Overview of ORIP Shared Instrumentation Program

Monika Aggarwal, Ph.D.
Program Director, Instrumentation
Grant Program, ORIP, DPCPSI

National Institutes of Health

ORIP'S S10 PROGRAM OVERVIEW

NIH established Shared Instrumentation Grant (SIG) Program in 1982, initiating S10 mechanism to support the purchase of scientific instruments for shared use.

ORIP's S10 program supports acquisition of

- ✓ state-of-the-art,
- ✓ commercially available, and
- ✓ costly

scientific instruments

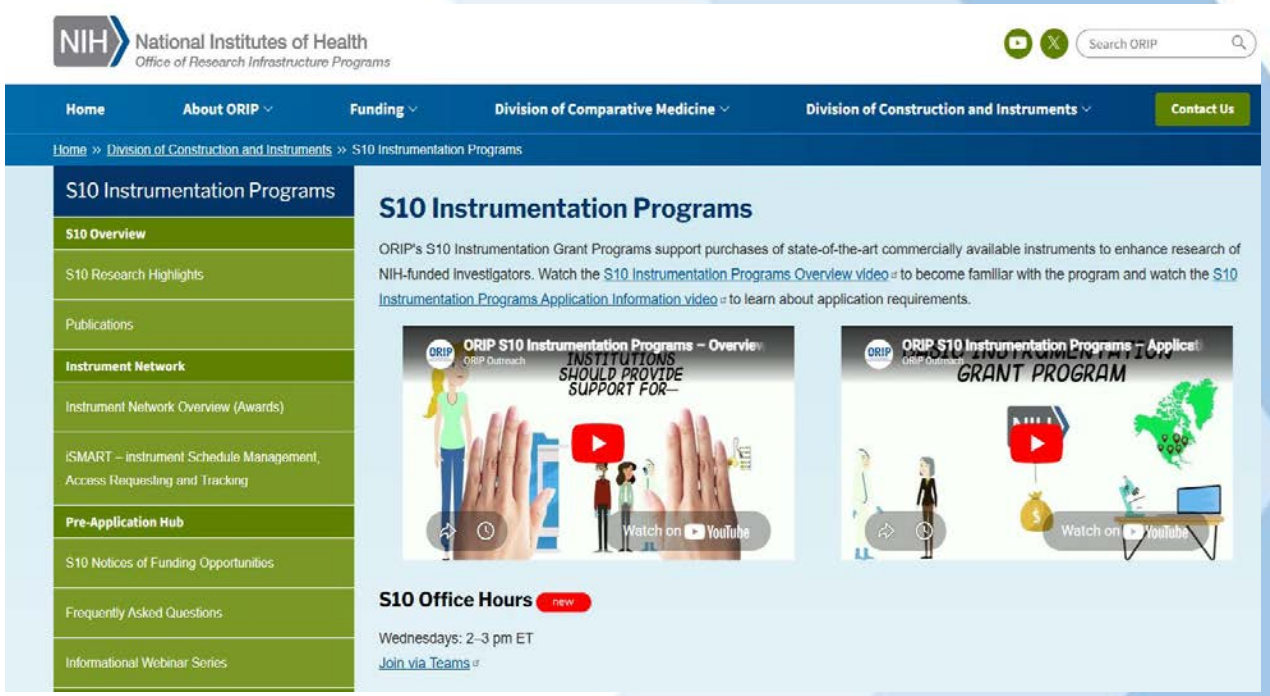
- ✓ to be used on a shared basis
- ✓ to enhance NIH-funded research.

Awards issued for one year to

- ✓ purchase,
- ✓ install the instrument, and
- ✓ make it available to the users.

NIH mandates institutional support and internal advisory committee's oversight.

ORIP manages S10 awards for 5 years

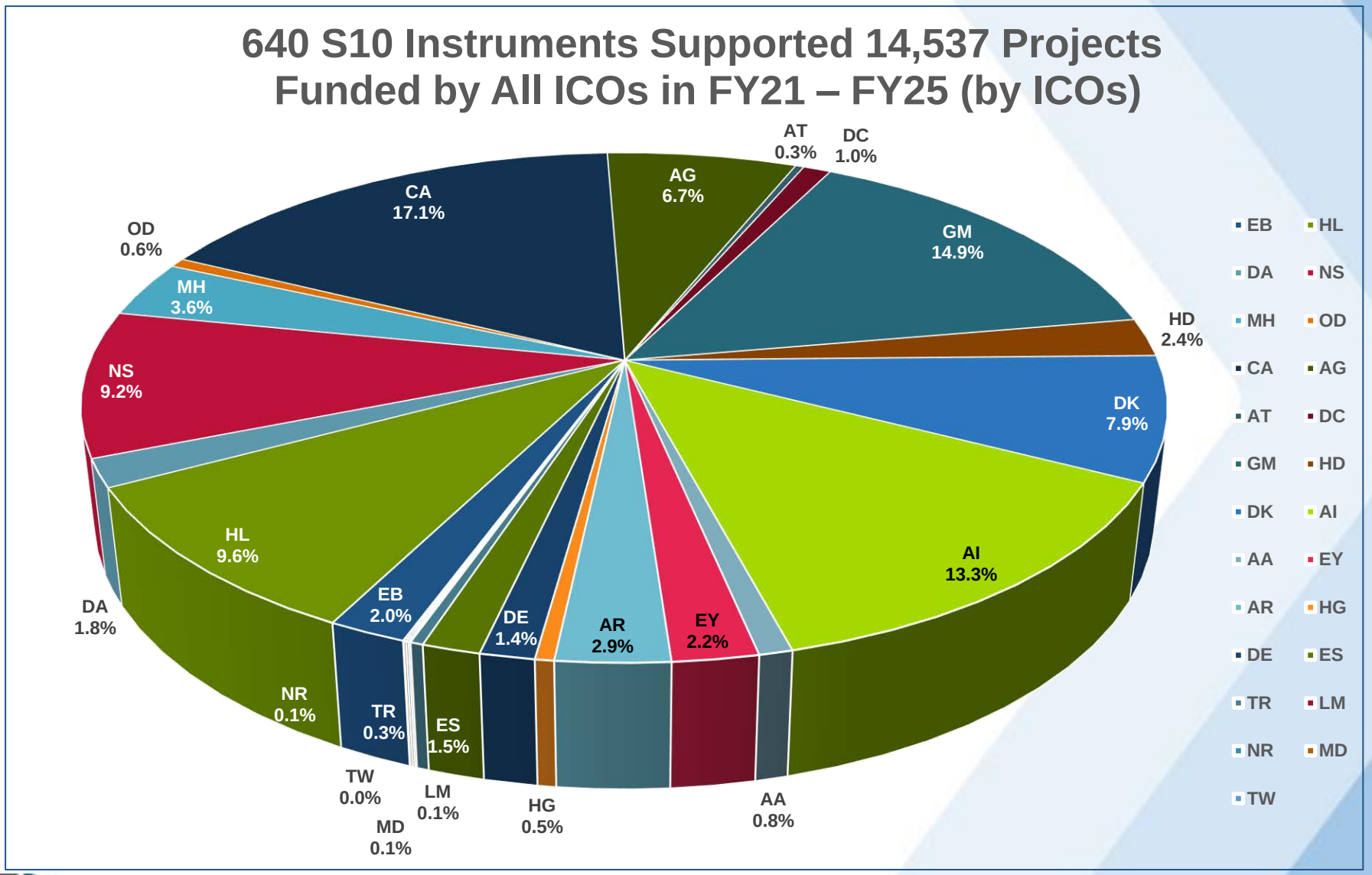


https://orip.nih.gov/division-construction-instruments/s10-instrumentation-programs

