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FROM THE EDITOR

Why Should We Care About What Using Nonhuman Animals in Human-Centered Research Suggests About Our Characters?

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As a scuba diver, I am routinely confronted by what happens when we humans ignore the reality that the health of our ecosystem affects the health of our species. For example, the shark population in Mexico's territorial seas has dramatically decreased in part because of illegal shark finning—removing fins from sharks and releasing the sharks back into the ocean.[1,2] The fins are widely prized as the main ingredient in shark fin soup—a stewed delicacy served in parts of Taiwan and Southeast Asia—and in several Eastern traditional cures.[3,4] In seas where shark populations have decreased secondary to overfishing, lower-level predators multiply unchecked, no longer the prey of sharks that have historically regulated their numbers.[5,6] Groupers—large-bodied, wide-mouthed fishes—decimate populations of smaller reef fish, such as parrotfish,[7] that locals depend on for food and income.[6,7] "*No nos preocupamos por los tiburones, y ahora no pueden protegernos*," my dive master José told me last year. "We did not concern ourselves with the sharks, and now they cannot protect us."

In other words, protecting other species can be one of the most paradoxically powerful ways to protect our own species.

Nonhuman animals have long been and continue to be routinely used in biomedical and behavioral research to promote human health. When SARS-CoV2 infections triggered a race to develop and scale global access to vaccines in 2020, 2 key innovations happened that affected the supply chain of animals created for science: experiments and trials regarded as essential were prioritized, and governments and researchers shortened vaccine production timelines.[8] As a result, the pandemic led to accelerated vaccine production processes requiring fewer research animals.[9,10]

During the same period, organs-on-chips (OoCs)—"engineered or natural miniature tissues grown inside microfluidic chips"[11]—showed potential to better reproduce the physiologic environment of human organs relative to in vivo models.[11,12,13] Nonhuman animal models have come under scrutiny, given mounting evidence that metabolic differences between species can leave translatability—the applicability of animal research to humans—subject to chance.[14,15,16] Moreover, preclinical laboratory animals experience significant and repeated stress that may affect the reliability of experimental data.[17]

More than ever, it is time to reevaluate the utility of nonhuman animal-based research as it is currently practiced. Reasonable people can still disagree about when, why, and how nonhuman animals should be sacrificed for human health, but we now know that we reap lifesaving benefits even when we sanction fewer nonhuman animals' cultivations and deaths for science.

This theme issue of the *AMA Journal of Ethics* is an investigation into what this revelation means for the future of human-centered science. Contributors share their expert opinions on clinical, ethical, legal, and policy questions raised by animal experimentation in human-centered research. They also make the case for why and how to model regard for animals in laboratories; and they interrogate current decision-making principles and societal values that govern treatment of nonhuman research animals, while outlining the philosophical underpinnings of animal rights. Questions about power, hierarchy, and consciousness are interwoven in this issue: What do we owe other species relative to our own and why? What definition of consciousness should we use to decide the value of a life? This issue ends on a hopeful note, highlighting advancements in disease and biological modeling that foreshadow a more evidence- and value-driven medical science pathway.

For some readers, nonhuman animal use in human-centered research may seem too far removed from the primary care clinic or operating theater to be of import. Yet the patients of tomorrow rely on the quality of research done today. Many of medicine's great breakthroughs, from Louis Pasteur's germ theory of disease to the Pfizer-BioNTech COVID-19 vaccine, have emerged from the laboratory.

As my dive master José recognized, our instinct is to see our ecosystem as a metaphorical pantry stocked to meet our needs and wants. However, building mutually beneficial relationships with other life forms is a way to ensure that humanity adapts and thrives in today's changing environment. This issue is a critical examination of human-centered research and a conversation about why and how to channel such research into ethical and technological evolution.

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