

Workshop on Responsible Communication of Basic Biomedical Research: Enhancing Awareness and Avoiding Hype

Executive Summary

From grant applications and journal articles to press releases and news stories, reports of scientific advances can oversell or misrepresent the findings. To explore the effects of this hype on the scientific enterprise and public trust, a workshop was organized by the Federation of American Societies for Experimental Biology and hosted by NIH's National Institute of General Medical Sciences in Bethesda, Maryland, on June 22, 2017.

The meeting brought together a diverse group of experts who communicate about basic biomedical research: scientists, including those who study communications; academic and corporate communications officers; policy advisors; and journalists. Participants discussed the problems of hyped research as well as the difficulties of communicating in today's media landscape, motivations for certain forms of science communications, the inherent features of science that make communicating about it challenging, and the role of press releases in promoting research progress. Although the panelists focused on basic biomedical research, their discussions and suggestions were relevant to science communicators working in other fields. Their recommendations included:

- Provide communications training to scientists throughout their careers, and develop toolkits to help them further hone those skills.
- Change the incentives of communication, focusing more on the scientific process and less on a single research study.
- Embrace and help others understand the uncertainty in science.
- Develop and follow a logic model to outline both long-term and short-term communication goals, and then establish the best tactics.
- Tell a good story that conveys researchers' excitement about the discovery process and harnesses the audience's sense of curiosity.
- Use metaphor, imagery, and illustrations to explain complex concepts or techniques.
- Make use of the full range of communication platforms to reach different audiences, from YouTube and Instagram to Twitter, blogs, and online whiteboards.
- Rather than issuing press releases on a single finding and pitching new results, share leads on work in development and scientists who can comment on stories in the news.
- Consider which news outlet, including local and niche ones, can best reach the intended audience.

For more details, see the [workshop agenda](#).

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WORKSHOP OVERVIEW

From grant applications and journal articles to press releases and news stories, reports of scientific advances can oversell or misrepresent the findings. This “hype” can negatively affect the scientific enterprise and public trust, and make scientific data, in proper context, seem less interesting. Recent news articles and studies have focused on the issues of hyped clinical findings, but few have highlighted the hype challenges for basic biomedical research, which is further away from clinical application and, thus, often harder for the public to understand and appreciate its significance.

To begin a focused discussion on this topic, the June 22 workshop brought together a diverse group of experts who communicate about basic biomedical research: scientists, including those who study communications; academic and corporate communications officers; policy advisors; and journalists. These science communicators explored the problems of hype in basic research, the incentives that encourage it, and recommendations for avoiding it.

The workshop was organized by the Federation of American Societies for Experimental Biology (FASEB) and hosted by the National Institute of General Medical Sciences (NIGMS) on the National Institutes of Health campus in Bethesda, Maryland. It was [videocast](#) and followed on Twitter ([#BasicBioComm](#)). This summary offers a broad overview of the day’s discussions.

OPENING REMARKS

Jon Lorsch, PhD, *Director, National Institute of General Medical Sciences (NIGMS)*
Hudson Freeze, PhD, *President, Federation of American Societies for Experimental Biology (FASEB)*

Jon Lorsch described how, when he first joined the Institute in 2013, he was struck by the number of press releases from journals and universities that crossed his desk each day. Because many of them focused on a single finding, he said they often did not accurately reflect the way scientific progress usually occurs, with multiple labs working over many years on a series of studies. Another concern was that the releases hyped or misrepresented the study to make the results sound more exciting. These efforts to make the science more accessible sometimes had negative consequences, such as making solid science a target for reports on wasteful research. Dr. Lorsch began to think about all the players involved in the science communications process and how they contribute to hyped findings. He shared examples of efforts underway at NIGMS to shift the focus from single findings to broader stories of progress in a lab or field.

Hudson Freeze agreed. He noted in his opening remarks that the workshop organizers sought to draw together different perspectives across the science

communications ecosystem. The goal was to discuss best practices for conveying accurate information about basic biomedical research while minimizing the risk of overinterpretation or overemphasis on a particular finding.

KEYNOTE PRESENTATION

Erika Check Hayden, *Director, Science Communication Program, University of California, Santa Cruz*

The workshop commenced with a keynote address by Erika Check Hayden, an educator and award-winning journalist. Ms. Hayden offered this definition of hype, which she attributed to NIGMS' Deputy Director Judith Greenberg, PhD: "Exaggerating the outcomes of research, for whatever motives people have, leading to potential negative effects due to inaccurate portrayal of research."