- **Each S10 awarded instrument supports 17 NIH funded research grants on average.**
- **Enable broad research for tens of thousands of investigators in hundreds of institutions nationwide.**
- **Generating data for thousands of publications each year.**

National Institutes of Health

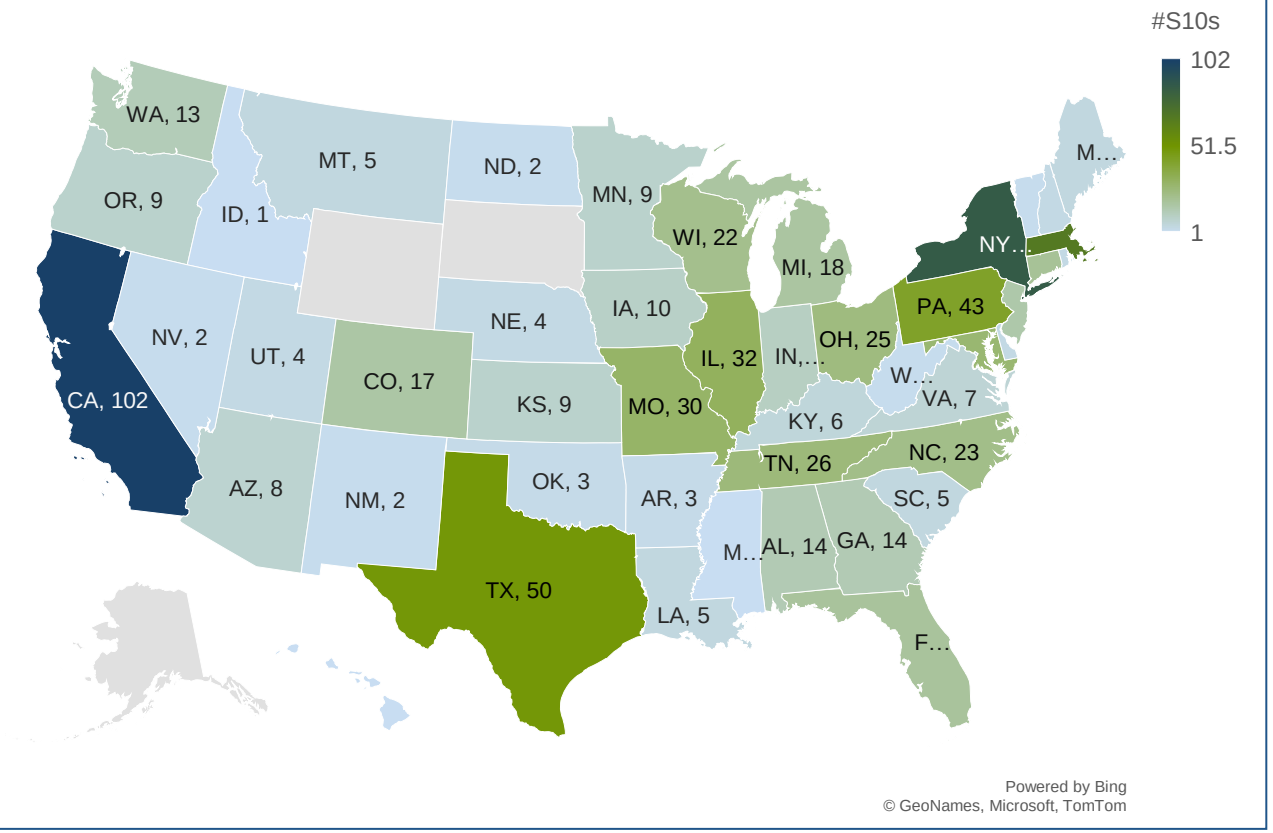
S10 BENEFITS ALL NIH ICOS



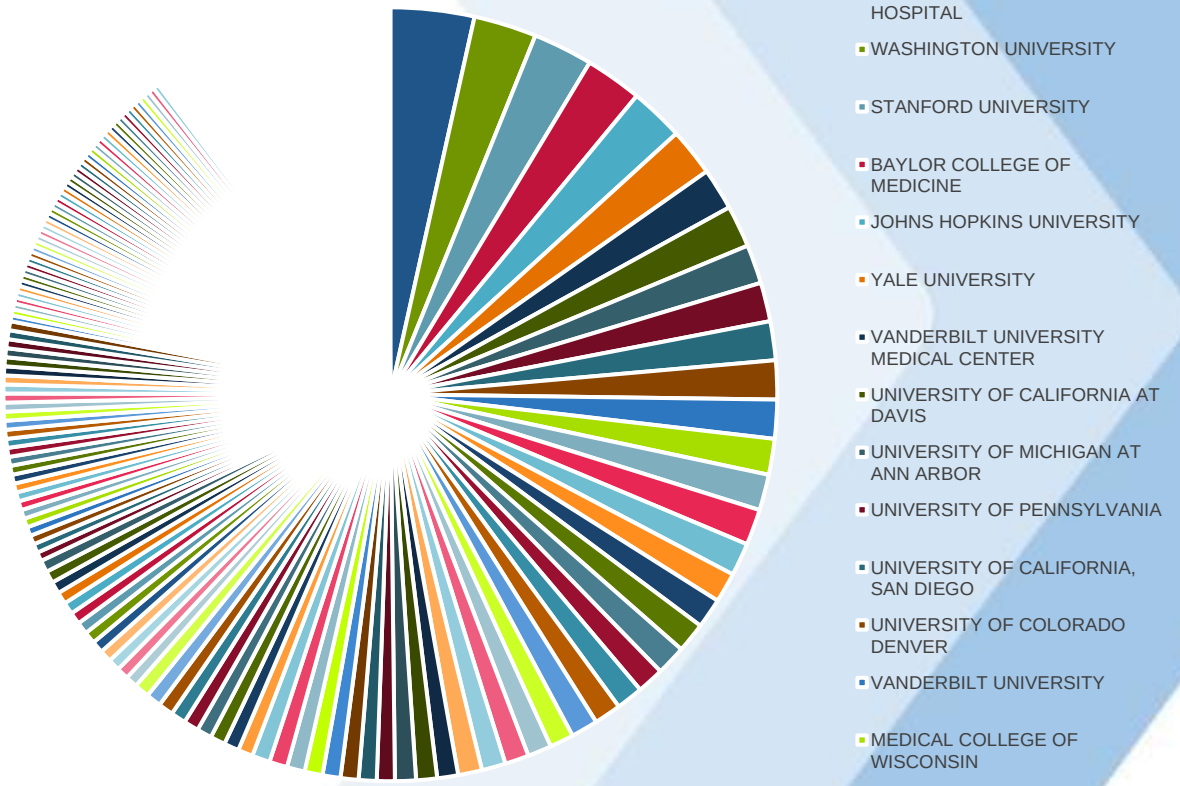
National Institutes of Health

S10 GEOGRAPHIC DISTRIBUTION

Active S10 Grants Awarded to 49 States*



S10 Awarded 200+ Institutions in FY 2021 – FY 2025



S10 instruments supported nearly all States.

