American Veterinary Medical Association

Association of American Veterinary Medical Colleges

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December 8, 2011

Mr. Ted Wackler
Deputy Chief of Staff
Office of Science and Technology Policy
via E-mail only to: bioeconomy@ostp.gov

RE: REQUEST FOR INFORMATION: BUILDING A 21ST CENTURY BIOECONOMY

Dear Mr. Wackler:

As the national veterinary professional association representing more than 83% of US veterinarians, and the nation's sole representative for veterinary medical colleges, departments of comparative medicine, and departments of veterinary sciences, the American Veterinary Medical Association (AVMA) and Association of American Veterinary Medical Colleges (AAVMC), respectively, write this letter to provide the Office of Science and Technology Policy (OSTP) with our input regarding development of a National Bioeconomy Blueprint.

We, the AVMA, which represents all aspects of the veterinary medical profession, including biomedical and comparative medical research; private and corporate practice; and academic, industrial, governmental, military, and public health services; and the AAVMC member institutions, with specific expertise and engagement in comparative medicine, offer the following comments as responses to many of the questions posed in the Request for Information referenced above:

- Identify one or more grand challenges for the bioeconomy in areas such as health, energy, the environment, and agriculture, and suggest concrete steps that would need to be taken by the Federal government, companies, non-profit organizations, foundations, and other stakeholders to achieve this goal.
  - Development and implementation of improved and rapid diagnostic, therapeutic, and prevention (e.g., vaccination) strategies for animal diseases, and in particular zoonotic diseases and diseases with the potential to negatively impact food security, that will limit their economic impact, prevent their spread from animals to animals and between animals and humans, and protect against their recurrence.

- Constrained Federal budgets require a focus on high-impact research and innovation opportunities. With this in mind, what should be the Federal funding priorities in research, technologies, and infrastructure to provide the foundation for the bioeconomy?
  - Application of functional genomic, transcriptomics, and proteomics systems biology and analyses of infectious, parasitic, and metabolic diseases of livestock species to develop predictive biology approaches for discovery of the next generation of diagnostics, vaccines, and pharmaceuticals.
  - Technological and personnel approaches to improve food safety and science-based risk analysis.
  - Development of multipathogen and multimodality multiplex handheld diagnostics for use in major livestock species, including systems to detect emerging infectious and parasitic pathogens and developing antimicrobial resistance.
  - Increasing the understanding of potential impacts of climate change on animals and ecosystem health

  - Development of a scientific knowledge base regarding judicious therapeutic antimicrobial use, to include enhanced risk-analyses processes to determine actual risks of antimicrobial resistance resulting from use of antimicrobials in animal agriculture.
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  - Development of practical processes to safely filter, inactivate, or degrade pharmaceuticals and personal care products present in the nation's waters, as well as prevent entrance of such substances into the nation's waters.
  - Development of innovative and efficacious animal waste management systems and procedures to improve environmental quality.
  - Strong coordination and collaboration among all tiers of public health, agriculture, and animal management agencies to address climate change issues.
  - Development and validation of appropriate animal models to facilitate federal regulatory approval of medical devices, therapeutics, diagnostics and vaccines for animal and human diseases

- The speed of DNA sequencing has outstripped advances in the ability to extract information from genomes given the large number of genes of unknown function in genomes; as many as 70% of genes in a genome have poorly or unknown functions. All areas of scientific inquiry that utilize genome information could benefit from advances in this area. What new multidisciplinary funding efforts could revolutionize predictions of protein function for genes?
  - Increased utilization of spontaneous diseases in domestic animals (e.g., dogs, cats) as models of human diseases.

