

The pipeline to progress:

**Securing tomorrow's
breakthroughs**

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We asked biomedical engineers about federal funding. Their answers reveal both the pipeline pressures facing our field and our readiness to secure its future.

Across 88 research areas, from pacemaker innovators to brain injury researchers, the message is the same: When the pipeline to progress is threatened, the entire biomedical engineering ecosystem suffers.

“We’re the team behind the team behind the team. We make a doctor’s job possible in many ways. Without our products, they wouldn’t have the tools to do what they need to do to help that patient,” said BMES Fellow Zac Dooley, senior manager of Research & Testing, Orthofix Medical Inc.

Community Insights Collection:
July–August 2025 via online questionnaire.
Response rates varied by question
(63%–100% response rate).

Conducted by:
Biomedical Engineering Society (BMES)



The pipeline to progress challenge

BME drives breakthrough technologies that touch every aspect of daily life, yet the pipeline creating these innovations is facing unprecedented pressure.

Eric Ledet knows innovation intimately. As director of Rensselaer Polytechnic Institute's Severino Center for Technological Entrepreneurship, he holds 23 patents and has spent his career turning biomedical breakthroughs into reality.

So, when he imagines waking up in a world without BME, the picture he paints is startling in its immediacy: "For a lot of people, the world would look blurry, right? It would look blurry because there's so many people that wear glasses and contact lenses. For a lot of other people, if they woke up in the morning and there was no biomedical engineering, it probably would not have been a restful sleep because many people rely on technology for a good night's sleep."

These breakthrough technologies, from contact lenses to CPAP machines and from pacemakers to smartphone health monitoring, flow from a pipeline that connects university research to industry development to patient care.



THE CURRENT CHALLENGE

The pipeline to progress faces uncertainty as funding decisions create ripple effects throughout the innovation ecosystem. 2025 BMES President Shelly Sakiyama-Elbert, Ph.D., who is a professor and vice dean of research and graduate education at the University of Washington School of Medicine, said, “We’ve definitely had some NIH grants that were terminated. We’ve had a lot of grants that are delayed either in the review process or just sort of in limbo as new levels of review were added or policies were changed after grants were submitted or even funded. I think that it is really challenging for folks to plan and to sustain their research.”

WHY WE LISTENED TO THE COMMUNITY

To understand how pipeline pressures affect the entire BME ecosystem and gauge the community’s readiness to secure the future, BMES reached out to BME professionals across academia, industry and government. What emerged was remarkable consistency across diverse research areas and career stages.

Here are the results.



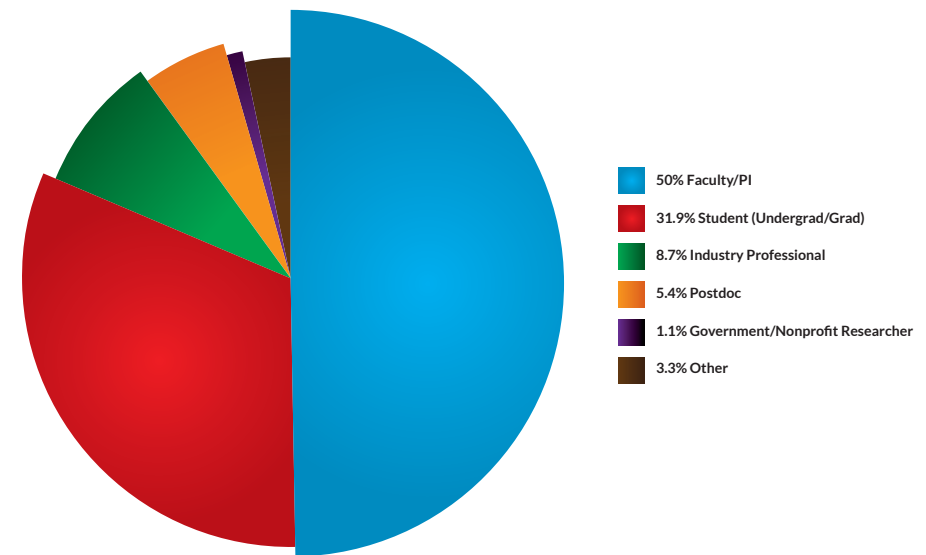
Survey demographics: Who filled out the survey

