



**University of  
Nottingham**

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## Precision Imaging Beacon of Excellence Studentship Form

|                    |  |                 |         |
|--------------------|--|-----------------|---------|
| <b>Supervisors</b> | <b>Professor Thomas Meersmann</b><br><b>Dr Galina Pavlovskaya</b><br>Sir Peter Mansfield Centre, School of Medicine<br><b>Dr Paul Glover</b><br>School of Physics  |                 |         |
| <b>Start date</b>  | September 2018   | <b>Duration</b> | 3 years |
| <b>Project</b>     | <b>Development of hyperpolarized <math>^{83}\text{Kr}</math> whole body MRI at SPMIC's 7T facility</b>   |                 |         |
| <b>Abstract</b>    | <p>Hyperpolarized (HP) noble gases enable pulmonary MRI contrast to probe different structural and functional aspects of lungs in health and disease. New strategies with these benign (non-radioactive) markers are explored to enable molecular MRI – i.e. the imaging of the distribution of certain biomarker molecules in the body using specially designed biosensor molecules that interact with HP noble gases. A completely novel HP contrast agent, pioneered at the Sir Peter Mansfield Imaging Centre (SPMIC), uses the noble gas isotope <math>^{83}\text{Kr}</math> that enables new MRI modalities due to high nuclear spin <math>I = 9/2</math>. HP <math>^{83}\text{Kr}</math> MRI protocols utilizing Surface quadrupolar relaxation (SQUARE) have been developed to provide a completely new class of MRI contrast. Unlike many other surface analytical techniques, HP <math>^{83}\text{Kr}</math> SQUARE MRI contrast can be obtained at ambient atmospheric conditions and thus can serve as a biomarker for pulmonary diseases that affect the lung surface.</p> <p>Nottingham's unique expertise and capability in HP <math>^{83}\text{Kr}</math> technology and the very high field facility with the 7T whole body Scanner at SPMIC provide a unique environment to advance these exciting new MRI contrast agents towards human subject applications.</p> |                 |         |
| <b>Queries</b>     | Please contact <a href="mailto:PI-Beacon@nottingham.ac.uk">PI-Beacon@nottingham.ac.uk</a>  |                 |         |
| <b>To apply</b>    | Please apply online via <a href="#">the University of Nottingham application page</a>  |                 |         |