- What are the barriers preventing biological research discoveries from moving from the lab to commercial markets? What specific steps can Federal agencies take to address these shortcomings? Please specify whether these changes apply to academic labs, government labs, or both.
  - Premature emphasis on the commercial potential of basic research activities places unnecessary costs on researchers and research institutes. It would be far more prudent to put effort into commercialization only after sufficient progress has been made on a research project to warrant potential commercialization.
  - Commercial markets are increasingly demanding that products be developed for zero risk. However, few—if any—products, processes, or activities carry zero risk. A better understanding and acceptance of development for minimal or acceptable risk would help to remove this barrier and, potentially, result in development of increased number of efficacious and safe (but not zero risk) products.

- What specific changes to Federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs would help accelerate commercialization of federally-funded bioeconomy-related research?
  - Allow full-time academic employees to serve as principal investigators (or at least co-principal investigators) of SBIR and STTR projects.

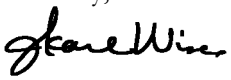
- The majority of doctorate recipients will accept jobs outside of academia. What modifications should be made to professional training programs to better prepare scientists and engineers for private-sector bioeconomy jobs?
  - The AVMA and AAVMC strongly support and affirm the recognition by the NIH of the role of veterinarians as scientists, educators, trainers, and collaborating partners in scientific research that takes a comparative, one-medicine approach to improvements in human and public health, as stated in the recent National Center for Research Resources (NCRR) 2009-2013 strategic plan (available at www.ncrr.nih.gov/strategic_plan/). Because contributions by veterinary basic scientists and clinical researchers will be critical for energizing the discipline of clinical and translational research across the country, the AVMA and AAVMC urge the continuation of

federal funding to support and expand opportunities for veterinary scientists and veterinary students to engage and participate in scientific education and training, research teams, and science policy and leadership roles, through the expansion of formalized training positions, broadening of debt-forgiveness clauses, and appointment on relevant federal agency committees and councils.

The AVMA and AAVMC also wish to use this opportunity to express our continued support for programs administered under the former National Center for Research Resources (NCRR) at the NIH, especially the Division of Comparative Medicine (DCM), which is now in the Office of the Director at the NIH. We define comparative medicine as a discipline in which the similarities and differences in biology among animals enhance the understanding of mechanisms of human and animal disease alike. In this way, biomedical research, clinical studies, and ultimately, therapy directed at experimentally induced and spontaneously occurring diseases in animals form the basis for animal models of human and animal disease. In other words, comparative medicine embodies translational medicine, and translational medicine— and, hence the DCM— will be a key component to implement and advance the National Bioeconomy Blueprint. Programs administered by the DCM provide research infrastructure and animal model support, as well as support for veterinarians in biomedical and public health research. The essential role of animal models and veterinary scientists should also not be underestimated in the formation and operation of the new NIH National Center for Advancing Translational Sciences, which will be essential to rapidly move basic research discoveries to benefit human and public health.

In closing, the AVMA and AAVMC believe the veterinary profession is uniquely positioned to be an active participant in both the process to develop a National Bioeconomy Blueprint and in its implementation. Veterinary medicine has the national responsibility to care for and protect animal health, and, in cooperation with other health and natural resources professions, to care for and protect public health, food systems, and environmental and ecosystem health. However, stewardship in these areas is challenged by new and re-emerging diseases that arise from characteristics particular to today's society, including globalization of commerce; commercialization and consolidation of food supplies; increasing transportation efficiencies; greater encroachments at animal-human-environmental interfaces; and the threat of bioterrorism. As such, traditional approaches will require innovative strategies and measures to successfully and effectively address these diverse risks into the future. The nation's veterinary profession, through the AVMA, and the nation's veterinary medical colleges, through the AAVMC, are eager to work with our colleagues in other disciplines and in both public and private sectors to meet these challenges head on through the development and implementation of a National Bioeconomy Blueprint. We thank the OSTP for this opportunity to provide comments. Should you have questions, please feel free to contact Dr. Elizabeth Sabin (esabin@avma.org; 800-248-2852, ext 6675) in the AVMA's Education and Research Division or Dr. Ted Mashima (tmashima@aavmc.org; 202-371-9195, ext 118) in the AAVMC's Academic and Research Affairs office.

Sincerely,



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