



Prolonged Pain Research in Mice: Trends in Reference to the 3Rs

DOI: 10.1080/10888705.2013.741004

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pages 77-95

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Abstract

This literature review documents trends in the use of mice in prolonged pain research, defined herein as research that subjects mice to a source of pain for at least 14 days. The total amount of prolonged pain research on mice has increased dramatically in the past decade for the 3 pain categories examined: neuropathic, inflammatory, and chronic pain. There has also been a significant rise in the number of prolonged mouse pain studies as a proportion of all mouse studies and of all mouse pain studies. The use of transgenic mice has also risen significantly in prolonged pain research, though not as a proportion of all mice used in prolonged pain research. There has not been significant overall change in the number of mice being used per study for any of the 3 pain categories or for any of 3 common pain induction models: chronic constriction injury, partial sciatic nerve ligation, and complete Freund's adjuvant. Finally, although most authors referred to approval of experiments by an institutional nonhuman animal use committee, there were no references to the "3Rs" in a random selection of 55 papers examined. Given the proportionally high volume of mice used in invasive research and the gravity of studies that inflict lasting pain, these trends raise serious questions about whether the 3Rs principles of Replacement, Reduction, and Refinement are being appropriately implemented by researchers and institutions.

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Keywords

mice, pain, 3Rs, trends