OPTICAL IMAGING

Preclinical optical imaging relies on the detection of light generated from the reaction of bioluminescent enzymes with their substrates and from fluorescent proteins or dyes in small animals (Figure1).

Instruments for optical imaging in small animals are usually equipped with back illuminated CCD cameras for long time integration but also instruments with EMCCD or iCCd for real time acquisition are now available and used in different laboratories. The typical readouts of optical imaging instruments are measured in counts and then converted in photon fluxes. The conversion differs among detectors.

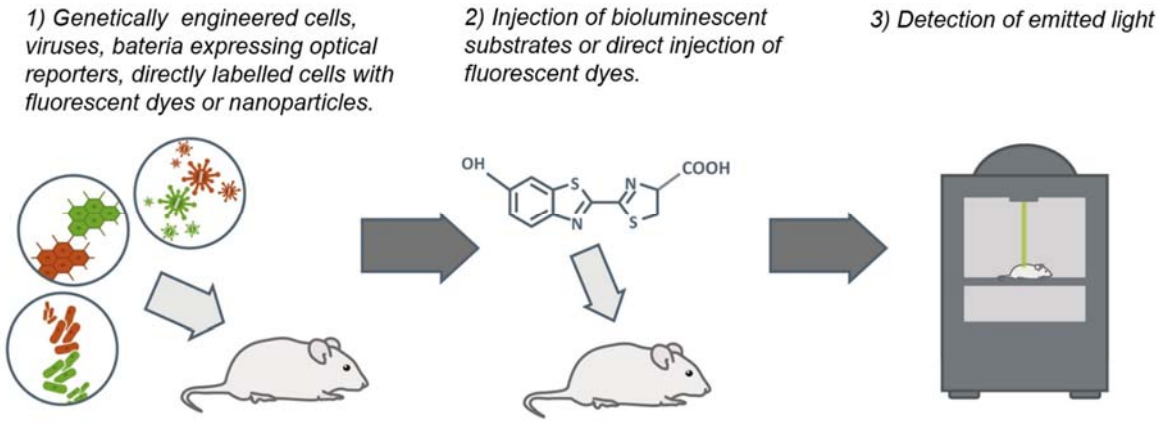

Figure 1. Schematic representation of preclinical optical imaging.

We aim to standardize the performance of preclinical optical imaging experiments but in order to achieve this we need to identify which are the factors that most likely influence the reproducibility of results. We proposed a simple in vitro experiments using bioluminescent cells and performed it in different laboratories .We determined that most of the variations is due to substrate used while linear range of detection do not vary using different imaging instruments, when imaging settings are kept the same. We are now in the phase of testing the reproducibility of in vivo experiments in two different labs.

Moreover, we would like to set guidelines on how to report information about optical imaging experiments in papers in order to ensure reproducibility.

References

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