ORIP

Concept Clearance: Reissue (PAR-19-177, PAR-19-178, PAR-19-179)

Title: Shared Instrumentation Programs (Mechanism: S10)

Objective: To support acquisition of shared-use scientific instruments

Funds Available and Anticipated Number of Awards: Contingent upon NIH appropriations and the submission of meritorious applications

Award Project Period: One year

Council Action: Vote for continued support of the shared instrumentation program

BASICS

- NIH's Shared Instrumentation Program supports acquisition of
  - ✓state-of-the-art
  - ✓costly
  - ✓commercially available

scientific instruments that

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

BACKGROUND

- S10 funding mechanism
- ORIP is the only NIH unit supporting this program
- Awards issued for one year to
  - ✓ purchase
  - ✓ install and
  - ✓ make the instrument available to the users

EXAMPLES

Types of supported technologies include:

- X-ray diffraction systems
- Mass spectrometers
- Sequencers
- Biosensors
- Electron microscopes
- Light microscopes
- Cell sorters/analyzers
- Biomedical imagers

- and OTHERS

PROGRAM OUTCOMES

In FYs 2012 – 2018 the Shared Instrumentation Program

- Received about 400 applications per year
- Funded (cumulatively over 7 years) (about) 800 awards
  - ✓ **About 110 awards per year**
  - ✓ **Annual budget about $70M**
- To 181 unique academic and research institutions
- In 44 states and DC

PROGRAM OUTCOMES

- Meeting demands for different state-of-the-art technologies, by funding proportionally to requests for various types of instruments
- Benefiting research funded by all NIH ICs
- Enabling research of thousands of investigators in hundreds of academic & research institutions nationwide
- Generating data for thousands of high-profile publications

CONCEPT CLEARANCE

- Continue support for the Shared Instrumentation Program

Additional slides with background information and supporting data follow.

OUTLINE: BACKGROUND & IMPACT

- Funding Opportunity Announcements
  - ✓Applications, Awards, Success Rates
- Technology Requested
  - ✓Types of Requests & Award Distribution
- S10 Awards per US States
  - ✓IDeA States: Applications, Awards, Success Rates
- S10 Awards & NIH-funded Research
  - ✓NIH ICs, Number of Projects, Users
- Publications
- Impact: A Summary

S10 FUNDING OPPORTUNITIES

- To manage the S10 Program, ORIP issues 3 Funding Opportunities Announcements with one receipt date per year:

✓ **SIG - Shared Instrumentation Grant Program**
(latest now expired: PAR19-179)

✓ **SIFAR - Shared Instrumentation for Animal Research Grant Program**
(latest, now expired: PAR19-178)

