Science Advancement & Outreach
A DIVISION OF PETA

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Request for Information on Draft Priorities for the Muscular Dystrophy Coordinating Committee's Action Plan (NOT-NS-25-022)

Submitted online on November 6, 2025

1. Your thoughts on any of the draft priorities: (Please indicate which priority you are commenting on.)

   On behalf of People for the Ethical Treatment of Animals (PETA), which represents more than 10.4 million members and supporters worldwide, we are submitting comments on the priorities for the Muscular Dystrophy Coordinating Committee's Action Plan. To improve the lives of individuals affected by muscular dystrophies, the Muscular Dystrophy Coordinating Committee (MDCC) must prioritize research that is truly translatable and reproducible. This can only be achieved through innovative, non-animal, human-relevant science. To accomplish this, the MDCC priorities must replace all references to "animal models" with "human cell, tissue, or other human-based data" as the foundation for preclinical research. This includes replacing the mentions of improving animal models in the Combined List Translational Research Priority Topic 2; Mechanisms Research Priority Topics 1, 2 and 3; and Preclinical Translation Research Priority Topic 3.

   Currently, no cures exist for any form of muscular dystrophy, and available treatments only slow disease progression (1). In the case of Duchenne muscular dystrophy (DMD), decades of drug development using animals have produced treatments with limited applicability and ongoing safety concerns for humans (2–10). For Becker muscular dystrophy, there are currently no effective treatments, and all drugs tested in clinical trials have either failed or remain under investigation (11,12). Recently approved treatments underwent preclinical testing using animals before entering clinical trials—yet these tests on animals repeatedly failed to predict what has now been observed in the patient population.

   The scientific limitations of muscular dystrophy experiments on animals are well-documented. Even when animals exhibit symptoms resembling those seen in humans, the underlying genetic defects and disease mechanisms differ across species (13). Muscles with comparable anatomical locations can have vastly different fiber composition, metabolism, and function—especially between quadrupeds and bipeds (13,14). Species differ in lifespan and disease course: while humans with DMD live about one-third of their normal lifespan, affected dogs live roughly half of theirs—illustrating that disease progression cannot be meaningfully compared across species (13). In addition, about 20–

30% of canine DMD puppies die within two weeks of birth, likely due to diaphragm failure, a phenomenon not seen in newborn boys with DMD, and affected puppies exhibit growth retardation, reaching only ~80% of normal body weight at 1 month and ~60% at 6 months. Complete loss of ambulation—a hallmark of untreated human DMD—is not observed in young canine DMD dogs (15). Mouse model limitations further underscore this issue; mice engineered to lack dystrophin do not develop the clinical symptoms of DMD observed in humans (16,17). These fundamental species differences explain the repeated translational failures that have plagued the field.

To change this trajectory, and to align with broad agency-wide goals to advance human-based research, the renewed 2025 Action Plan must explicitly direct funding and infrastructure away from animal models and toward human-based research. These methods offer unprecedented opportunities to uncover disease mechanisms, identify therapeutic targets, and evaluate interventions with direct human relevance—without the confounding variables inherent in using animals to model human disease.

By removing reliance on animal experiments and prioritizing human-specific data, the MDCC can ensure that future research investments lead to translational breakthroughs and tangible improvements in the lives of those living with muscular dystrophies.

We commend the MDDC for including human-based and non-animal methods (NAMs) throughout the draft priorities. Specifically, the use of human cell/tissue models, -omics, and advanced non-invasive imaging techniques to study muscular dystrophy in Combined List Translational Research Priority Topic 4; Mechanisms Research Priority Topics 1, 2, and 3; and Translational Research Topic 4. Importantly, many of the NAMs highlighted in the draft priorities are already being used successfully in muscular dystrophy research. Published studies have applied these methods to elucidate disease mechanisms and improve diagnosis, including MD-derived induced pluripotent stem cell models (18), 3D skeletal muscle organoids (19), engineered skeletal muscle tissues (19–21), advanced brain imaging techniques (22), and machine learning–based diagnostic tools (23). These human-relevant methods are producing insights that inform therapeutic discovery and will enable more accurate preclinical evaluation.

It is also encouraging that the draft priorities acknowledge the fundamental biological differences between humans and mice. As the Preclinical Translational Research document notes, animal models cannot fully reflect the genetic, physiological, and pathological context of human muscular dystrophy. This underscores the importance of prioritizing and investing in non-animal, human-specific models that can more faithfully represent human disease biology.

Recent NIH initiatives are beginning to address these needs by expanding funding, training, and infrastructure for human-relevant approaches and establishing initiatives such as the Standardized Organoid Modeling Center (24–26). While the inclusion of NAMs in the draft Action Plan is an encouraging development that reflects this broader transition, it is still heavily focused on the use of animals. The MDCC must fully embrace human-based methodologies and align its efforts with ongoing NIH initiatives.

By doing so, the MDCC can help accelerate the adoption of human-relevant approaches in muscular dystrophy research.

The MDCC's emphasis on strengthening training and career development for researchers, seen in Combined List Cross-cutting Priority Topic 3, is an encouraging and necessary move toward sustaining progress in muscular dystrophy research and ensuring that the next generation of scientists is equipped with the most relevant and effective tools. To maximize the impact of this priority, it will be important that new training opportunities—particularly for students and early-career researchers—be grounded in non-animal, human-based methods across all areas of muscular dystrophy research. While the inclusion of training in artificial intelligence and machine learning represents an important step, the scope should be expanded to encompass the full range of non-animal approaches discussed in the draft priorities and in our earlier comments. Existing resources can serve as strong foundations for this effort (27,28). Centering MDCC-supported training initiatives on non-animal methods would provide researchers with the expertise to implement cutting-edge approaches and enhance the rigor, reproducibility, and overall quality of muscular dystrophy research.

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2. Recommendations for additional priorities for research or for improving access to care/services for people living with muscular dystrophy over the next 10 years:

   An important additional priority for muscular dystrophy research should be the systematic evaluation of the models currently used in the field. Conducting systematic reviews to assess the validity, reproducibility, and translational relevance of these research models would help ensure that only the most rigorous and appropriate approaches are prioritized (1). Such reviews can also identify potential methodological or institutional biases that favor certain models, regardless of their appropriateness for the research question.

Numerous resources and frameworks already exist to guide these systematic reviews (2–5), which the MDCC could use to identify models with greater clinical relevance and strategically prioritize future funding. This data-driven approach would optimize research investment, accelerate discovery, and ultimately improve outcomes for people living with muscular dystrophies.

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