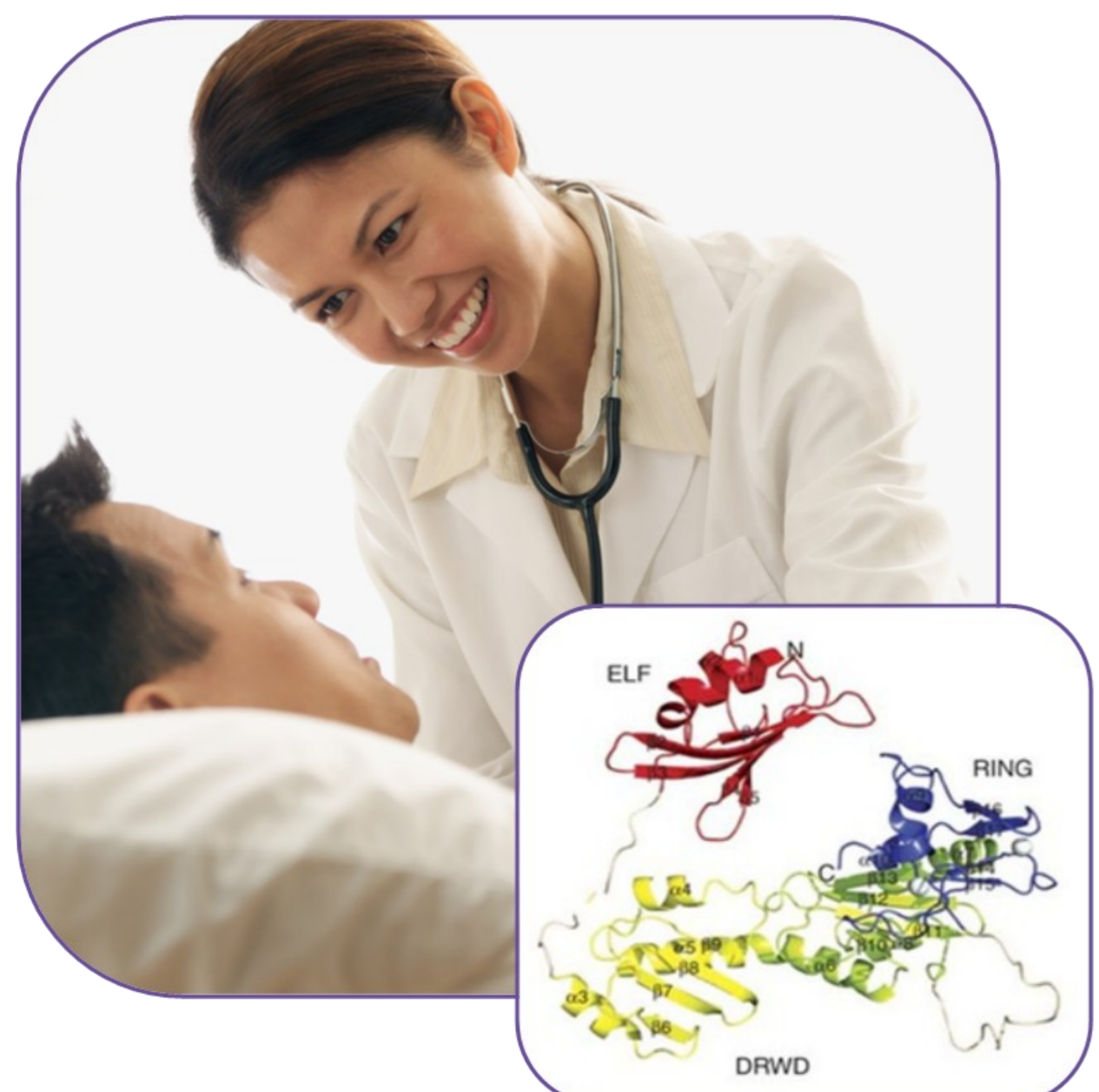
## Fingerprinting Cancer Cells

Scientists are using mid-infrared spectromicroscopy to identify the specific chemical signatures that distinguish tumour tissue from normal tissue. An examination of meningiomas – a group of unpredictable brain tumours with high risk of recurrence – was undertaken by researchers at the CLS. This technology is also being used to study a condition known as Barrett's Esophagus (BE), which can lead to an aggressive form of esophageal cancer. By looking at chemical signatures in esophageal tissues the CLS researchers are hoping to develop methods that will assist in early diagnosis of this type of cancer. 🌸

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## More Effective Chemotherapy

Cancer is characterized by the body's cells dividing rapidly out of control. One group of chemotherapy drugs work by targeting the genetic material inside cancer cells, thereby stopping the cell from reproducing. However, cancer cells have the ability to repair this DNA damage, which reverses the effects of this chemotherapy. Scientists from Cancer Research UK have been using a synchrotron to study the crystal structure of FANCL- a protein known to play a role in initiating the DNA repair process. By understanding how this protein functions, chemotherapy treatments have the potential to block this repair system and become much more effective. (Diamond)



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