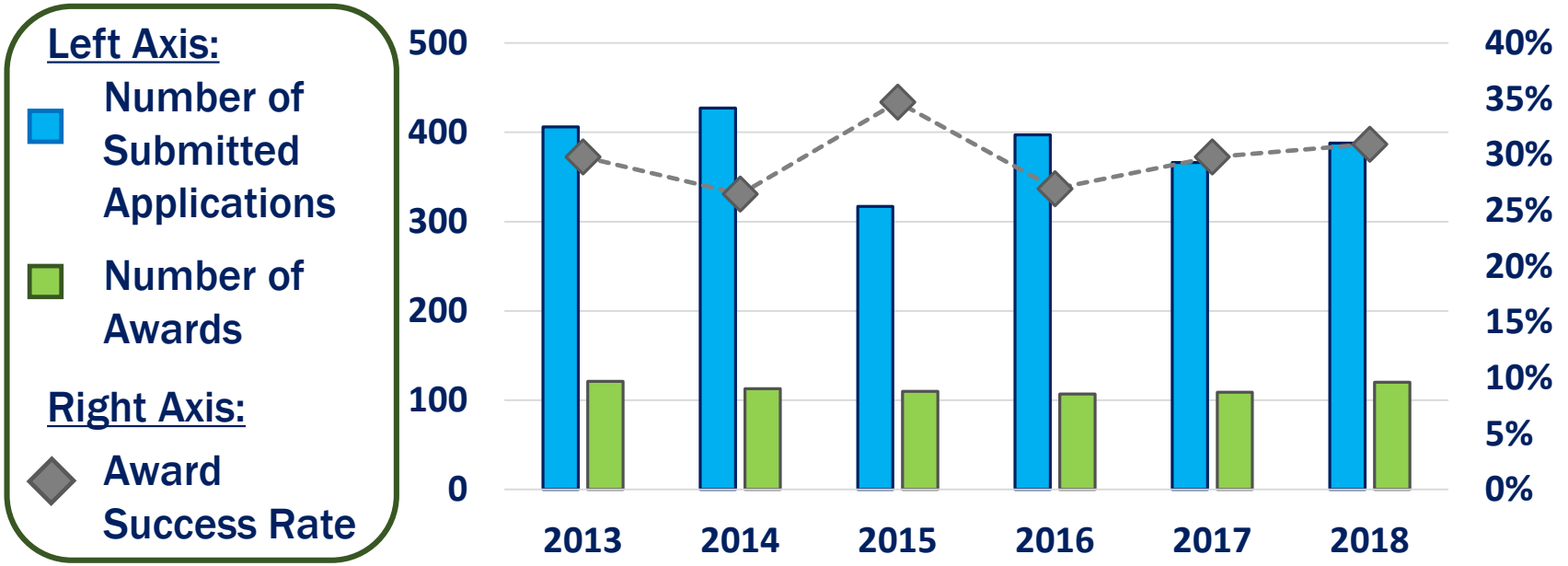
✓ **HEI - High-End Instrumentation Grant Program**
(latest, now expired: PAR19-177)

- All S10 applications are reviewed by the Council of Councils at the January meetings

S10 FUNDING OPPORTUNITIES

Program	SIG	SIFAR	HEI
Budget	$50K - $600K	$100K - $750K	$600K - $2M
Features	Single instrument	Series/clusters of instruments to support workflow	Single Instrument Special technical expertise expected Special Use (other than biomedical research) Instruments (SUI) allowed

APPLICATIONS & AWARDS



- The number of applications received each year is ~ 400.
- The number of awards is about 110 per year.
- In FYs 2013-2018, the overall success rate of the S10 Program was about 27%.