*** 49 states include Washington DC and Puerto Rico. Data from 2025.**

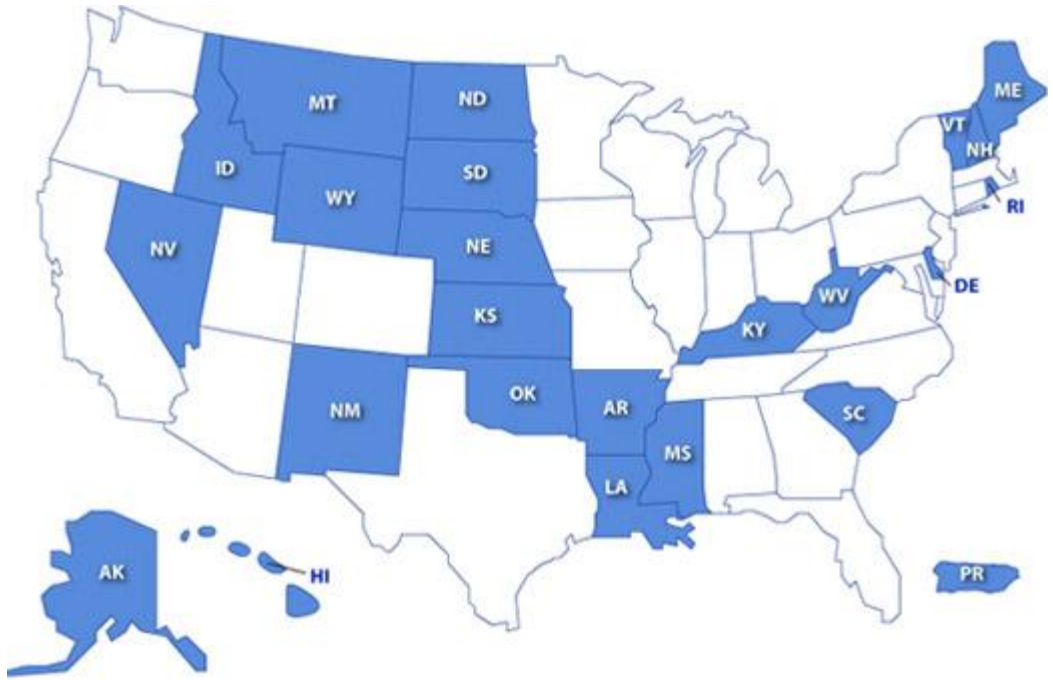
National Institutes of Health

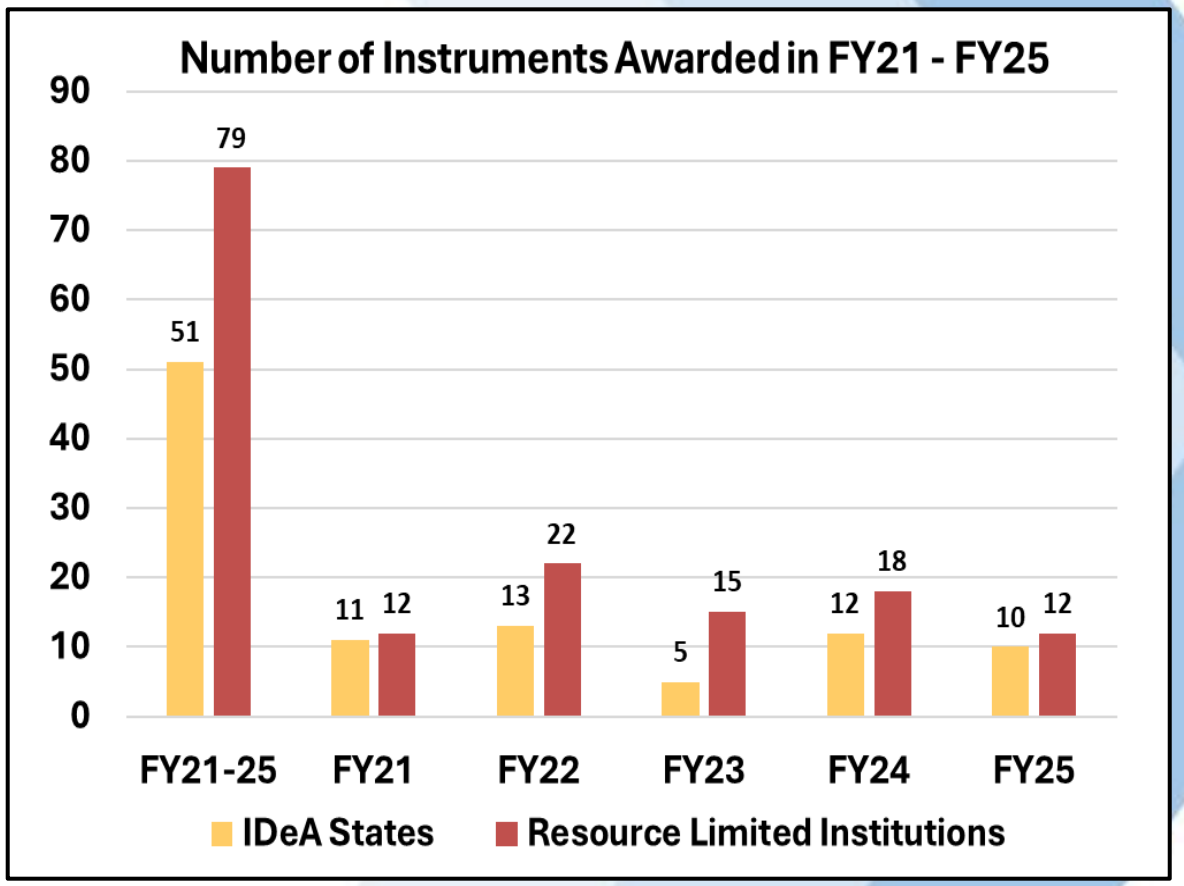
DISTRIBUTION OF FY 2025 S10 AWARDS



S10 BENEFITS UNDER RESOURCED INSTITUTIONS

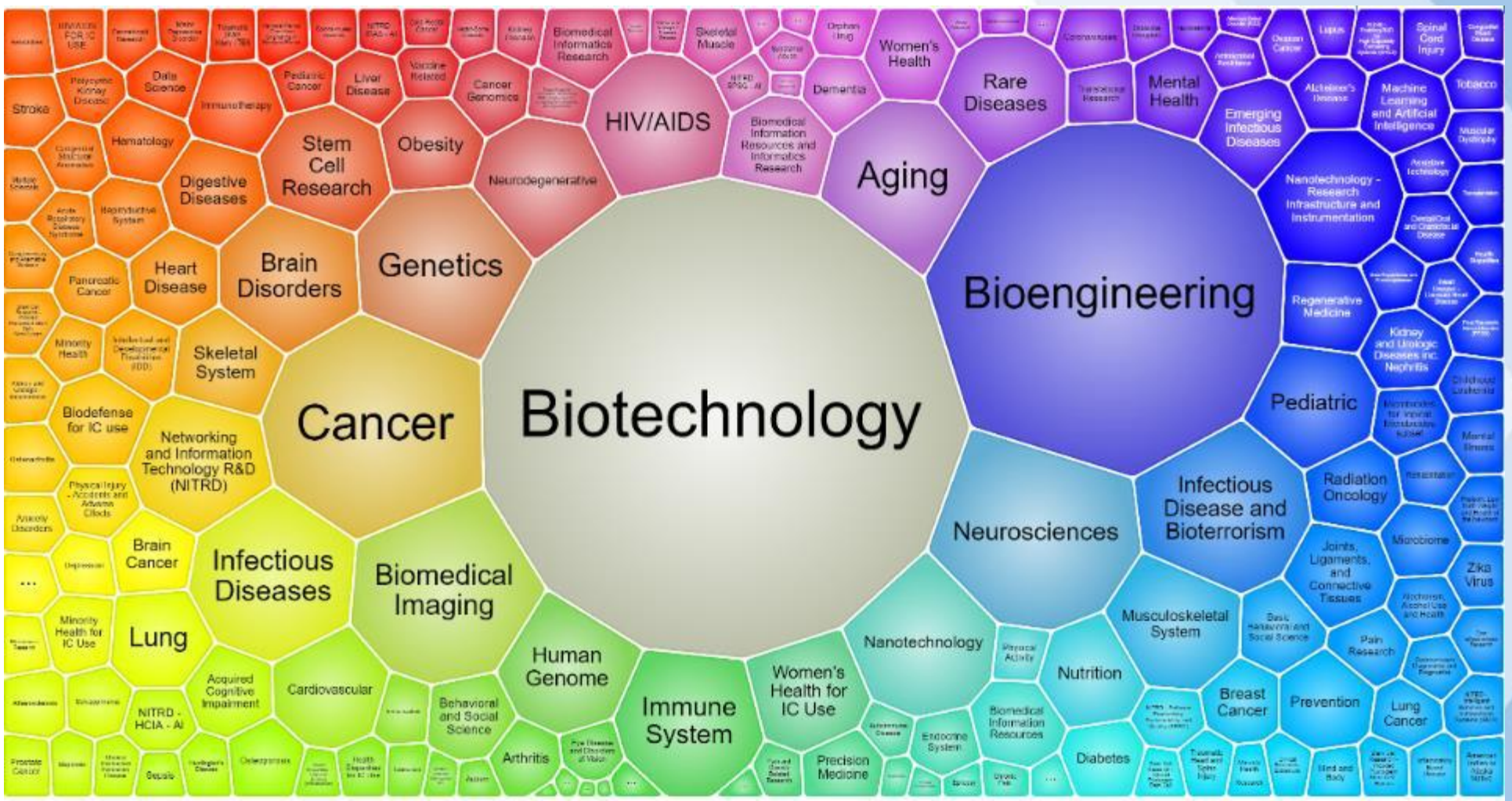
Institutional Development Award (IDeA) States





