# The Effect of Ambient Lighting on Laser Doppler Imaging of a Standardised Cutaneous Injury Model

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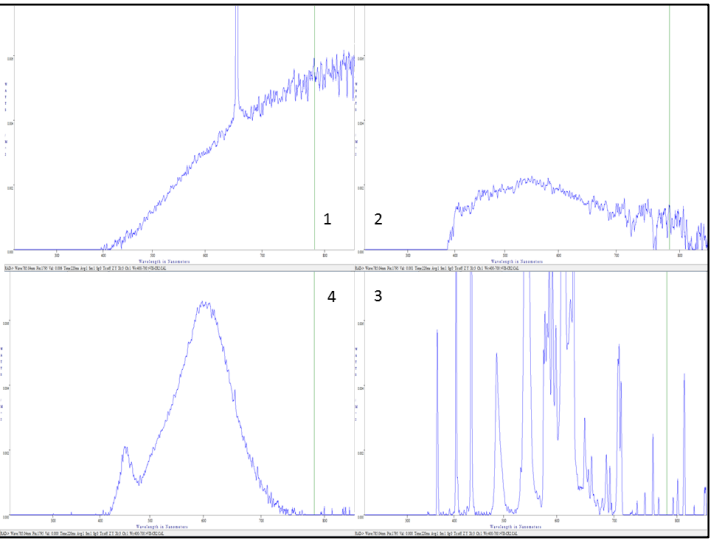
## Spectrometer readings of light intensity at 785nm under different lighting conditions




| Lighting Type | Light Intensity at 785nm (in milliwatts) |
|---|---|
| No light (darkness) | 0mW |
| 1. Halogen | 6mW |
| 2. Sunlight (overcast day) | 2mW |
| 3. CFL | 0mW |
| 4. LED | 0mW |

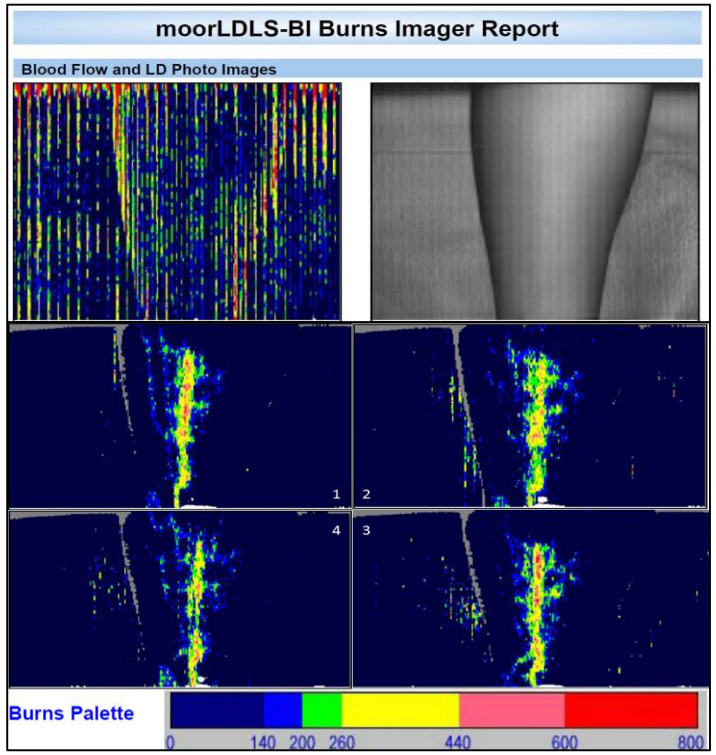
**Objective**: The aim of this study was to investigate the potential confounding effects of four different types of ambient lighting on the results of Laser Doppler Imaging (LDI) of a standardized cutaneous injury model.

**Methods**: After applying a mechanical stimulus to the forearm of a healthy volunteer and inducing a wheal and arteriolar flare (the Triple response), we used a Laser Doppler Line Scanner (LDLS) to image the forearm under four different types of ambient lighting: light-emitting-diode (LED), compact fluorescent lighting (CFL), halogen, sunlight, and darkness as a control. A spectrometer was used to measure the intensity of light energy at 785nm, the wavelength used by the scanner for measurement under each type of ambient lighting.

**Results**: Neither the LED nor CFL bulbs emitted detectable light energy at a wavelength of 785nm. The colour-based representation of perfusion unit values of the Triple response measured by the scanner was similar between darkness, LED, and CFL light. Sunlight emitted 2mW at 785nm, with a slight variation tending more towards lower perfusion unit values compared to darkness. Halogen lighting emitted 6mW of light energy at 785nm rendering the colour-based representation extremely difficult to interpret.

**Conclusions**: Based on our results, LED and CFL lighting does not appear to interfere with the results of LDI of cutaneous injuries. Both sunlight and especially halogen lighting have the potential to confound results. Any potential sources of sunlight should be reduced and halogen lighting completely covered or turned off prior to wound imaging.

## Laser Doppler Imaging scan results: Flux data colour-based representations under halogen (top), darkness (1), sunlight (2), CFL (3), and LED lighting (4)



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