FUNDED INSTRUMENTS: EXAMPLES

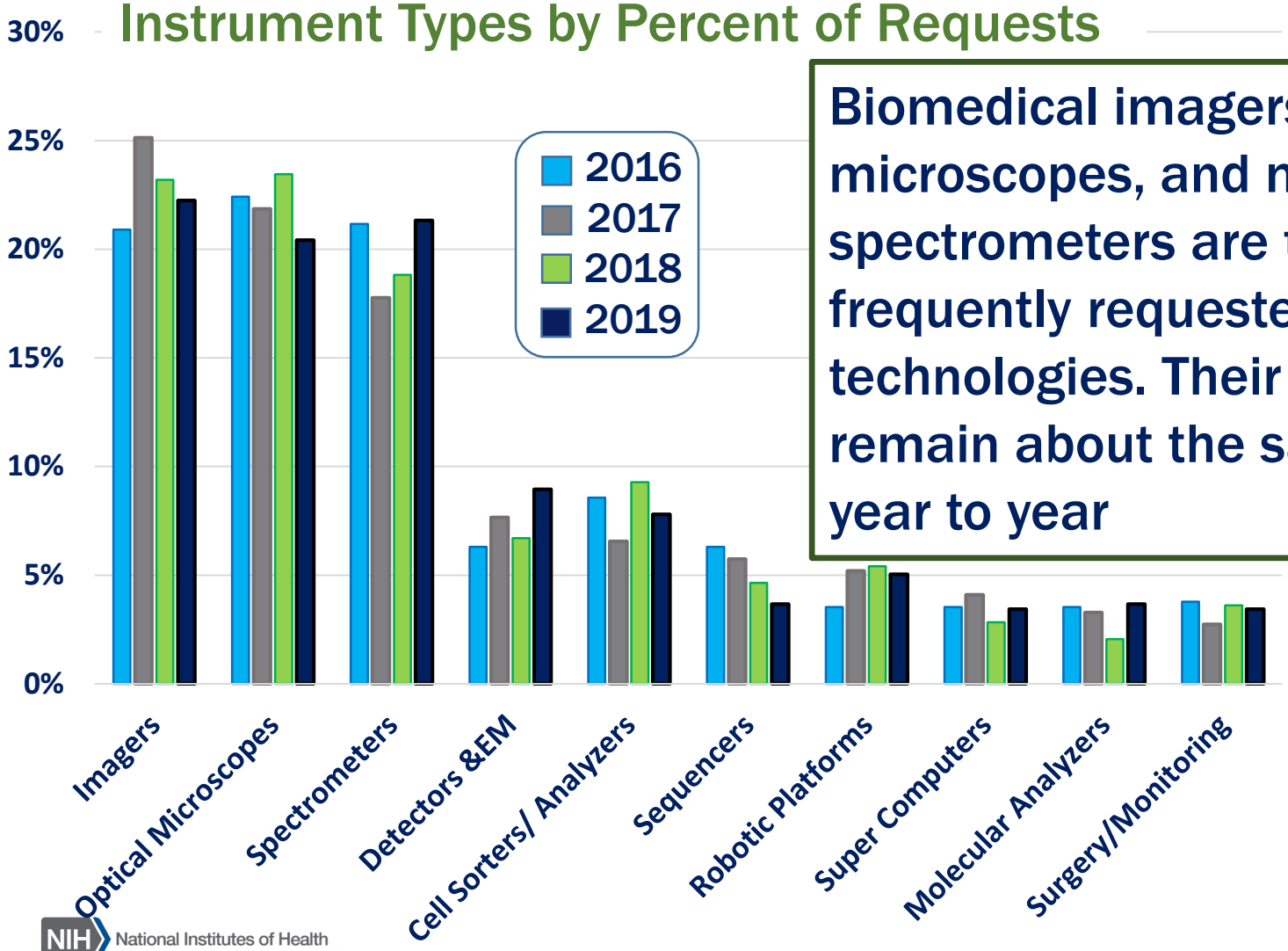
Types of supported technologies include:

- X-ray diffraction systems
- Mass spectrometers
- Sequencers
- Biosensors
- Electron microscopes
- Light microscopes
- Cell sorters/analyzers
- Biomedical imagers
- and OTHERS

As new technologies enter the market, the Program supports them if their need is justified by the use on a shared basis for the benefits of NIH-funded projects