THE BREADTH OF BME INNOVATION: 88 RESEARCH AREAS

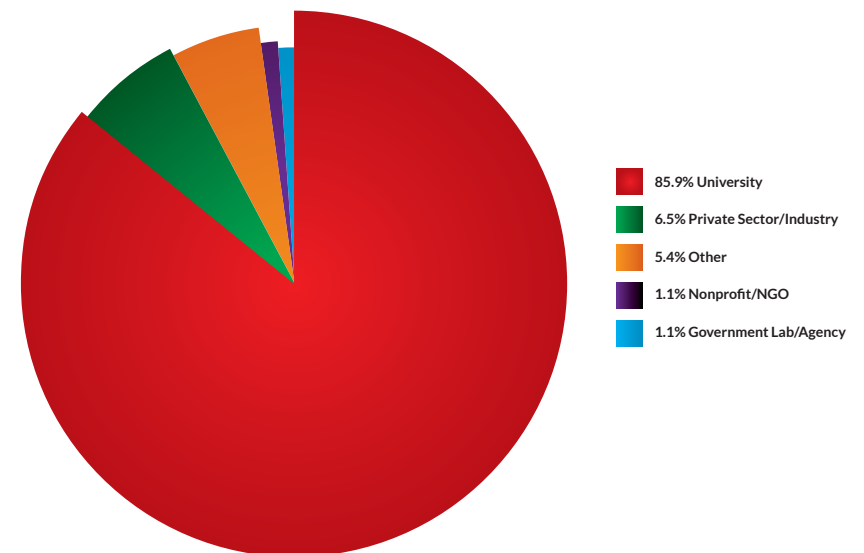
Our participants represent an extraordinary spectrum of BME work, from spine biomechanics to infectious disease, transportation safety to neuroengineering, biomaterials to brain injury treatments.

This diversity reflects what BMES Member Michelle Oyen, Ph.D., who studies pregnancy and women's health as an associate professor of BME at Wayne State University, describes as the field's core strength: "Engineering is creative problem solving, and that can apply to any field."

The professionals represent every stage of the BME innovation journey.



The professionals work across the full BME ecosystem.



The foundation of innovation: BME's reliance on federal support

Key finding: Nearly 3 out of 4 respondents have received federal funding.

WHY INDUSTRY CAN'T FILL THE GAP

The dependence on federal funding to support BME innovations makes sense when Dooley explained the limitations of private sector research: "Industry can't always afford to do the research. A lot of the research that's basic research being done at universities doesn't pan out. It's a high-risk, high-reward situation. Being at a publicly traded company, we can't have too much risk in our portfolio."

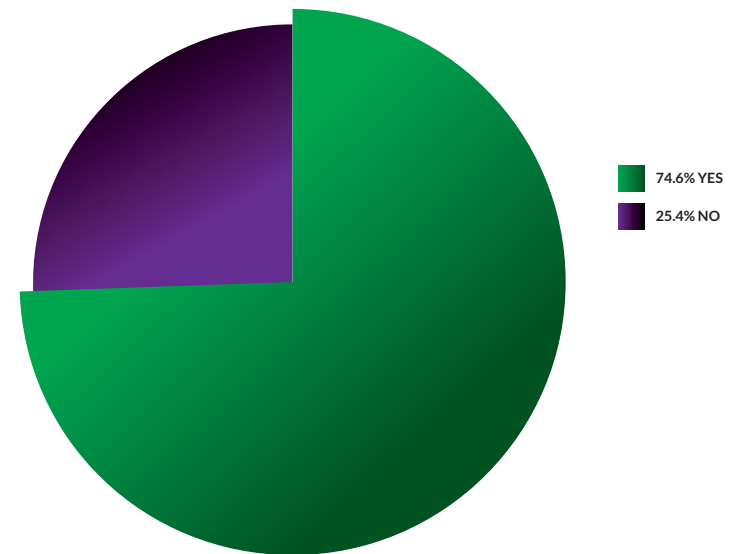
This creates what is described as the innovation pipeline: Universities conduct high-risk foundational research with federal support, while industry develops proven concepts into products.

As fellow industry practitioner Walt Baxter, Ph.D., BMES Fellow and distinguished scientist at Medtronic in cardiac rhythm management, said, "The lines between decisions made by our lawmakers, our elected representatives and biomedical engineers working in the medical device industry are direct, important."

