Factors Affecting People’s Acceptance of the Use of Zebrafish and Mice in Research

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Summary — The species of laboratory animal used is known to influence people’s willingness to support animal-based research. An online experiment was used to test people’s willingness to accept the use of zebrafish or mice, two of the most commonly used species, in research involving either induced mutation (specifically, ethyl-N-nitrosourea [ENU] mutagenesis) or genetic modification, with and without regulatory oversight. Participants who were willing to support research on zebrafish (31.9%) were also willing to support the same research on mice. The participants expressed low levels of support for research involving ENU mutagenesis of zebrafish in both unregulated (30.7%) and regulated (38.5%) research programmes. A reason for the rejection of ENU mutagenesis was the perception that the procedure is painful. Some participants expressed a preference for the use of genetically-modified (GM) animal models over ENU mutagenesis, based on the belief that the former involves less pain and improves both the accuracy and efficiency of the animal models. Better informing the public about scientific practice, and scientists about public attitudes, may help reduce the disconnect between scientific practice and societal values.

Key words: ENU mutagenesis, genetic modification, laboratory animals, public attitudes.

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Introduction

Public attitudes toward animal research range from a desire for complete abolition to strong support (1–4). A wide variety of factors are known to influence public attitudes toward animal research, including: a) people’s personal and cultural characteristics, such as age (4), gender (5), and country (6); b) animal characteristics, such as species (7, 8) or animal sentience (9, 10); and c) research characteristics, such as the level of invasiveness (11).

In this study, we focused on three factors: species of animal, genetic modification techniques, and the regulatory framework (i.e. whether or not the presented research was subject to formal regulations to control or oversee how the animals were used). The most commonly used research species are the mouse, zebrafish and rat (12), and the number of animals used is now greater than ever, due to an increase in the use of genetically-modified (GM) animals—the majority of which are mice and zebrafish (12). People’s attitudes toward research animal use tend to differ, depending on the species involved (7, 8, 13). For example, members of the public tend to be less willing to accept the use of companion animals (e.g. dogs or cats), partly because these animals are viewed as having higher mental abilities compared to many other species used in research (14). Similarly, Animal Care Committee members have been shown to be less comfortable with research on companion animals and non-human primates (10), due to their beliefs about the sentience of these species. It has been shown that animals that are closer relatives of humans tend to evoke more-positive feelings (14), and those animals perceived as ‘cute’ tend to be preferred (15–17). Species such as fish and invertebrates are typically rated below mammals, and, as such, are often considered an appropriate replacement for mammals in research (18–20). However, the welfare of laboratory fish has received little academic interest, despite the mounting evidence that fish are sentient and have the capacity to feel pain (21).

Relatively new scientific technologies, such as genetic modification, can also affect attitudes toward animal research. Several studies have shown that support for either the creation or the use of GM animals is low (e.g. 22–24). People have expressed fundamental moral opposition to genetic modification (25), and concern regarding its ‘unnaturality’ and its potential to lead to unknown consequences (e.g. 26–28). The bulk of the research on public attitudes has focused on consumer views toward the use of GM animals for food production, but there is evidence that the use of GM animals for biomedical applications might be more acceptable than for food-related applications (24). However, there is public concern about the methods employed for the development of GM animals, including concerns about the increased numbers of research animals used due to the relatively inefficient and unpredictable nature of some genetic modification techniques (22, 25). Attitudes...