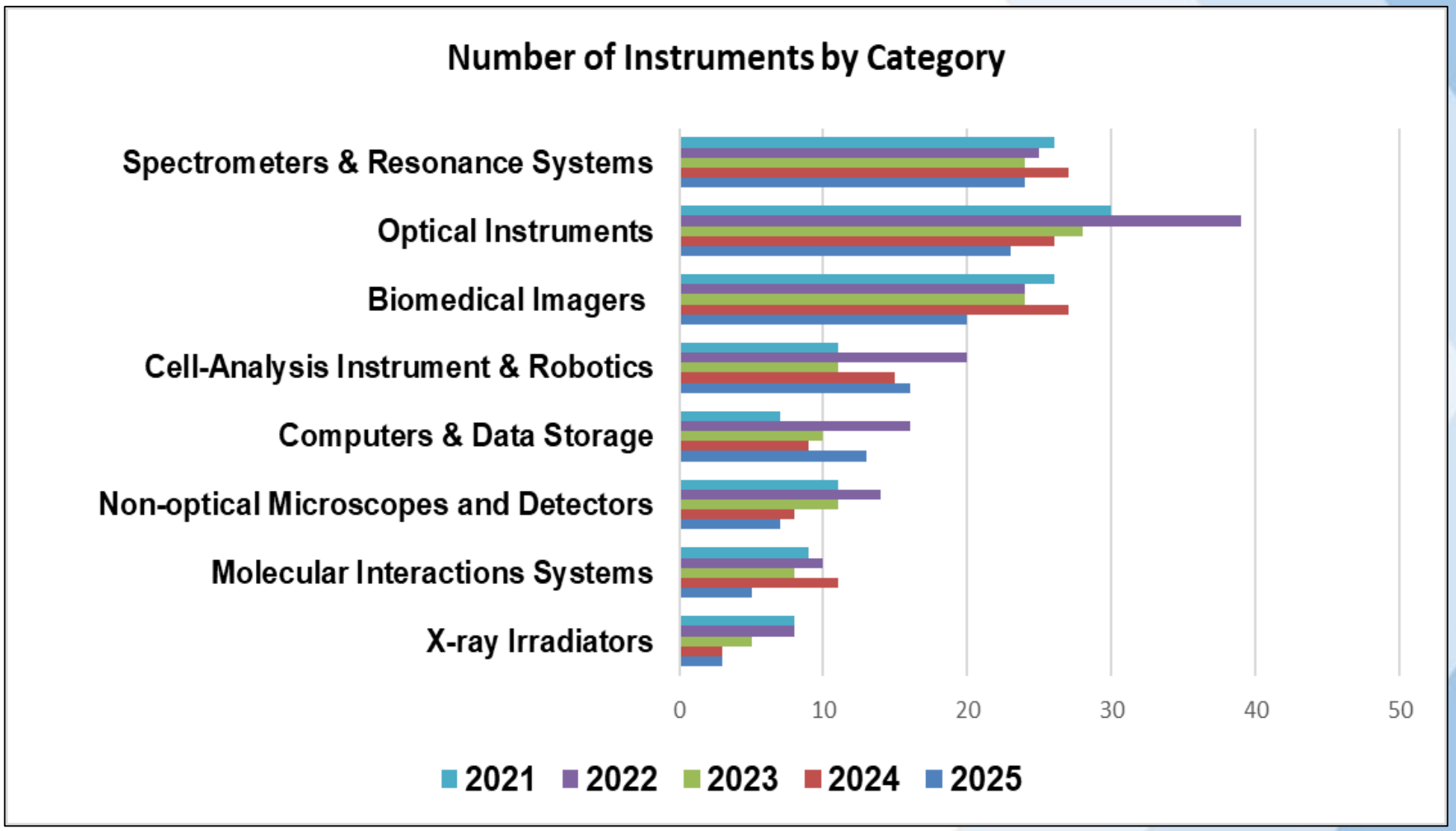
National Institutes of Health

PROGRAM IMPACT ON SCIENTIFIC FIELDS

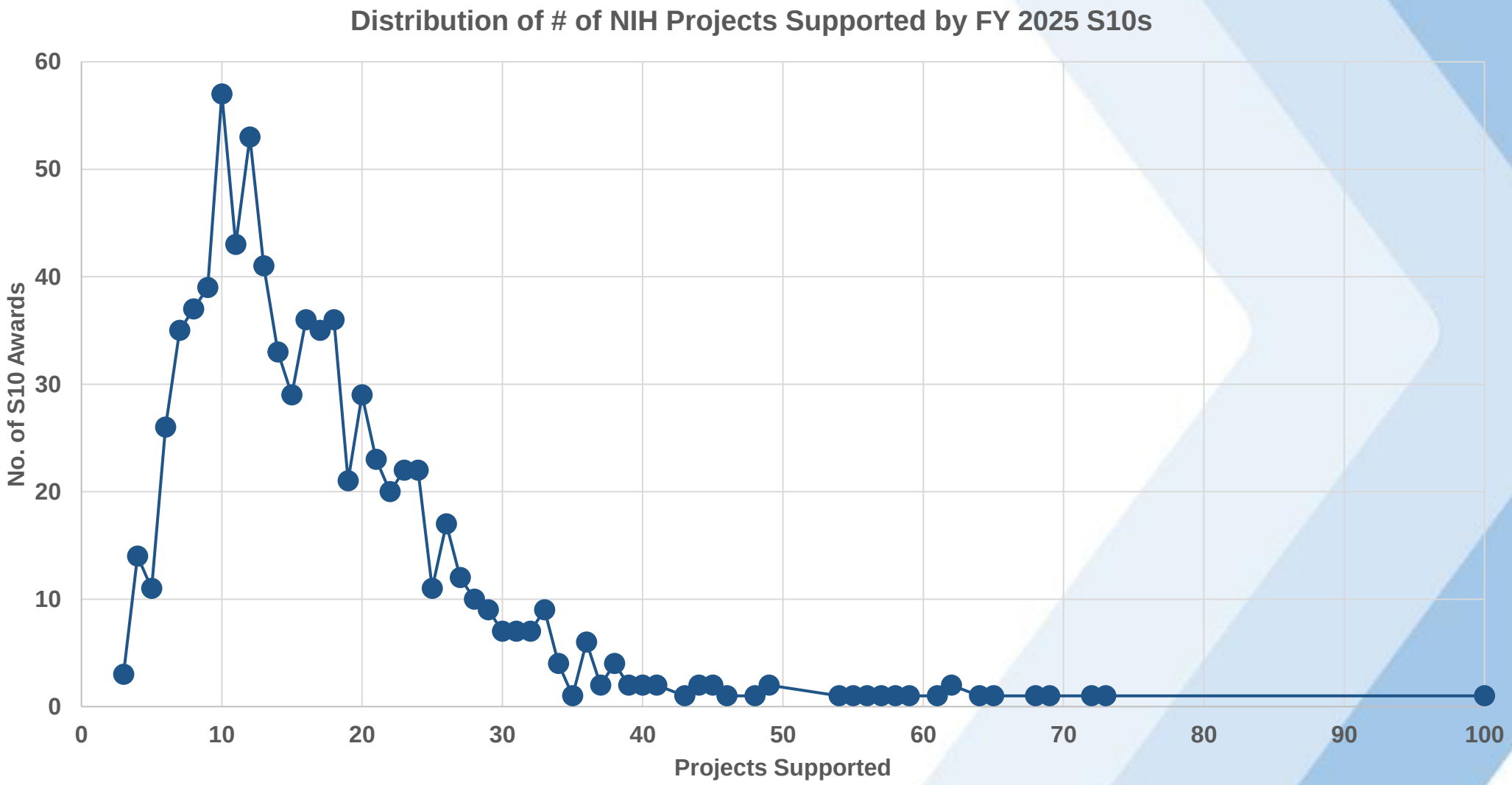