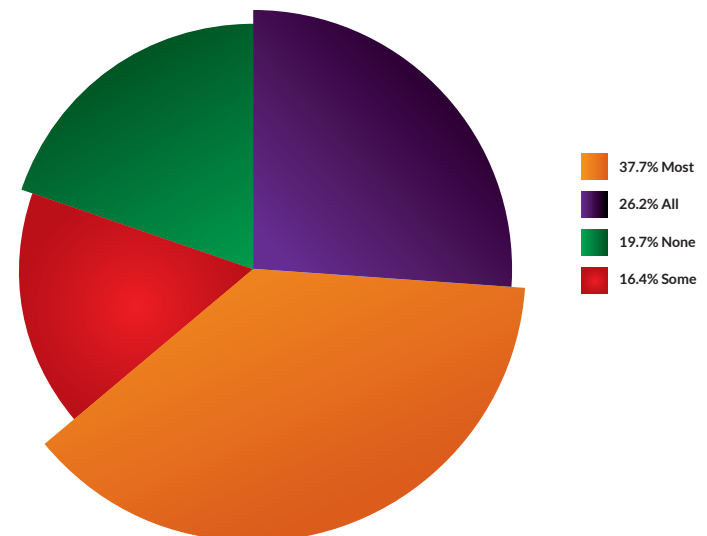
A PERSONAL CONNECTION TO FEDERAL FUNDING

"I was a beneficiary of funding from the National Institutes of Health. Federal funding kept my educational program going."
— Walt Baxter, Ph.D., BMES Fellow and distinguished scientist at Medtronic in cardiac rhythm management

Survey question: "Have you received federal funding for BME research within the last five years?"



Survey question: "How much of your current research is supported by federal funding sources?"



Survey finding: Pipeline pressures are widespread

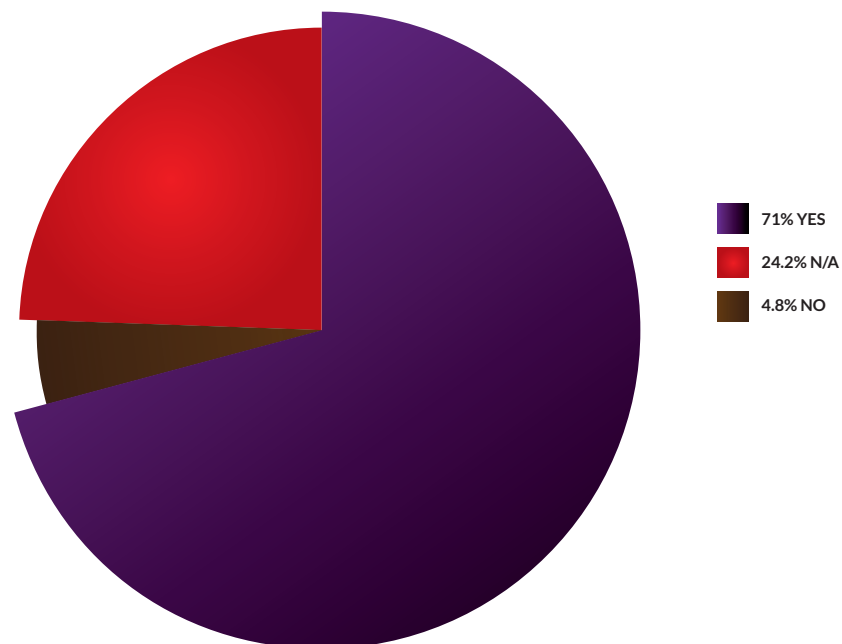
THE INNOVATION PIPELINE EFFECTS

Funding uncertainty creates consequences that extend far beyond current projects. Sakiyama-Elbert explains what many survey respondents echoed: “I think it also makes people really risk-averse too. So, if you don’t know if you’re going to have money in six months, you’re not going to try the really risky experiment. You’re going to try the safer experiment that you know you’ll get data from in the next couple of months.”

This shift toward “safe” research threatens the breakthrough innovations that BME is known for. As Dooley warned, “If people aren’t trained to do research, biotech, pharma and medical device companies are going to have a shortage of qualified, knowledgeable candidates to hire from. This is something we won’t feel until 5 or 10 years down the road.”

