

PERSPECTIVE



When the science alone is not enough: embracing our responsibility as science communicators

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The US biomedical research enterprise has led the world in driving medicine forward but now faces unprecedented threats. Systematic efforts to defund and dismantle the academic research infrastructure, compounded by misinformation and questionable public support for science, have already impeded innovation and discouraged students from pursuing careers in research and healthcare, which ultimately will harm patients. This moment calls on us, as scientists and physicians, to effectively communicate the relevance of our research to the public and elected officials and ensure that the value of basic, translational, and clinical scientific inquiry in developing novel treatments for debilitating medical and psychiatric conditions is fully appreciated. In this *Perspective*, we highlight concrete, actionable steps to robustly engage in science communication, grassroots advocacy, and early education efforts to rejuvenate the vigorous research environment that is essential to the health and well-being of the public.

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Biomedical research saves lives. Within the past five decades, we, as scientists and clinicians, have eradicated multiple infectious diseases, developed cures for pediatric brain cancer, and deployed transformative pharmacological, neuromodulatory, and psychotherapeutic treatments for psychiatric illnesses. However, public understanding of the link between scientific innovation and medical breakthroughs remains limited, as evidenced by persistently modest public support for and trust in scientific research [1, 2]. A recent survey of the US public revealed that 45% of adults view scientists as effective communicators [2]. These trends are of particular concern in the context of deep, pervasive funding cuts to biomedical research and a lack of respect by the current administration for evidence-based and scientifically informed healthcare-related decision-making [3]. This threatens our nation's stature as the global leader of scientific innovation. The potentially catastrophic consequences of these actions are not adequately portrayed in the general media or represented in public consciousness. Given the current climate, strong public support for science is vital to motivate decision-makers to ensure adequate funding for research and to challenge misinformation that is being used as justification to defund research and implement misguided healthcare policies.

The threats posed should serve as a potent reminder and motivator for scientists to redouble their efforts to translate scientific findings and highlight their relevance for the broader public. The present circumstances underscore that this responsibility—enhancing public awareness and the public's understanding of the importance of biomedical research—is a critical step towards engaging the public with the hope that they will demand from lawmakers appropriate funding for biomedical research and the accurate portrayal of scientific evidence. Here, we outline three ways scientists can engage in science communication,

including: (1) participating in ongoing science advocacy and public education efforts at their respective institutions and beyond; (2) working to incorporate robust science communication training into graduate education and faculty training; (3) formulating ways to infuse the value and excitement of scientific discovery into primary education, thereby inspiring the next generation of biomedical researchers; and (4) tailoring public presentations for different racial, ethnic, and community groups to facilitate optimal understanding of the value of scientific discoveries in relation to the health needs of those communities.

It falls on the scientific community to highlight the indispensable role of science in advancing health and the tremendous returns on investment in biomedical research. Partaking in science advocacy through field-specific professional organizations can be an effective approach. Given the current political and funding climate, initiatives to protect and support animal-based research are especially critical. In this vein, a notable example is ACNP's partnership with Americans for Medical Progress, the group responsible for organizing Biomedical Research Awareness Day (BRAD). BRAD is an international outreach program that provides resources to host community events geared towards demystifying the process and innovations of animal research in biomedicine, including dispelling common myths and underscoring its role in the novel treatment development pipeline, particularly in relation to psychiatric illness [4]. Importantly, BRAD facilitates crosstalk among animal research professionals and the public, cultivating true grassroots advocacy, in addition to encouraging students and faculty to organize their own outreach events and develop new pilot initiatives. Another impactful strategy is collaborating with patient advocacy groups, of which there are several in the domain of mental health. The National Alliance on Mental Illness (NAMI) is the largest grassroots mental health awareness group in the

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country, partnering with universities, industries, and other non-profits across the country to build multi-stakeholder support for patients suffering from mental illness [5]. Directly connecting with patient advocacy groups to explain how specific research programs can contribute to advancing care for a given disease can be deeply meaningful, as these organizations can then aid in dissemination of findings to patients and providers. Lastly, establishing frequent and direct contact with elected representatives is vital to cementing continued public support for biomedical research. Concrete steps to prepare for an effective dialogue with lawmakers include: delineating a specific issue and/or policy to address; articulating how a given science-forward policy can directly impact the health of their community; and, finally, prompt follow-up to continue discussions that will lead to action. We emphasize that it is imperative for scientists to stick to the science and its impact, avoiding interactions that could be interpreted as partisan.

While science communication and teaching skills are not core competencies in most STEM graduate programs, they should be considered a high priority. The ability to communicate effectively using simple terms is an asset that should be valued in academia. Scientists with these skills would be better prepared and motivated to interact with the public in ways that would engage them in advocating for the science necessary for discoveries that will improve health. Structured media training would be highly beneficial from the standpoint of ensuring scientists can effectively convey the importance and health-related relevance of scientific findings. This is particularly important when presenting data related to issues that have been devalued and stigmatized, such as the use of animal models to understand mechanisms underlying human illness and mental health. There exist multiple mechanisms, especially for trainees and early-career scientists with deeper interests in science communication, to gain further training along with real-world experience. Prominent examples include the Mass Media Science & Engineering Fellowship sponsored by the American Association for the Advancement of Science (AAAS), Sense About Science—an initiative geared specifically towards countering misinformation in media portrayals of science, and ComSciCon—a graduate-student run organization that hosts local and national science communication workshops. Academic research institutions could demonstrate their commitment to public engagement in science by incentivizing scientific communication and valuing it as a criterion in faculty hiring and promotion processes.

The longevity of the US scientific enterprise depends on a public that understands and supports the value of scientific innovation. Such an understanding should ideally begin during childhood. Specifically, we can advocate for integration of discovery-based learning methods into traditional curricula, which have been shown to promote analytic reasoning and knowledge acquisition [6]. More directly, scientists should take advantage of local community- and university-sponsored science outreach events geared towards children and families. Such venues provide an invaluable platform for scientists to engage directly with young minds, to explore with them their curiosities, and to break stereotypes about what science entails, demonstrating that it can be used to solve problems with broad societal implications. Equally—if not more—important is the opportunity to interact with parents at outreach events, sharing ways to nurture their children's specific curiosities and passions, including, for instance, local resources or organizations that could support their interests. Focusing efforts on children will ultimately create a scientifically informed community and contribute to developing the next generation of scientists and clinicians.

To conclude, current circumstances are facilitating the dismantling of biomedical innovation in the US and are seen as demoralizing by the next generation of researchers and doctors. Now is the time for action, as scientists and physicians, to make our work accessible, prioritize communicating its relevance and impact widely, and to inspire young minds to appreciate the beauty and value of the scientific method. Such efforts are critical to support a scientific environment that incubates the discoveries and cures that move our society forward.

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