

## Final Report Summary

# Characterising the fluorescence properties of the *Renilla reniformis* green fluorescent protein



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### 1. Introduction

LUX Biotechnology specialises in luminescence and fluorescence detection, utilising a range of novel bioluminescent and fluorescent proteins. To gain a better understanding into the optical properties of some of these materials, the company applied for TTOM funding to allow specialised measurements to be carried out at the Collaborative Optical Spectroscopy, Micromanipulation and Imaging Centre (COSMIC), based at the University of Edinburgh. LUX has recently gained access to a new purified form of a fluorescent protein (GFP) from a coral called *Renilla reniformis* (The Sea pansy). There is little information in the literature on *Renilla reniformis* GFP. Therefore the main objective of this project was to characterise the fluorescence properties of this protein, with the aim to broadening the life science and industrial applications of this tool. The purpose of the project is to carry out a range experiments on GFP including optical measurements and the use of different excitation sources.

### 2. Description of work

- a) The spectral properties and fluorescence lifetime of *Renilla reniformis* green fluorescent protein (GFP) were measured using spectrophotometer and a fluorescence lifetime system measurement system.
- b) LED's were tested as novel excitation sources for GFP.
- c) The photostability of GFP was tested using laser scanning confocal microscope.
- d) GFP was compared to inorganic fluorophores. Following exposure to a range of extreme environments, the decrease in fluorescence activity was measured using a fluorescent plate reader.

### 3. Conclusions

Overall the project was very successful. The data obtained has helped LUX to understand more about the optical properties of some novel materials, of which there is little information cited in the literature. Overall, the TTOM project has helped establish a good working relationship between LUX and COSMIC. There is now opportunity to seek further funding for future collaborations to investigate some of the questions that have arisen from the project.

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