Ms. Hayden remarked that the "communication ecosystem is more disjointed and fragmented than ever before." As she noted, science now lacks a single spokesperson, such as a Carl Sagan, to champion it and put findings into perspective for a broad audience. She also noted a decline in the number of media gatekeepers, which has contributed to more direct channels for reaching people with scientific content. Today's communication landscape includes traditional channels as well as new ones across social media. This new media landscape has changed how science is interpreted; as a result, science communicators no longer have the same measure of message control.

Ms. Hayden then outlined some principles for successful and accurate communication that are relevant to scientists as well as professional communicators:

- Delight in the details. Small facts about the research process can be the most interesting part of the basic biomedical story and can harness people's innate sense of curiosity.
- Tell a good story that conveys scientists' excitement about their research and the discovery process.
- Use a broad array of tools that make use of new communication platforms to reach different audiences, from YouTube and Instagram to online whiteboards.
- Provide training. Schools and universities should train science students and faculty to be better communicators.
- Encourage diversity. Schools and universities should strive to attract greater numbers of young scientists who are more representative of the population at large, including women and underrepresented minority groups. This, in turn, will enable science communicators to reach more diverse audiences with messages that truly resonate.

PANEL 1: How does science communication affect the biomedical research landscape?

Bruce Alberts, PhD, Chancellor's Leadership Chair in Biochemistry and Biophysics for Science and Education, University of California, San Francisco

Thomas Baldwin, PhD, President-Elect, FASEB (moderator)

Angela DePace, PhD, Associate Professor, Systems Biology, Harvard Medical School

Lee Ligon, PhD, Associate Professor, Biological Sciences, Center for Biotechnology and Interdisciplinary Studies, Rensselaer Polytechnic Institute

Regina Nuzzo, PhD, Gallaudet University and Freelance Science Journalist

Ivan Oransky, MD, Distinguished Writer in Residence, New York University's Arthur Carter Journalism Institute; Co-Founder, Retraction Watch

Fintan Steele, PhD, Chief, Corporate Communications & Culture, SomaLogic

The panelists discussed the need for scientists to be able to communicate with one another as well as with the public and others in the community. Said Angela DePace, "Public engagement might just be different scales of resolution—everyone is a scientist but at a different scale of resolution."

Panel members also agreed that communicating science creates a risk for hype, as there is an emphasis on results that translate directly to clinical practice. As noted by Lee Ligon, "Science is hard. It's tedious. And there's a lot of pressure on scientists to produce exciting results and to promote those exciting results" for advancing their careers and enhancing their institutions' reputations. She stressed the importance of training basic biomedical researchers and other science communicators to embrace the complexity of science, not to oversimplify it.

Dr. Ligon also encouraged science communicators to embrace the uncertainty in science and said that scientific discourse is full of theories and hypotheses. Fintan Steele said it's critical to acknowledge that science is uncertain. Regina Nuzzo added that when discussing research, science communicators should clearly convey the concept of uncertainty, especially in the context of explaining a study's statistical data. This will help the public, scientists, journalists, policymakers, and others better understand that uncertainty is part of the scientific process.

Several panelists commented on the need to change the incentives for science communications. Bruce Alberts, for example, discussed the importance of challenging early career scientists to be innovative and to think outside the box. He said the peer review process, both at funding agencies and journals, emphasizes track record and publishable results, potentially constraining the discovery process and limiting unexpected breakthroughs.

Shifting the focus from promoting results to describing the research process will not be easy. As Ivan Oransky noted, the entire scientific enterprise demands hype. Scientists base their research on what will be funded. Journals make decisions on what manuscripts to publish according to which ones will be cited or get press attention. Moreover, journal guidelines often evoke the Ingelfinger rule (stating that

scientific journals will not accept results that have been previously reported elsewhere), further complicating communication efforts to tell stories beyond a single study.

And finally, all panel members noted the need to communicate the excitement of science in a more tangible way. For example, whether writing a summary page of a thesis or communicating why they wanted to do research in the first place, scientists should make their personal narrative part of the story and share the satisfaction that comes from the process of discovery.

PANEL 2: How does science communication affect public perception of science?