The workforce development concerns raised in our interviews are reflected across the field. AIMBE data shows 45% of departments plan to enroll fewer first-year graduate students in Fall 2025, with some reducing enrollment by up to 50%. The pipeline to progress depends not just on current innovators, but also on training the next generation of breakthrough developers.

Survey question: “Have you experienced challenges securing or maintaining federal research funding this year?”



FIELD-WIDE CONFIRMATION

These findings align with broader research in the field. A July 2025 AIMBE survey of 55 BME departments found that 71% had experienced grant terminations since January 2025, with 82% of private institutions and 64% of public institutions affected.

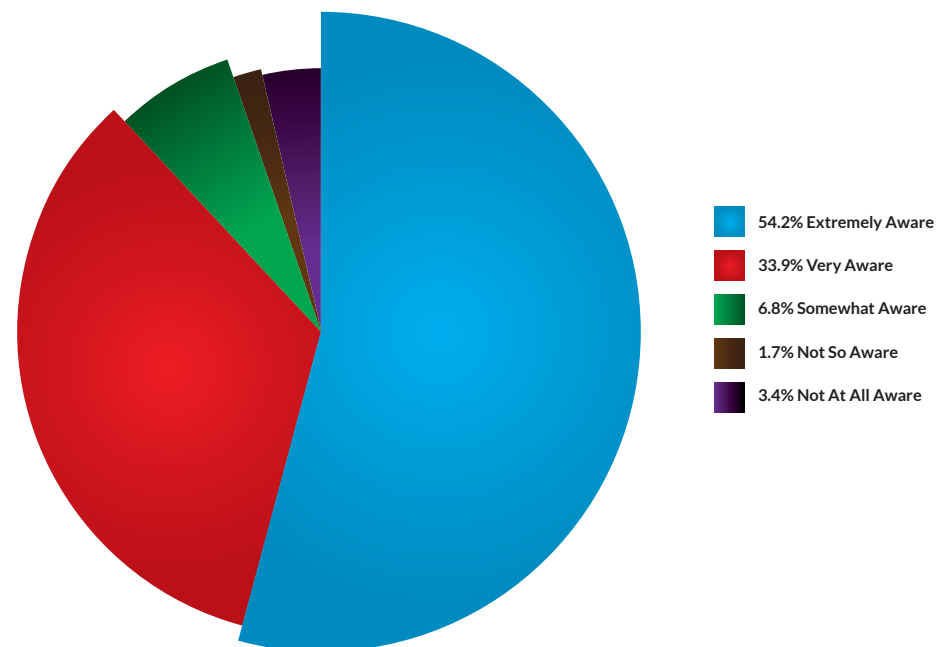
The institutional data confirms what individual professionals reported: Pipeline pressures are creating systemic challenges across the entire BME ecosystem.

The BME community understands both the challenges and the solutions needed to keep the pipeline to progress flowing.

REAL STORIES BEHIND THE NUMBERS

“We’ve definitely had some NIH grants that were terminated. We’ve had a lot of grants that are delayed either in the review process or just sort of in limbo as new levels of review were added or policies were changed after grants were submitted or even funded. I think that it is really challenging for folks to plan and to sustain their research.”
— 2025 BMES President Shelly Sakiyama-Elbert, Ph.D.

Survey question: “How aware are you of recent or proposed federal budget cuts affecting BME-related research?”



