

Remarks of Dr. Brent Graveley

Commission on Economic Competitiveness and the Commerce Committee February 3, 2017

Good morning. My name is Brent Graveley. I am the John and Donna Krenicki Professor for Genomics and Personalized Health Care and the Associate Director of the Institute for Systems Genomics at UConn Health. I also serve as a member of the Advisory Council for the National Human Genome Research Institute, the branch of the NIH that is primarily charged with the funding of genomic research in the US. I therefore can speak to you from the point of view of a genomic researcher in Connecticut, and from the standpoint of someone intimately familiar with the funding interests of the NIH.

The annual NIH Budget is now in excess of \$30B. Although much of this is used to fund relatively small projects going on in independent laboratories, an increasing proportion of the budget is earmarked for specific areas of research including many large initiatives. These include the original Human Genome Project, but also more recent projects such as the 1000 Genomes Project, the Cancer Genome Atlas, the ENCODE project, The Microbiome project, the BRAIN initiative, the Centers for Common Disease Genomics, The Centers for Mendelian Genomics, and more recently the Cancer Moonshot and The Precision Medicine Initiatives. Each of these projects has committed very large sums of money to fund a relatively small number of groups. For example, rather than funding independent laboratories with grants of \$250K per year, these initiatives might distribute \$100M of funding to 10 groups. Of particular note for this meeting, the Precision Medicine Initiative received \$200M of funding in FY2016 and \$300M in FY2017 – a total of \$500M over two years.

If we in Connecticut are able to set the stage for our researchers here to successfully compete for such awards, we will be able to reap huge economic returns for our state.

Over the past decade, I have participated in one of these large projects called the Encyclopedia for DNA Elements, or the ENCODE project. This project is a follow up to the Human Genome Project and the goal is to be able to interpret the genome. This is critical for the success of Precision Medicine and Personalized Medicine as it provides the fundamental information required to interpret the genome sequences of patients. This enables physicians to precisely develop treatments tailored to each individual. My experience in these projects, as well as my tenure as a member of the National Human Genome Research Advisory Committee, has given me insight on what it takes to be competitive for such awards – expertise, teamwork, and infrastructure.

Connecticut has the expertise. Each of the institutions represented today – Yale, JAX, and UConn – have participated in some of the projects I have mentioned. However, I am not aware of any case where all the participants in one of these large grants have been from Connecticut institutions. I believe that a collaboration among these three Connecticut institutions, supported by the proper infrastructure, would be incredibly competitive for

this federal funding; our close proximity to one another facilitates teamwork, and our expertise taken together is both deep and broad in scope. It is critical, however, that we discuss the infrastructure needs required to be competitive for this funding. Most large genome sequencing grants have been awarded to states that have genome centers. For Connecticut to be competitive for these awards, including the genome sequencing phase of the federal Precision Medicine Initiative it will be necessary to increase the DNA sequencing capacity in the state.

Finally, I would like to point out that a 2012 report on the economic impact of the Human Genome Project concluded that every \$1 invested by the U.S. government generated \$141 in economic activity. Thus, investment by the State of Connecticut in the programs we are discussing today will almost certainly yield a large return on investment.

The state has already made key investments to make Connecticut a hub for bioscience and genomics. Facilitating partnerships among UConn, JAX and Yale, and potentially public-private partnerships, would leverage those state investments to position Connecticut as a strong competitor for large federal awards in Precision Medicine.