Joseph Cappella, PhD, Gerald R. Miller Professor of Communication, Annenberg School for Communication, University of Pennsylvania

Anthony Dudo, PhD, Associate Professor, Stan Richards School of Advertising and Public Relations, University of Texas at Austin

Kirk Englehardt, Vice President of Marketing and Communication, Community Foundation of Broward

Erik Fatemi, Senior Vice President, Cornerstone Government Affairs

Hudson Freeze, PhD, President, FASEB (moderator)

Ivan Oransky, MD, Distinguished Writer In Residence, New York University's Arthur Carter Journalism Institute; Co-Founder, Retraction Watch

Matt Shipman, Research Communications Lead, University Relations, North Carolina State University

In this discussion, panelists explored how science is perceived and why it can be confusing, especially to nonscientists. They noted the public tends to mistrust and discount findings that aren't aligned with their own belief systems. Panelists cited climate change and genetically modified foods as examples. This tendency is bolstered by the fact that different interpretations of science, due to its very nature, often lead to opposing viewpoints, such as recommendations for when and how often to undergo cancer screening. Moreover, unchecked errors and biases do sometimes occur, said Ivan Oransky. Though rare, fraud, retractions, and misconduct are part of the scientific landscape. "We need to be up front and focus on the steps we take to correct these issues," Dr. Oransky said. Doing so will help to build confidence in the science that's published and help the public to see that scientific consensus can emerge as more studies are produced.

Kirk Englehardt reminded panelists that not all science communication is dishonest, overblown, or inaccurate. Cutting through today's media noise often depends on who has the loudest voice. He said science communication, when done well, boils down the message, tells a story, and is laser focused on the broader communications goal.

Building on this theme, Anthony Dudo indicated that basic marketing principles also can be used to target audiences, noting that the public is not inherently predisposed to care or think deeply about science. To engage these audiences, science

communicators should look for common ground and shared values. He also urged science communicators to make use of entertainment media, such as interactive video games, especially in reaching out to a younger audience.

Panelists agreed that careful consideration should be given in deciding when to go public with findings. Joseph Cappella suggested that not every finding out of every lab should be publicized; waiting until findings are replicated can prevent premature announcements.

Panelists were optimistic that science communicators can convey basic biomedical findings in a way that will resonate with the public. Erik Fatemi pointed out that during his time on Capitol Hill, legislators generally viewed the scientists and other science communicators who visited them as trustworthy and in positions of authority. Whether seeking funding or defending policies, those who were dynamic and passionate about their work were much more likely to have positive outcomes than those who could not convey such enthusiasm, he said.

Panelists also offered tips for communicating with journalists. Matt Shipman cautioned against paying too much attention to top-tier publications and news outlets, saying that local outlets and smaller niche publications often are better candidates for raising awareness. He suggested that scientists should be willing to take time to discuss topics with their communications offices, the media, and members of the community. Above all, “Be authentic and convey passion about the research. Describe why you are doing this work and what it means to you,” Dr. Shipman said.

PANEL 3: What are the goals and incentives of science communication?

Anthony Dudo, PhD, Associate Professor, Stan Richards School of Advertising and Public Relations, University of Texas at Austin

Kirk Englehardt, Vice President of Marketing and Communication, Community Foundation of Broward

Judith Greenberg, PhD, Deputy Director, NIGMS (moderator)

Erika Check Hayden, Director, Science Communication Program, University of California, Santa Cruz

Jocelyn Kaiser, Staff Writer, Science

Lee Ligon, PhD, Associate Professor, Biological Sciences, Rensselaer Polytechnic Institute

Fintan Steele, PhD, Chief, Corporate Communications & Culture, SomaLogic

In addressing incentives for promoting findings, panelists were quick to point out that incentives differ according to profession. As Jocelyn Kaiser said, “I want to produce stories that people will read.” Catchy headlines and intriguing leads are an integral part of engaging with audiences. Publishers track metrics on articles, such as the number of people who read the article online, how many people download the article, and how many times the content is shared and commented on. “We’re judged these days by how many hits [our stories] get,” she noted.

Fintan Steele further illustrated how incentives can differ by stakeholder group. He told a story of how he worked with a university to break the news on a potential method for identifying people at risk for heart attack. Dr. Steele explained, “We ran into a series of mixed goals.” The principal investigator wanted additional grants, the PI’s university was seeking recognition, and the university who handled the samples wanted at least equal or top billing. But no one said anything about informing the people who might one day benefit from the advance. Ultimately, he said, all three decided to back up and ask, “Why are we really doing this release, and who are we trying to reach?” Addressing those questions helped to better define their outreach strategy and audience selection.

