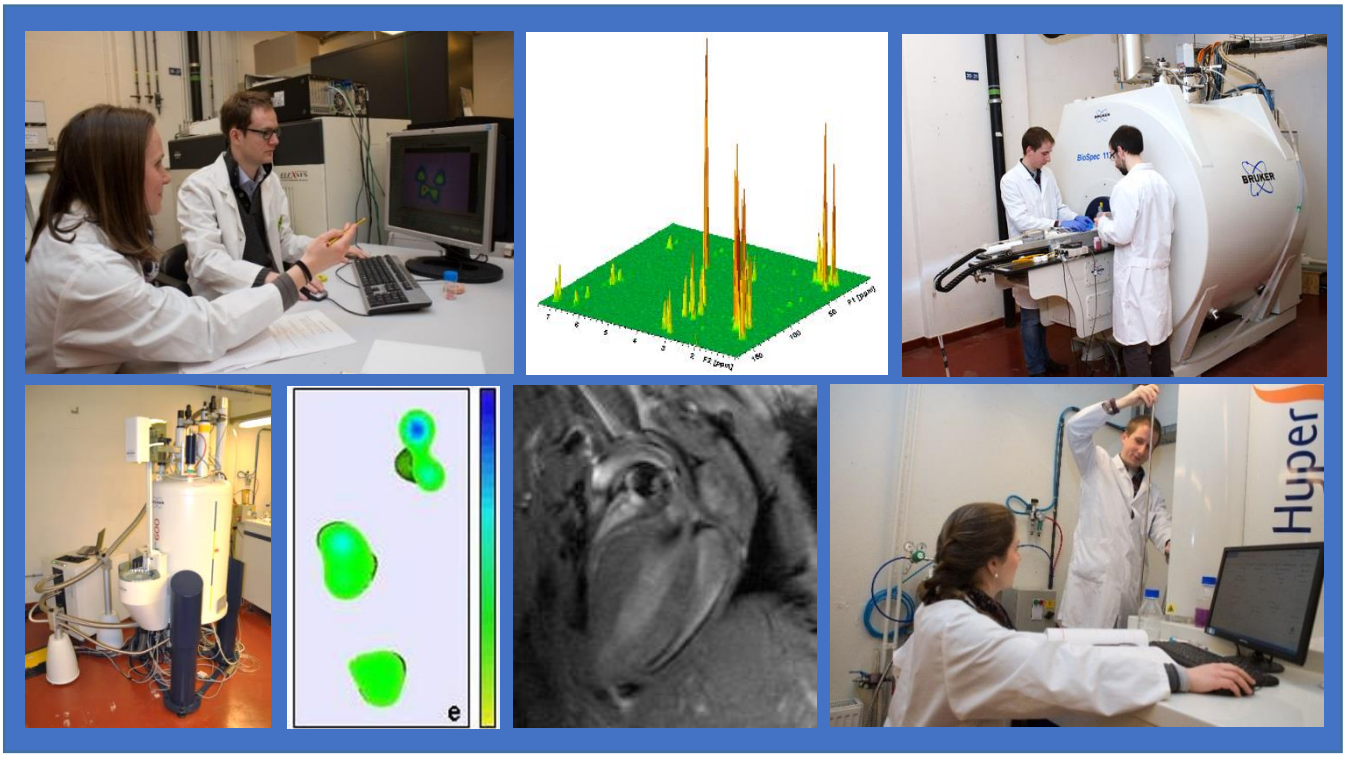
The preclinical Nuclear and Electron Spin Technologies (NEST) platform accommodates cutting-edge magnetic resonance technologies dedicated to studies on biological samples and small animals.
These technologies may provide convenient biomarkers for monitoring parameters involved in several pathologies.



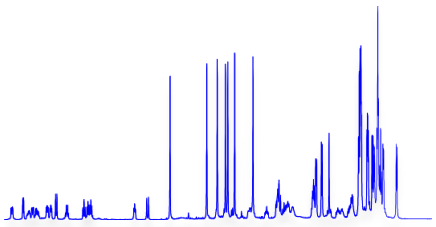
LOUVAIN DRUG RESEARCH INSTITUTE

UCLouvain

https://uclouvain.be/en/research-institutes/ldri/nest

NUCLEAR MAGNETIC RESONANCE

- Metabolomics study on biological samples (plasma, urine, etc.)
- Saturation transfer difference
- 2D homonuclear and heteronuclear correlation (such as J-RES, COSY, TOCSY, etc.)
- HRMAS experiment on biopsies



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MAGNETIC RESONANCE IMAGING

- In vivo anatomical structures with high spatial resolution
- Metabolism (spectroscopy and spectroscopic imaging)
- Cardiac and vascular imaging
- Tissue perfusion (by Dynamic Contrast Enhanced MRI, DCE-MRI)
- Diffusion measurement
- Cell tracking

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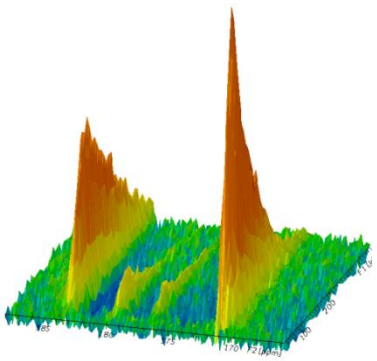
DYNAMIC NUCLEAR POLARIZATION

- Study of metabolic fluxes using ^{13}C-MRS as biomarker of response to anti-cancer treatment (*in-vitro* and *in-vivo*)
- Use of ^{13}C pyruvate and its metabolites (lactate and alanine) as biomarker of tumor metabolism and glycolysis
- Use of ^{13}C glutamine and its conversion into glutamate to study tumor metabolic shifts in response to treatments *in-vitro*
- Use of hyperpolarized substrates for the stratification of tumors



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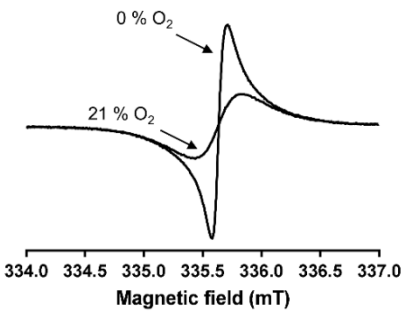

ELECTRON PARAMAGNETIC RESONANCE

- Free radicals characterization, redox status
- Quantification of melanin / melanoma cells in tissues
- Dosimetry (retrospective dosimetry in bones and teeth)
- Dosimetry in phantoms (external beams, brachytherapy)
- Tissue oxygenation, oxygen consumption (cells and mitochondria)
- MRI contrast agent quantification (e.g. iron oxides)

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Many other expertise and on-site facilities

- Cell culture
- Molecular biology equipment
- Animal facility
- …

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