

Influence of infrared illumination on the learning and activity behavior of rats

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Behavioral analysis of rodents is an important measure for determining the effects of experimental conditions such as brain lesions, genetic manipulations, and drugs. Near-infrared illumination (750nm to 1100nm) could be less intrusive when using video monitoring than visible light and also allow monitoring when rodents are more active during their dark cycle. However, little research has been done on the influence of such illumination on rodent behavior. Although it is generally believed that rodents cannot see in the infrared range (light with wavelengths > 750 nm), there is evidence that even 940 nm light can cause visual evoked potentials in the visual cortex. Therefore, it is important to assess the potential disruptive effects of illumination within this range.

Open-field activity and a hole board learning task were utilized to evaluate potential effects of overhead illumination conditions of 880 nm, 940 nm, visible white light or no illumination. For the learning task, two holes were baited with food and crumbs were scattered under the board to reduce the use of scent for locating the food. The effects of the infrared illumination on the rodent's ability to learn the location of the bait after repeated trials will be shown, as will the influence of the illumination on open-field activity.