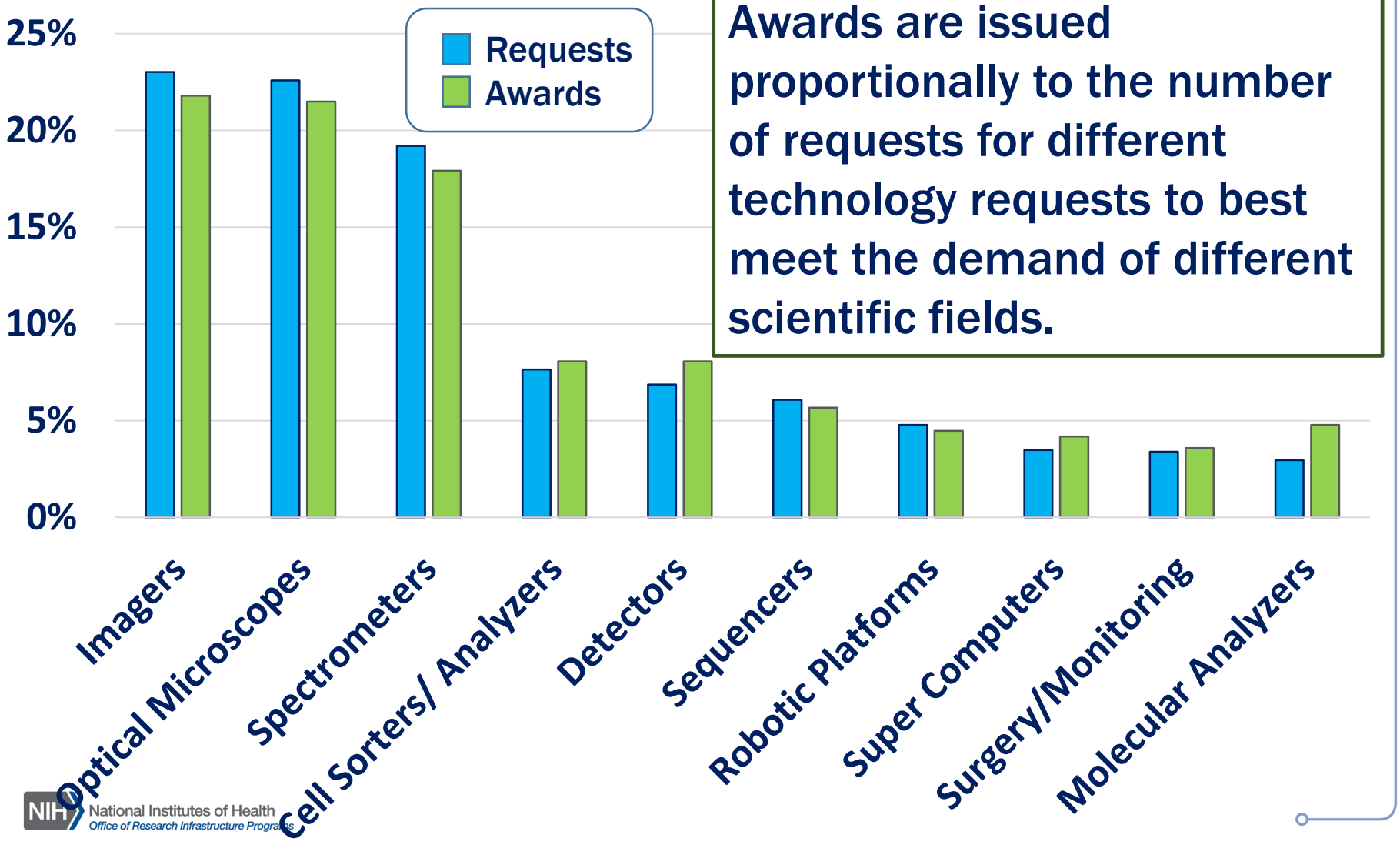
TECHNOLOGY REQUESTS

Instrument Types by Percent of Requests



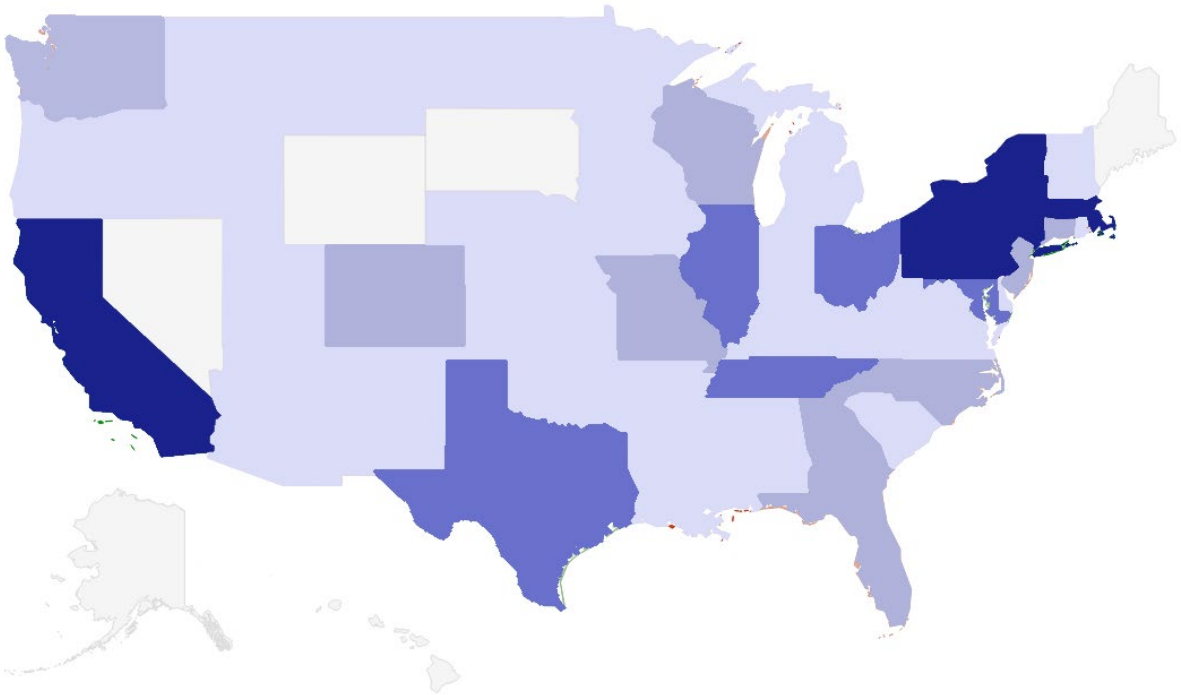
Biomedical imagers, optical microscopes, and mass spectrometers are the most frequently requested technologies. Their proportions remain about the same from year to year

