



July 31, 2020

Devon Crawford, Ph.D.
Office of Science Policy & Planning
National Institute of Neurological Disorders and Stroke (NINDS)
6001 Executive Boulevard
Rockville, MD 20852

Re: NOT-NS-20-062: Request for Information (RFI) on Developing an Online Educational Resource for Training in the Principles of Rigorous Research

Dear Dr. Crawford,

On behalf of the neuromuscular disease (NMD) patient community, the Muscular Dystrophy Association (MDA) thanks the National Institute of Neurological Disorders and Stroke (NINDS) for the opportunity to comment on the Institute's Request for Information (RFI) entitled, "Developing an Online Educational Resource for Training in the Principles of Rigorous Research."

Over MDA's 70-year history, we have contributed over \$1 billion to neuromuscular disease research, second only in the United States to the U.S. Government. We are proud to continue to support innovative NMD research by contributing to efforts to train the neurological scientific and research community in best practices of rigorous research. Please find our answers to each question contained within the RFI below.

What are the most important principles of rigorous research for all scientists to understand?

We believe there are several important principles of rigorous research that should be understood by all scientists. First, it is critical to include the appropriate controls (positive and negative) to ensure well designed experiments. It is also important to make hypotheses and design experiments that can answer the *a priori* questions posed. Ensuring proper power for the experiment (e.g. different animal strains and models have inherent variability which may require additional numbers) is crucial to maintain a high level of rigor within research. Replication of the data, both within a lab and across labs, is important as is reporting both positive and negative data at all times when an experiment is completed. Finally, maintaining good blinding and guarding against ascertainment bias is salient to maintaining a well-designed study.

For each career stage (undergraduates, graduates, post-docs, and faculty), what are the best teaching practices to use (i.e. how to convey information in a lasting and impactful way)?

MDA believes that at all levels, hands-on one to one teaching is most valuable and would likely lead to the longest lasting impact. For undergraduates, individualized training about the scientific

method and how to conduct rigorous research is most important so that they carry that structure with them into their graduate career. Having grad students or postdocs provide that training also offers them the opportunity to hone their mentoring skills and make sure they are also up to date on best practices.

For graduate students, a combination of video/online tutorials and articles as well as personalized training from their mentor could be effective as they start to learn more on their own. For post-docs, if they have not been well schooled in how to conduct rigorous research prior to this point, having in-house materials (e.g. protocols, videos, papers) developed by the lab they are joining would be helpful. For faculty, peer to peer teaching and feedback is critical to ensure that standards do not slip, and messaging about the importance of rigor must be consistently communicated within and across universities.

For each career stage, what is the ideal delivery structure and how often should these principles be reinforced?

In addition to the suggestions in the previous response, we would add that NINDS-led webinars could also be a useful tool to ensure everyone is reading from the same playbook about how to be rigorous. NINDS could even consider making it a requirement to view the webinar prior to issuance of a Notice of Award.

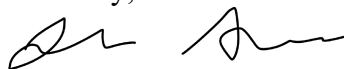
Additionally, while annual training could be helpful for faculty, one initial barrage of videos, one-on-one training, or articles should be sufficient for new lab members at the undergraduate, graduate, or post-doc stage.

If delivered as an online resource, what is the most effective balance between different educational media (e.g. text, video, interactive activities)?

We recommend the more interactive the online resource, the better. This is especially true for earlier stage researchers. A combination of videos and text along with hypothetical scenarios that require thoughtful responses would be best.

We thank NINDS for the opportunity to comment on educational resources. For questions regarding MDA or the above comments, please contact Jonathan Sabbagh, Scientific Portfolio Director, at jsabbagh@mdausa.org.

Sincerely,



Jonathan Sabbagh, PhD
Scientific Portfolio Director