Several panelists noted that scientists who engage in communications about their research must walk a fine line, balancing between too much exposure in the press and not enough. Matt Shipman related an example of a scientist who was nearly denied tenure because his department was concerned he took time away from his research when he worked with a documentary film company to feature his work in a program. As noted by Lee Ligon, when her university issues a press release about a cancer finding from her lab, she often gets calls from patients looking for a cure for cancer. She cautioned science communicators to guard against raising false hopes and to set realistic expectations in reports about the work.

According to Anthony Dudo, scientists surveyed say it’s gratifying to communicate science to the general public. They said it fulfilled a sense of duty, upheld a common morality, and even improved their science. In setting goals, he encouraged scientists to approach communications as they would any other scientific study. They should develop and follow a logic model to outline both long-term and short-term goals, and then establish the best tactics. He encouraged scientists to “answer the ‘why’ before applying the tactic.”

As for press releases, panelists said opinions of them depend on the perspective. Universities tend to value them, as they can help build reputations. Journalists noted that they see far too many of them, which makes it difficult to distinguish between solid and exaggerated findings. All agreed there’s a real danger of hype with this form of outreach and that press releases aren’t always needed to share information with the intended audience.

To avoid hype, Jocelyn Kaiser suggested that scientists and institutional communicators include caveats in the press release that show clearly the limitations of the study. Kirk Englehardt suggested that scientists build in checks and balances by carefully reviewing drafted press releases. These reviews will help ensure the message is accurate. Panelists also said to use press releases judiciously and, when appropriate, target them for the publications whose audience will be most interested in the advance.

PANEL 4: Better practices: Re-examining decision making on communicating scientific results

Angela DePace, PhD, Associate Professor, Systems Biology, Harvard Medical School

Lee Ligon, PhD, Associate Professor, Biological Sciences, Rensselaer Polytechnic Institute

Jon Lorsch, PhD, Director, NIGMS (moderator)

Sara Reardon, Reporter, Nature

Matt Shipman, Research Communications Lead, University Relations, North Carolina State University

The final panel continued the discussion on press releases with Matt Shipman relaying some general impressions. He said that only 35 to 40 percent of press releases are “worth it.” Again, it hinges on targeting the press release to the best outlet. But the value of press releases to mainstream media, he estimated, was less than 5 percent.

Sara Reardon said that she rarely takes information from press releases, noting it’s hard to “break through the noise.” The best press releases show how the current study moves the field forward and helps reporters put the information in perspective by describing how far the finding is from the clinic. She cautioned against using a prewritten quote and urged scientists to be available for questions and follow-up.

In the closing discussion, the workshop panelists offered specific recommendations for the full range of science communicators:

- Build a scientific community that is more representative of the public at large. This will enable a diverse public to connect with scientists who have similar backgrounds and life experiences.
- Provide training in communications to scientists throughout their scientific career, and develop toolkits to help them further hone the skills needed to describe and discuss their work.
- Change the incentives of communication, focusing more on the scientific process and less on a single research study. Make the goal to show innovation at all levels of the scientific process and not just the impact of the research on clinical practice.
- Develop and follow a logic model to outline both long-term and short-term communication goals, and then establish the best tactics.
- Put the information in context. It may not be a finding that’s ready for clinical practice, but it can be a vital step in reaching that goal. Show how it is a small step toward something bigger. Indicate whether it will have an impact on a particular audience.
- Describe the caveats and next questions to be explored.
- Talk to family, friends, acquaintances, and others in existing social networks about science.

- When working with journalists, consider their needs. Email a “pitch” or description of the research, and be aware that timeliness is critical and jargon stands in the way of accessibility.
- Use digital methods, such as whiteboards, video, and/or direct-to-consumer venues, such as Facebook, YouTube, Twitter, and Instagram.
- Use metaphor, imagery, and illustrations to help explain complex concepts or techniques.
- Avoid jargon, as it creates an immediate barrier.
- Become acquainted with the resources that are available, such as online courses and publications that can help improve communication skills.
- Convey to the audience why this work is important from a personal perspective. Create a narrative. Be passionate. Do not be afraid to admit that there is still more work to be done.
- Rather than pitching new results, share leads on work in development and scientists who can comment on stories in the news.
- Consider which news outlet can best reach the intended audience. Most findings or stories should not be pitched to the *New York Times* and other national outlets. It’s often more effective to target local or niche publications.