

## *In vitro* imaging

*In vitro* imaging is a suite of techniques that utilises radiolabelled, biological or chemical probes to determine the distribution and concentration of biomarkers within a biological sample.

These methods can be used stand alone or in combination with *in vivo* imaging technologies as they provide a complementary data set. Whilst PET and SPECT imaging provides a dynamic view of a biological system, *in vitro* imaging provides a snapshot of the same system at a high resolution and at greater sensitivities. *In vitro* imaging can be used with a large set of radio-probes. Often multiple probes may be used, testing different parameters on the same tissue.

The phosphor plates used for *in vitro* autoradiography are comprised of a BaEuBr crystal matrix that can absorb ionising radiation and store it as a latent image. This latent image can be visualised by scanning in phosphorimager with a red laser in a process known as phosphor stimulated luminescence. The phosphor plates have a spatial resolution of approximately 100µm and have sensitivities in the low Bq range (depending on the isotopes).

The platform has standardised protocols for standard imaging radioisotopes as well as a range other alpha, beta and gamma emitting isotopes. For detection of tritium or tritium labelled compounds we employ film autoradiography.

These techniques have been applied in determining the fate and the organ bioaccumulation of heavy metal ions in marine organisms and aquatic ecosystems.

### Capability Selections

- Receptor autoradiography to determine the localisation and quantification of radioligand receptor binding sites
- Receptor binding assay to reveal distribution and functional activation of G-protein coupled receptors in mammalian tissue
- Histological and immunochemical staining determine localisation of biomarkers.

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