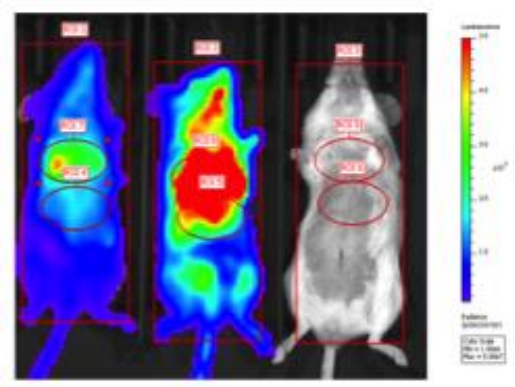
Lab Session Topic A

This Lab Session comprises two complementary Subsessions:

A.1. Monitoring drug treatment efficiency using whole animal live imaging

Introduction

The possibility to perform live imaging, from cells to animals, has greatly contributed to the advance of several fields of research including the discovery of new drugs and/or treatments. Understanding how small animal live imaging systems can be used to discover and validate new drugs or formulations is the goal of this practical session. Indeed, whole animal live imaging system will be used to detect bioluminescent parasites and evaluate drug treatment efficiency and kinetics.



Lab-assistants

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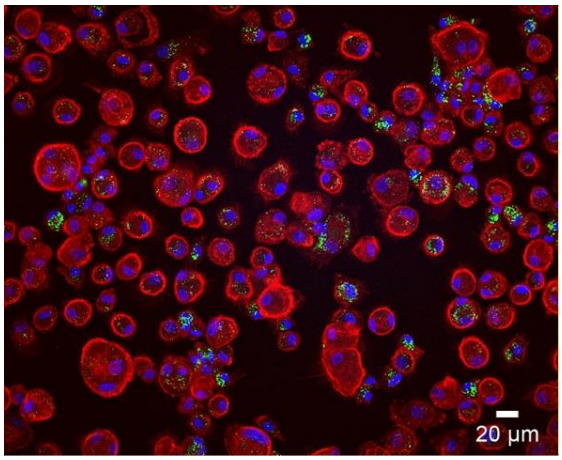
Relevant Facilities: https://www.ibmc.up.pt/research/research-facilities/animal-facility

A.2. High content imaging and analysis to evaluate phagocytic capacity

Introduction

Macrophages are considered professional phagocytes. They are critical for tissue homeostasis, as they uptake and degrade infectious agents, such as bacteria, and remove cellular debris from death or dying cells (1). Uptaken particles are processed into membrane-bound vesicles, called phagosomes, which undergoes a maturation process, involving vacuole acidification and also fusion events to ultimately form a phagolysosome (2).

In this lab session, differently exogenous stimulated human monocyte-derived macrophages will be exposed to commercially available killed bacteria. These bioparticles are conjugated with an almost non-fluorescent dye at neutral pH, which fluoresce brightly in acidic environments, facilitating phagocytic capacity quantification.



References

1. Aderem, A., and Underhill, D. M. (1999) Mechanisms of phagocytosis in macrophages. *Annu Rev Immunol* **17**, 593-623
2. Vieira, O. V., Botelho, R. J., and Grinstein, S. (2002) Phagosome maturation: aging gracefully. *Biochem J* **366**, 689-704

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Relevant Facilities:

https://www.ibmc.up.pt/research/research-facilities/advanced-light-microscopy/screening-center