U.S. Senator Maria Cantwell
Opening Statement at Senate Commerce Committee Hearing entitled, "Legislative Hearing on the Endless Frontier Act"
Witnesses: The Honorable Dr. Kelvin Droegemeier, Regents Professor, University of Oklahoma, and former Director, Office of Science and Technology Policy, and former Acting Director, National Science Foundation,
Dr. Marie Lynn Miranda, Provost, University of Notre Dame,
Dr. David Shaw, Provost and Executive Vice President, Mississippi State University,
Ms. Linden Rhoads, General Manager, The W Fund,
Dr. Gary Butler, CEO, Camgian,
Mr. Bill Bonvillian, Senior Director, MIT Office of Open Learning, Lecturer
April 14, 2021

Cantwell: Well good morning everyone. Today we have an exciting hearing, I believe, on the future of America's competitiveness when it comes to research and development. And how we move forward on research and development to tech transfer and the most successful strategies of that. We're honored to have a very distinguished panel in front of us and joining us virtually. The Honorable Kelvin Droegemeier, Regents Professor, University of Oklahoma, and former Director of the Office of Science and Technology Policy, and former Acting Director of NSF for Norman Oklahoma, welcome. Dr. Marie Lynn Miranda, Provost of the University of Notre Dame, thank you so much for joining us here and for your work on so many fronts, but particularly on lead and making our homes and children safer, we so appreciate that. Dr. Shaw, Provost and Executive Vice President Mississippi State University, welcome to you and thank you, we look forward to hearing your comments. We put the provosts in the middle, so okay, you can you can you can be global and specific at the same time, so we appreciate that. I think the provost are like the most important person on the university campus, everybody wants to get a message in to the provost, what are you going to focus on, so we appreciate it.

We're joined virtually by Linden Rhodes, General Manager of The W Fund, Seattle, and Linden, so appreciate you joining us today. I'm so excited for everyone to hear your testimony and the success that the University of Washington has done on tech transfer by being innovative over the last decade. We're joined by Dr. Gary Butler, Chief Executive Officer of Camgian in Starkville, Mississippi, and it's been great to have a few moments to hear about your success in the AI field and look forward to more comments. And Dr. Bill Bonvillian who is also joining us remote from MIT, the Office of Open Learning, Cambridge, Massachusetts and Senior Director. I'm sure he has a lot to say about this legislation that has been previewed a year ago, the Endless Frontier Act and I think is still being worked on by our colleagues. But nonetheless, is the stimulus for a very big debate about America's competitiveness as it relates to research and development, and as I said, commercialization and the tech transfer process. So no doubt, even without that it would be a good time to dust off this discussion, and clearly with our history as a committee on America COMPETES and COMPETES Act, we can see a little bit of retrospective of how well, or how well we didn't do, on authorizations and appropriations trying to do similar things, basically build the ecosystem that R&D and tech transfer is in the United States of America.

So today we're here to talk about America's competitiveness and that business competition. And as I mentioned, we have a talented list of witnesses here. We know that we, importantly, do federal funded research and between 1996 and 2015, federally funded research led to over 1 trillion in economic growth, and millions of new jobs. Now, I don't know if we're like a VC, you know, they're like 1 in 13 has to hit. No, but we know that federally funded research, when it comes to even the original R&D done,

that was then commercialized with Mozilla, out of the University of Illinois was a big enough success with the internet technology, by just some research on how to connect every computer with, you know hypertext links. Unbelievable, unleashing, so it shouldn't be lost on anyone that sometimes R&D, you just never know what the big breakthrough is going to be.

Today federal investment in research and development is at its lowest point in 45 years when measured against GDP. It has been essentially flat over the past two decades with adjustments for inflation and this comes as international competition is increasing, and other nations are ready to challenge our position on the world's innovation stage. So, since 2000 global R&D spending has risen more than 200%. To me, you have to take that into consideration with where we are. While the United States has certainly contributed to that growth. we only spend about 2.8% of GDP on research and development, less than some of the big economies, like Germany, Japan and South Korea. So, Congress has looked at this issue before, as I mentioned the COMPETES Act of 2017 and 2010, we authorized $80 billion in spending across multiple science agencies. And while COMPETES was successful in launching various initiatives, I believe the Advanced Research Project, ARPA-E program which for me, being a member of the DOE committee and being the home to a very prominent PNNL National Laboratory, I can tell you those monies went to good use, and helped us in growing very important, what I would say, solutions to some of our thorniest problems, whether that's investments in battery technology, how to get intermittent power onto the grid, leadership and cybersecurity detection on so many nuclear weapons front, so, anyway, lots of great work being done there. Even today, NSF has not fully achieved that funding level, though, that we imagined in America COMPETES so Senator Wicker and other members of the committee, I think one of the fundamental questions for us is what our committee can do to bolster the confidence of our appropriation allies that these are the right levels of investment and should be adhered to. And so, I hope that we can do that.

So I know that many of the witnesses today Mr. Droegemeier, Mr. Bonvillian, will point these important issues out. But, I really love the underlying theme in a lot of the testimony in front of us, both about decentralization and how universities play such a key role in, I think, a distributed network of R&D that already exists in the United States and we should be playing off of that. But also, Mr. Droegemeier and Dr. Miranda, you know, the need for collaboration and the ways to build better aspects of collaboration within these communities and these frameworks because as one noted author said, “collaboration is the next phase of innovation.” You can have all the innovation in an information age and all the information, but if you don't collaborate it to get it implemented, then you're not going to innovate. So, I hope that we can keep moving forward. We know that women and minorities are underrepresented in this area, Dr. Miranda will help address this today, that we need to do more in STEM. In 2019 women made up 48% of workers, but only 27% of STEM workers. And, as noted, COVID made that challenging, because many of these women were also the caregivers in their families. So how can you be a caregiver and a researcher at the same time? Very complicated. And one research paper said that women’s research has fallen 19% during the pandemic, so we know that we've been very affected by this.

So, I want to point out that, you know, Washington, Seattle, is probably one of the leading innovation centers in the United States, but I also think that they are becoming students of innovation itself. That is, I think there is an NSF grant the University of Washington is looking at at some of the successes Rose-Hulman has made in what I would call “fee-for-service innovation,” that they have figured out how to create an engineering and customer-based service-oriented success. And, as we're going to hear from the University of Washington today, how you take an already very plump research budget and get more out of it by changing the tech transfer system that we have at universities. So, a lot to digest today on

this front. And so I look very much forward to hearing the discussion from our witnesses and from our colleagues today.

I just want to point out, there are a few things that I do personally think that we need to be concerned about. We definitely need to make sure, doing the R&D without the STEM workforce will be a mistake. We need the workforce. The best research can't be implemented if we don't have the workforce and clearly, we're still at a shortage on the workforce. Second, I want to make sure that we continue to think of ourselves as a capitalist country, in how there's nothing better to put the right money on the right research than when capital is on the line. I can tell you this from aerospace and in other forms of computer science, as we compete against other nations. The fact that we have capital markets funding the investment creates a level of due diligence that gets us to success. So I'm not saying that any of this is a planned economy strategy, but to the degree that we veer off towards that, I'm going to bring us back to something that really capitalizes on America's capitalism because that has driven more success, and more innovation, I believe. So, thank you so much, and we'll look forward to hearing the witnesses. So with that, Ranking Member Wicker.