Scientific areas supported by S10 awards

S10 SUPPORTS ALL TYPES OF INSTRUMENTS

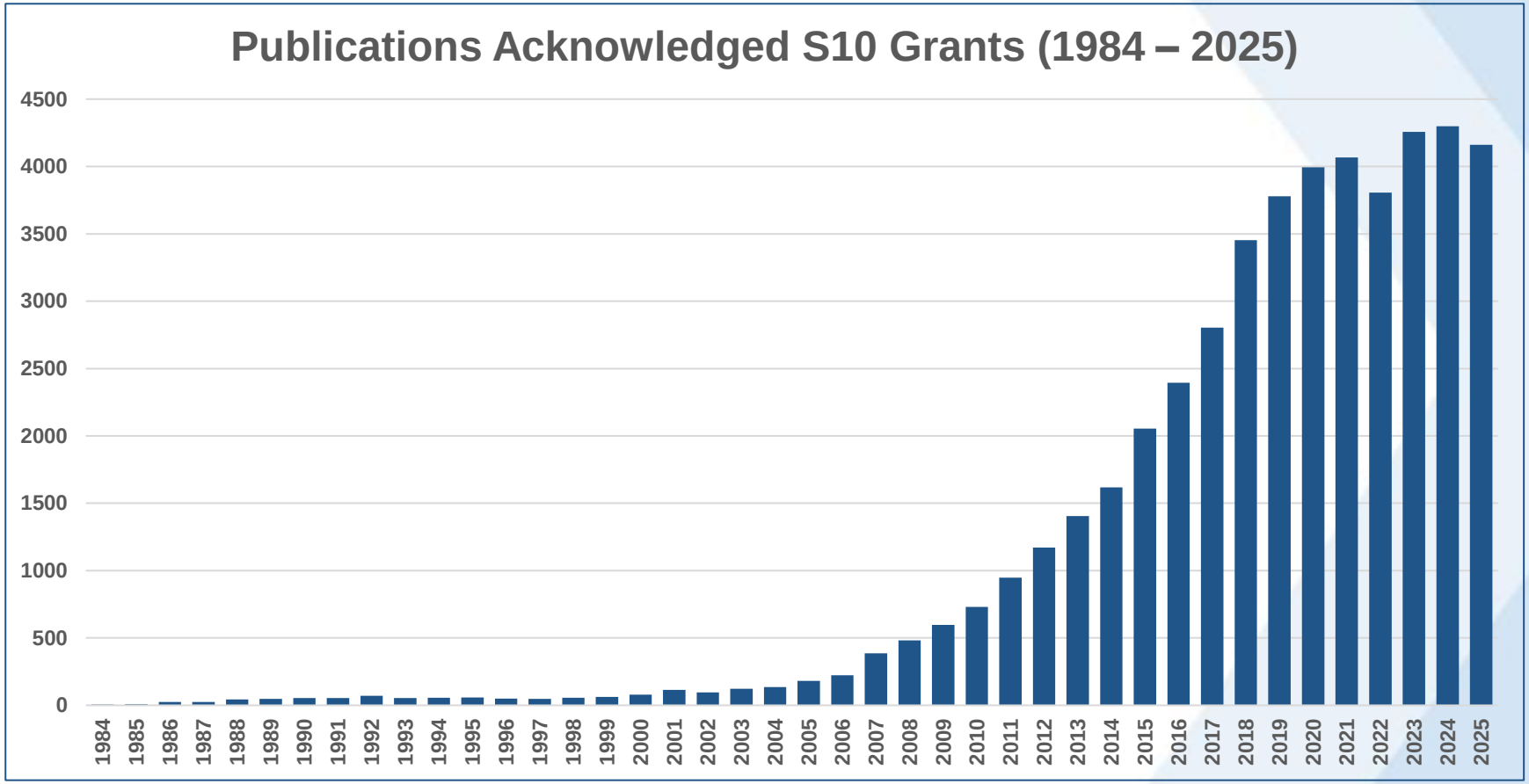


NO. OF NIH GRANTS SUPPORTED BY EACH S10 (FY25)

