



# NIST BIOSCIENCE PROGRAMS

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In the ~ \$70M Bioscience programs, what are the 4-5 areas of most significant investment?  
How do you anticipate this may differ, or not, in 2020?

# TARGETED AREAS OF STRATEGIC IMPORTANCE FROM 2005-2015

## Omics Measurements

Develop the measurement capabilities to support growing needs in genomics, proteomics, metabolomics (health)



## Biomanufacturing

Develop measurement science, standards and technologies for biopharma industry focusing on protein therapies (health, manufacturing)

## Cell and System Analysis

New methods and technologies for probing cells and systems including tissue and organism level measurements (health)

Additional significant investments in:

- Environmental health and safety aspects of nanotechnology (Nano-EHS, initiative funds)
- Clinical standards (SRM-WCF funds)
- DNA forensics (OA funds)

# AREAS OF STRATEGIC IMPORTANCE (2015-2025)

## **Engineering biology**

Develop the measurements and models for engineering biology to map out the fundamental principles that drive development of next generation bio-based products (high tech manufacturing, health)

## **Microbial Measurements**

Develop measurement infrastructure for microbial measurements (health, environment)

## **Data and Informatics**

Provide validated data and informatics tools to support confident decision-making (all sectors)

## **Quantitative Tools for Characterization of Complex Biologics**

Define complex biomolecules/biologics through quantitative measurements to enable prediction of biological function in healthcare applications (manufacturing, health)

## **Precision Medicine**

Develop measurement science and standards to ensure confidence in clinical decision-making, and ultimately enable adoption of precision medicine (health)

# MAPPING PAST AND FUTURE

-Omics (25%)

-Clinical standards (5%)



-Precision Medicine (20%)

-Microbial measurements (5%)

-Biomanufacturing (25%)



-Quantitative Tools for  
Characterization of Complex Biologics  
(25%)

-Cell and System Analysis  
(15%)



-Engineering Biology (15%)

-Forensic DNA – continue (5%)

-NanoEHS - decrease (5%)

-Data and informatics – increase (15%)

2M investment this year from MML discretionary funds



# KNOWLEDGE

There are 10 sites where NIST has partnerships with embedded staff; it would be helpful to better understand the range of partnership models and how these remote entities best partner with NIST headquarters.

# BIOSCIENCE PARTNERSHIPS

## Main Campuses



Gaithersburg, MD



Boulder, CO

## Strategically established partnerships



Inst. for Bioscience and Biotech. Research (IBBR)  
University of Maryland



Joint Initiative in Metrology for Biology (JIMB)  
Stanford Univ, CA

## Opportunistic partnerships



Hollings Marine Laboratory (HML)  
Charleston, SC

NIST researchers located on all sites and NIST on governing and science strategy boards; Remote sites engaged in meetings, and quarterly visits from Lab Office



Are staffing needs met successfully? How can NIST improve exposure, image, etc. to ensure policy makers are more aware of the success stories and at the same time improve visibility to potential staff candidates?