

## **Executive Summary Joint Working Agreement - Magnetic Resonance-Right Heart Catheterisation Clinical-Academic Fellowship**

*Partners:* This is a joint working agreement between Actelion Pharmaceuticals UK Ltd and the Royal Free London NHS Foundation Trust.

*Objective:* The objective of the project is to demonstrate the clinical safety and feasibility of catheter-augmented cardiovascular magnetic resonance (CMR) for the comprehensive assessment of pulmonary hypertension (PH). This is a novel technique that addresses the limitations of right heart catheterisation (RHC) such as exposure to ionizing radiation, accuracy of flow quantification, and the requirement for separate investigations to determine cardiac function in response to pulmonary haemodynamics.

*Funding arrangements:* Funding / resource arrangements will be split approximately 50: 50 between Actelion Pharmaceuticals UK Ltd. and the Royal Free London NHS Foundation Trust. Actelion will provide direct financial support for the project involving 7 milestone payments over a 3-year period. The Royal Free London NHS Foundation Trust will provide resources (including scans and personnel time) amounting to a near equivalent amount over the 3-year period.

### *Expected outcomes of the project:*

**Clinical:** The establishment of catheter-augmented CMR as a routine clinical investigation in the National PH Service. This will culminate in a publication regarding the feasibility and safety of the technique.

**Research:** The investigation of exercise haemodynamics in PH, and the assessment of the effects of vasodilator therapy on exercise metrics in PH, with associated manuscript submissions. The investigation of hepato-pulmonary haemodynamics in patients at risk of PH due to liver disease. The development of novel 'coupled' biomarkers of pulmonary pressure and cardiac function.

### *Benefits to patients include:*

- Removing exposure to ionizing radiation for these investigations. While the actual risk of radiation injury remains controversial, even low-level exposure to ionizing radiation is thought to contribute to the long-term risk of malignancy.
- Reducing hospital stay for these investigations by 50%. More streamlined and less time-consuming investigations: patients attending for a single test occupying one half-day rather than a full day.
- Allowing the simultaneous assessment of the cardiovascular response to altered pulmonary haemodynamics.

### *Benefits to Royal Free London NHS Foundation Trust include:*

- The development of a stable clinical platform for ongoing research and development of new biomarkers in PH.
- Providing an opportunity for workflow enhancement and technical development for interventional MR imaging techniques.
- More appropriate resource allocation: removing investigations from the cardiac catheterisation laboratory.

### *Benefits to Actelion UK include:*

- Supporting the introduction of a novel diagnostic technique that addresses the limitations of current RHC into routine PH clinical practice in the UK .
- Supporting the refinement of a technique that could offer significant research potential for the investigation of PAH / PH.
- Enhanced reputation as a valued healthcare partner in PAH.