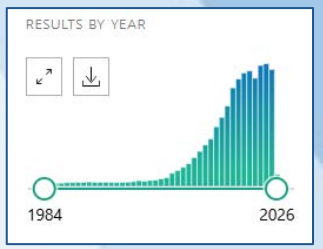


National Institutes of Health

ORIP S10 ENABLES 4,000 PAPERS EACH YEAR



PubMed Data (02/10/2026)

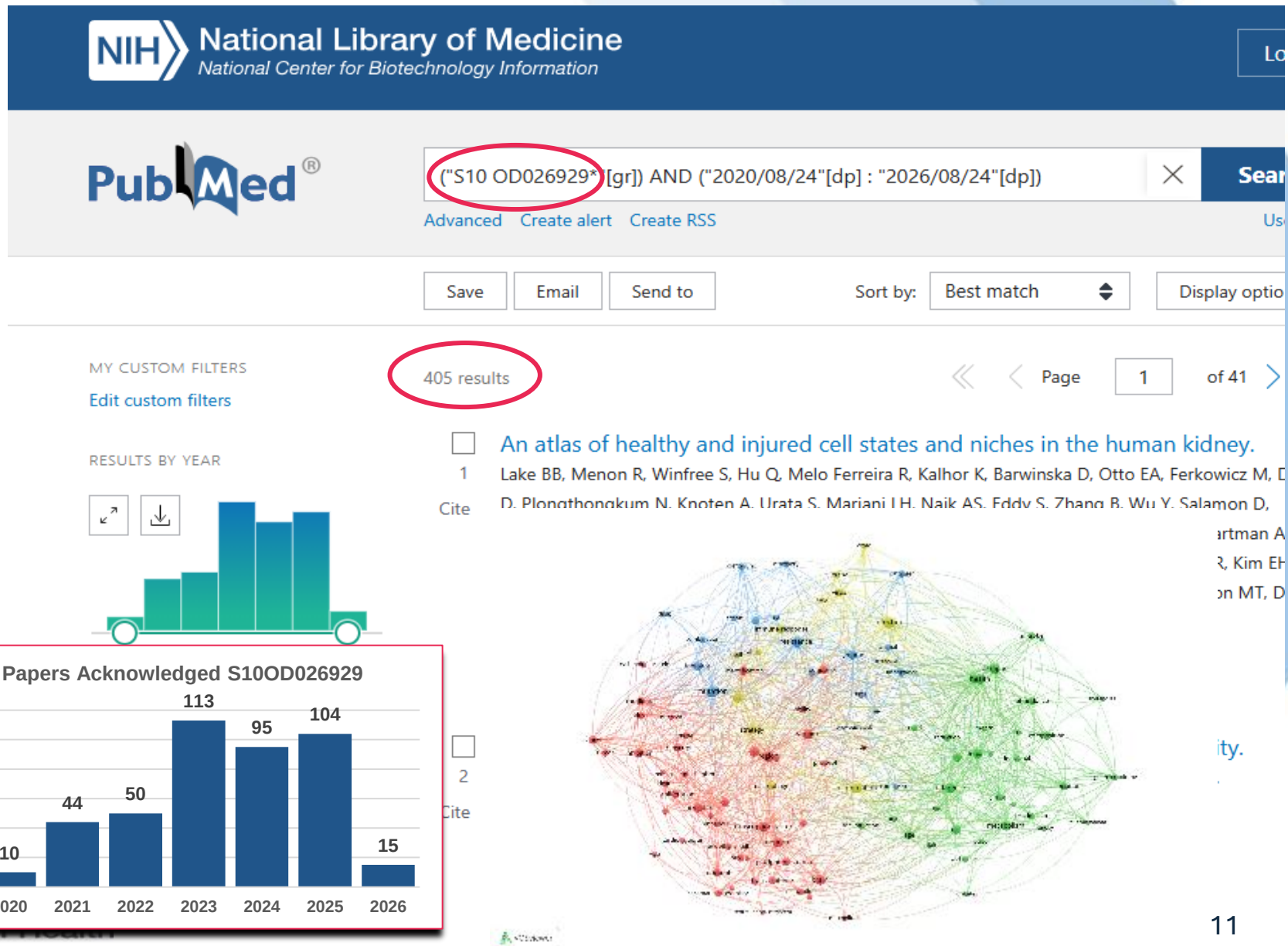


National Institutes of Health

S10 SUPERSTAR IN PUBLICATIONS

1S10OD026929-01
PI: Kristen Jepsen
University of California, San Diego
Illumina NovaSeq 6000 Sequencing System





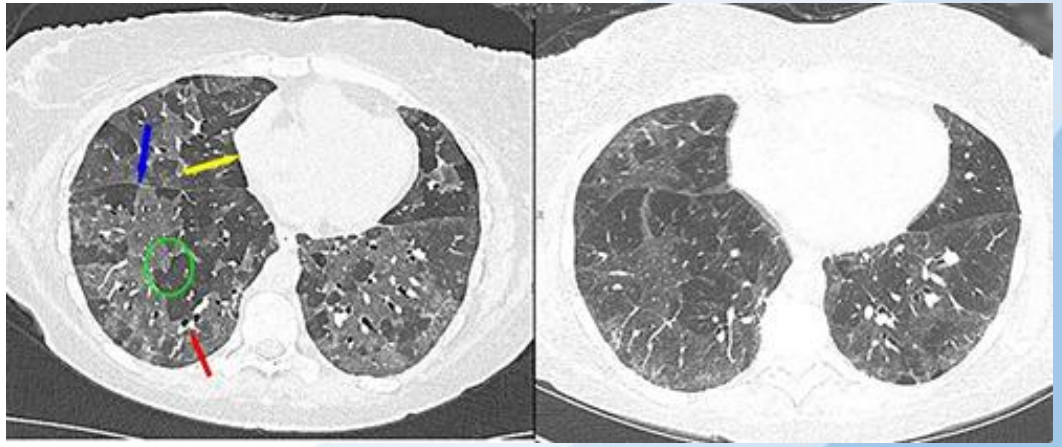
S10 HIGHLIGHT – ADVANCED CT IMAGING FOR EARLY DETECTION OF LUNG DISEASES

Seeing the Invisible: Detecting Early Lung Diseases with Advanced Computed Tomographic Imaging

- Combine high-resolution imaging with quantitative analysis, allowing precise measurement of lung structure and function.
- Assess localized airflow, ventilation, and tissue mechanics, providing deeper insight into how lung diseases develop and progress.
- Advanced CT imaging techniques can detect early, subtle lung abnormalities that are not visible with conventional scans, enabling earlier diagnosis of diseases like COPD.
- The story highlights the value of S10 program in supporting specialized research infrastructure, advancing personalized medicine and improving patient outcomes.