Survey finding: Ready to secure the future

RESPONDENTS CHAMPION THE PIPELINE

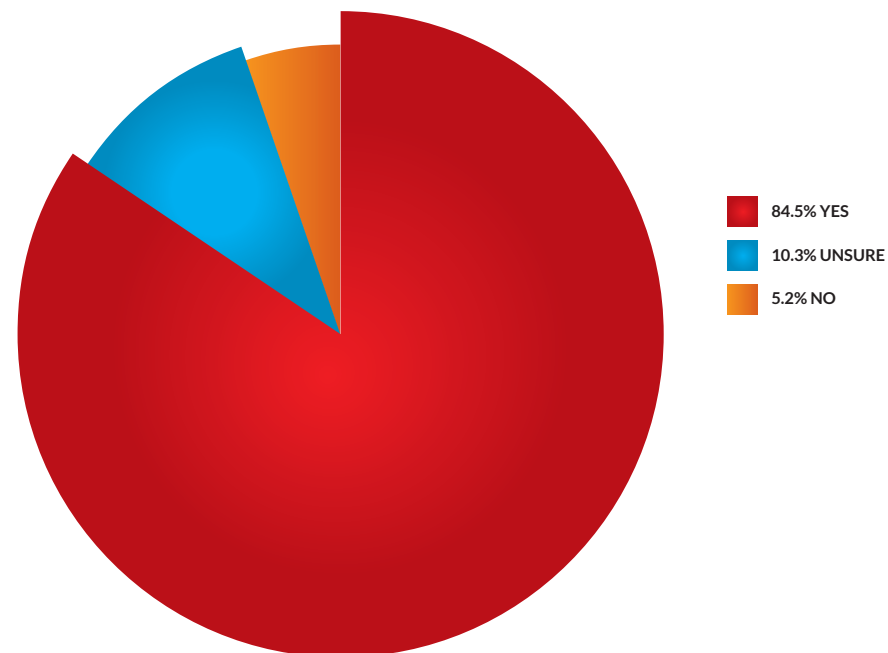
The BME community is ready to move from behind-the-scenes innovation to demonstrating its impact. Baxter challenges traditional approaches: “It is our responsibility to raise our hand and make that connection explicit. When I get a chance to partner up with BMES’ sister society, AIMBE, and talk with elected representatives, I try to do that. It’s been very rewarding, always educational in both directions.”

THE POWER OF PERSONAL STORIES

Survey respondents ready to share testimonials include professionals like Tamara Baynham, Ph.D., BMES Fellow. “We have interesting stories that we get to hear over the years, with doctors coming and telling us different great cases like someone who had chronic pain that severely limited their activity level and is now back to mountain biking again nine months later,” said Baynham, who is the founder and principal consultant for Ingenuity Medical Device Research.

These stories represent the human impact of a thriving pipeline to progress — breakthrough innovations that transform lives flowing from sustained research investment.

Survey question: “Would you be willing to support advocacy efforts to restore or increase federal funding for BME research?”



MOVING FORWARD TOGETHER

The survey respondents who are willing to mobilize represent a dramatic shift from BME's traditionally quiet approach. As Dr. Arlen Meyers, president and CEO of the Society of Physician Entrepreneurs, challenged, "If you don't like it, uncreate it. It's not good enough to put a hand up. You either have to suit up, show up or shut up."

The survey responses show BME professionals are ready to suit up and show up.



Survey insights: Protecting the pipeline

WHAT THE SURVEY REVEALS

Survey respondents painted a clear picture: The pipeline to progress depends heavily on federal support yet faces widespread pressures right now. Despite these difficulties, the community is highly engaged: 88% are extremely or very aware of policy impacts, and 84% are ready to mobilize for solutions.

This represents a challenge and an unprecedented opportunity. The same professionals who contribute to a field generating \$94.58 billion in economic activity, according to United for Medical Research's 2025 economic impact report, are ready to secure the pipeline that creates this impact.

THE STAKES: TOMORROW'S BREAKTHROUGHS

The policy decisions affecting BME funding directly impact life-changing innovations. Baxter described one example: "Parents of children with Type 1 Diabetes have gone from a place where they're checking their child's glucose levels five times a day — even throughout the night — because they're afraid that she's going to have a high or low event to a world where essentially a device is doing the work for you." This closed-loop insulin pump technology represents the kind of breakthrough that requires years of federally funded foundational research.

As Dooley warned, "That continuous march of progress of science and technology would stop" without sustained federal investment.



Our innovations touch millions of lives daily.

The survey responses provide compelling evidence: BME creates massive impact through innovations that touch millions of lives daily.

Numbers alone won't secure the pipeline. The real power is in the stories.

This is where you come in.

BMES vision: Health and wellness through engineering innovation

The next decade of patient care depends on decisions made today. As lawmakers better understand the full biomedical engineering ecosystem — research, development, manufacturing and delivery — funding flows to sustain America's innovation leadership.

BMES is working to elevate biomedical engineering's visibility and align with national priorities to build broader public support. Help us show lawmakers what's at stake by sharing breakthrough examples from your work.

The survey proved BME professionals are ready to step forward. Now, BMES is amplifying these stories to build broad public support for biomedical engineering.

When the pipeline to progress flows freely, innovation flourishes.

Share breakthrough examples of BME impact in everyday life