Left: Dr. Eric A. Hoffman (sitting) and Dr. Jessica C. Sieren, Advanced Pulmonary Physiomic Imaging Laboratory. Photo courtesy of Dr. Eric A. Hoffman.

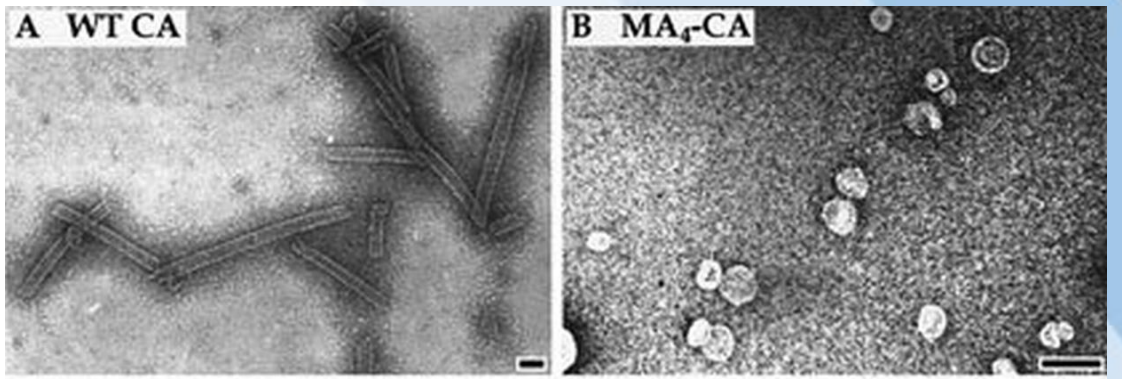


Below: CT images and image assessment. Photo courtesy of Drs. Rodrigo Moreira Bello and John Newell, Department of Radiology, The University of Iowa Carver College of Medicine.

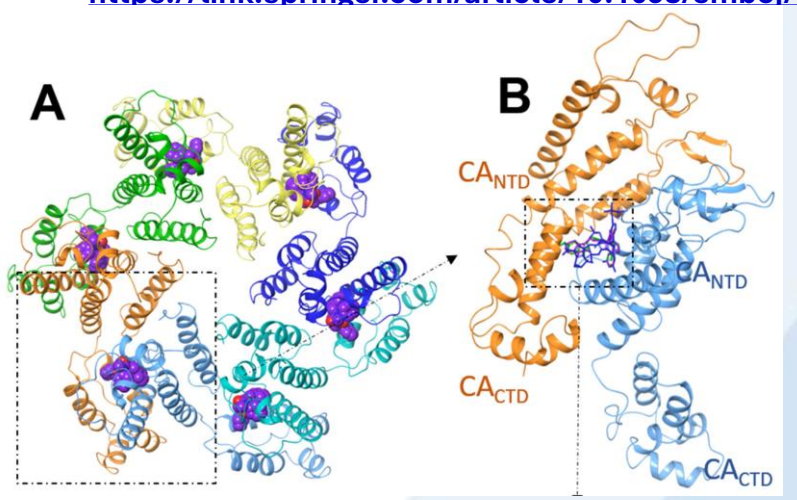
S10 HIGHLIGHT – S10 SUPPORTED ALL PHASES OF LENACAPAVIR DEVELOPMENT

Decades of ORIP Support Contributed to Lenacapavir Development:

- **As early as 1998, S10 funded electron microscopes helped study HIV viral core assembly affects structure and identify capsid as a potential target for treatment.**
- **By 2011, S10-funded instruments were used to assess the structure of the capsid monomers, helped ultra-high resolution structural analysis, and how the capsid function is dynamically regulated.**
- **S10 instruments helped study the mechanisms of host–capsid recognition and interactions, capsid trafficking processes, and how capsid stability affects viral function and survival.**
- **S10-funded computer helped determine the molecular basis of Lenacapavir drug resistance.**
- **S10 instrument helped develop and validate methods for determining concentrations of Lenacapavir in human blood and tissue.**



Capsid cylinder-to-sphere transformation accompanies viral maturation
https://link.springer.com/article/10.1093/emboj/17.6.1555



Molecular structure of Capsid hexamer (A) and monomer interface (B)
https://www.mdpi.com/1999-4915/13/5/920



Structural analysis of Capsid
https://pubs.acs.org/doi/10.1021/jacs.6b08744

National Institutes of Health

ORIP STRATEGIC PLAN ON S10 PROGRAM

ORIP supports all scientific instruments and technologies that align with the NIH-Wide Strategic Plan and the NIH Director's initiative to prioritize human based science.

- **Strategy 2.1.1: Provide a wide range of advanced instruments that are essential for driving progress across all areas of biomedical research.**
- **Strategy 2.1.2: Respond to the evolving modern instrumentation demands of the scientific communities at academic and research institutions nationwide.**
- **Strategy 2.1.3: Facilitate the adoption of emerging commercially available instruments and novel technologies that accelerate technological innovations and scientific discovery.**

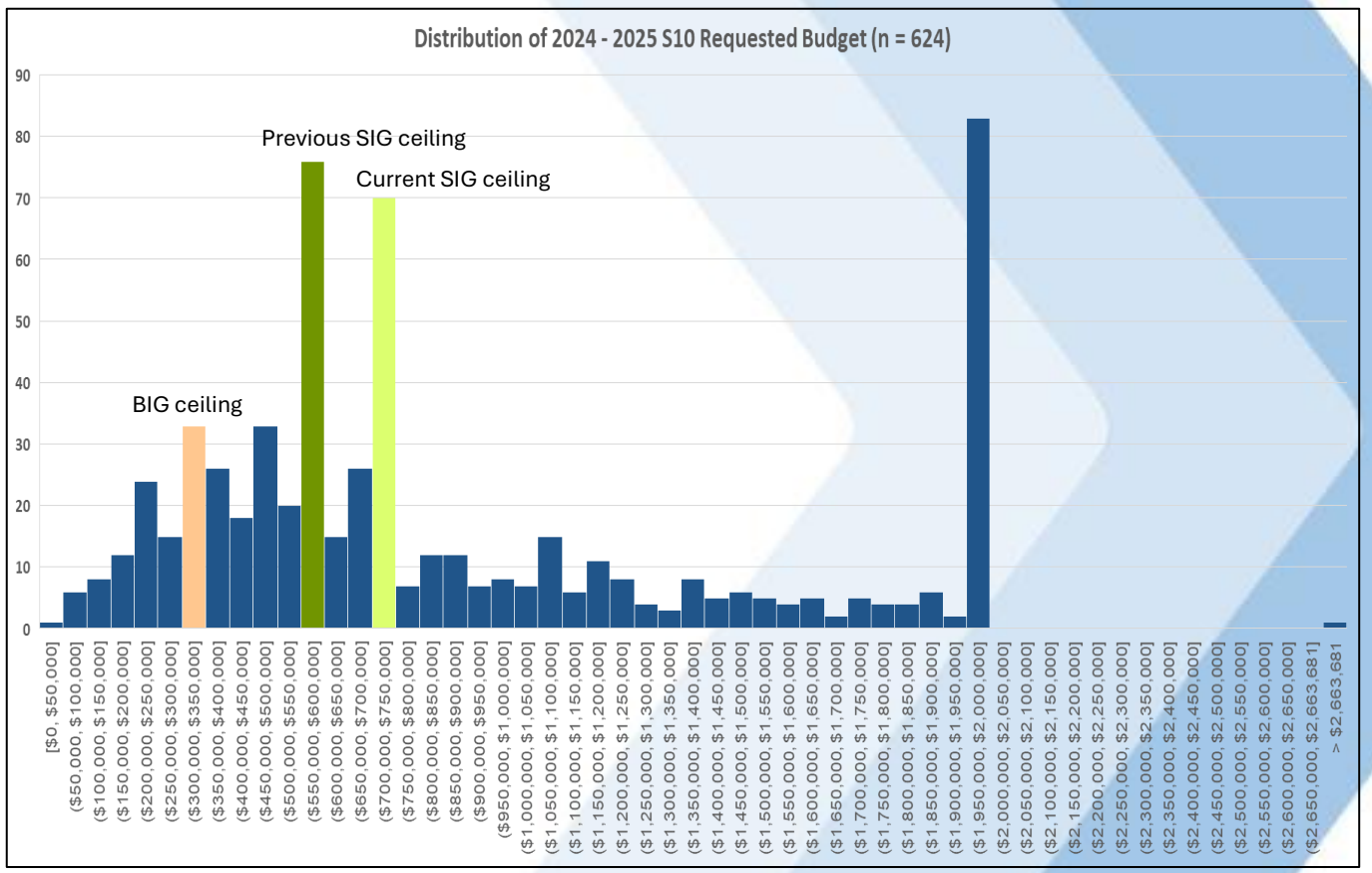


National Institutes of Health

PROPOSED PREMIUM S10 INSTRUMENTS

- **Premium instruments (>$2M) are expected to**
  - ✓ expand regional impact
  - ✓ fill gap in regional infrastructure
  - ✓ promote collaboration beyond applicant institution
  - ✓ support wider network of NIH-funded investigators

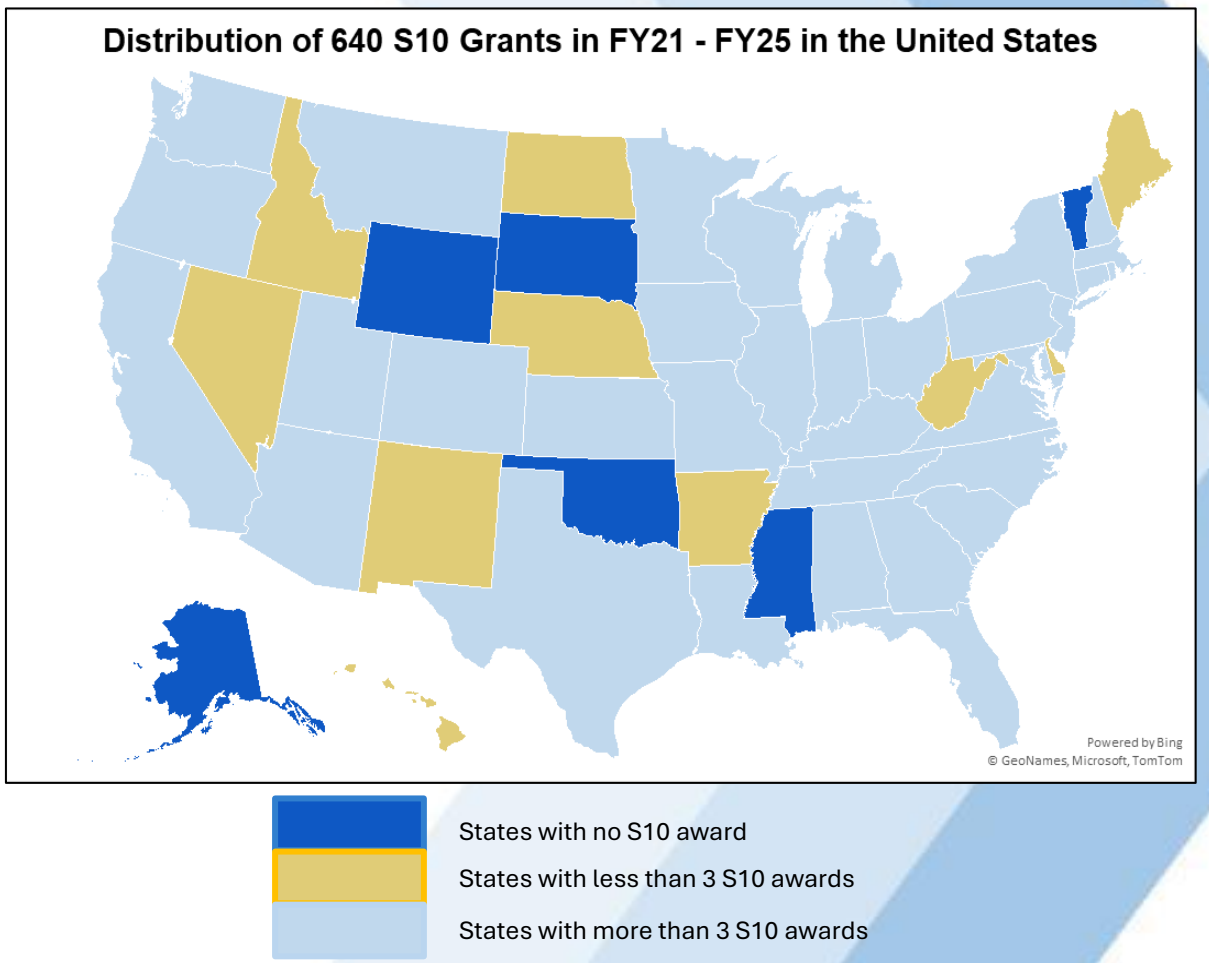
- **ORIP will seek collaborations with NIH ICO partners to co-fund premium instruments**



National Institutes of Health

PROPOSED SEED INSTRUMENT SUPPORT (SIS) PROGRAM

- The S10 SIS Program will promote innovative research activities by supporting instruments currently unavailable at the institution.
- The S10 SIS Program fosters new opportunities to grow into a sustainable research program at all institutions.
- The S10 SIS Program encourages collaborative research and helps develop technical expertise while supporting research capacity building.
- Price range is $50,000 - $400,000.



National Institutes of Health

Thank you for your attention!

Questions?