REQUESTS & AWARDS (FYs 2016–18)



Awards are issued proportionally to the number of requests for different technology requests to best meet the demand of different scientific fields.

S10 AWARDS: PER STATE, FYs 2013-18

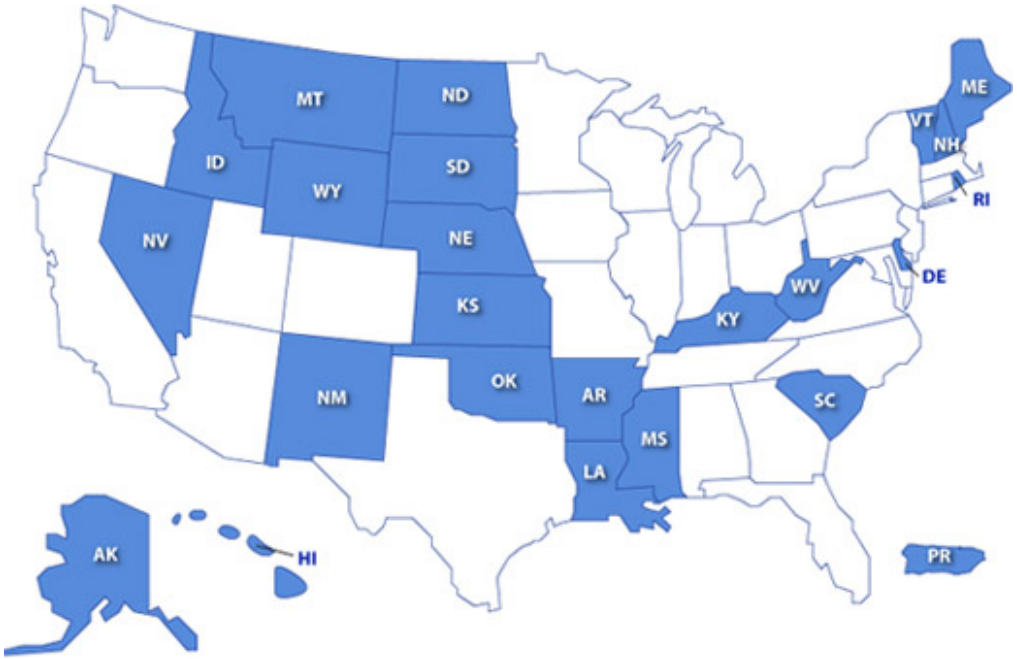


S10 awards per state:

- 0
- 1-10
- 11-20
- 21-40
- Over 40

In FYs 2013-2018, about 800 S10 instruments were awarded to academic and research institutions 44 states and DC. The states with the highest numbers of S10 awards are CA, MA, NY, and PA, corresponding to the highest levels of NIH research funding.

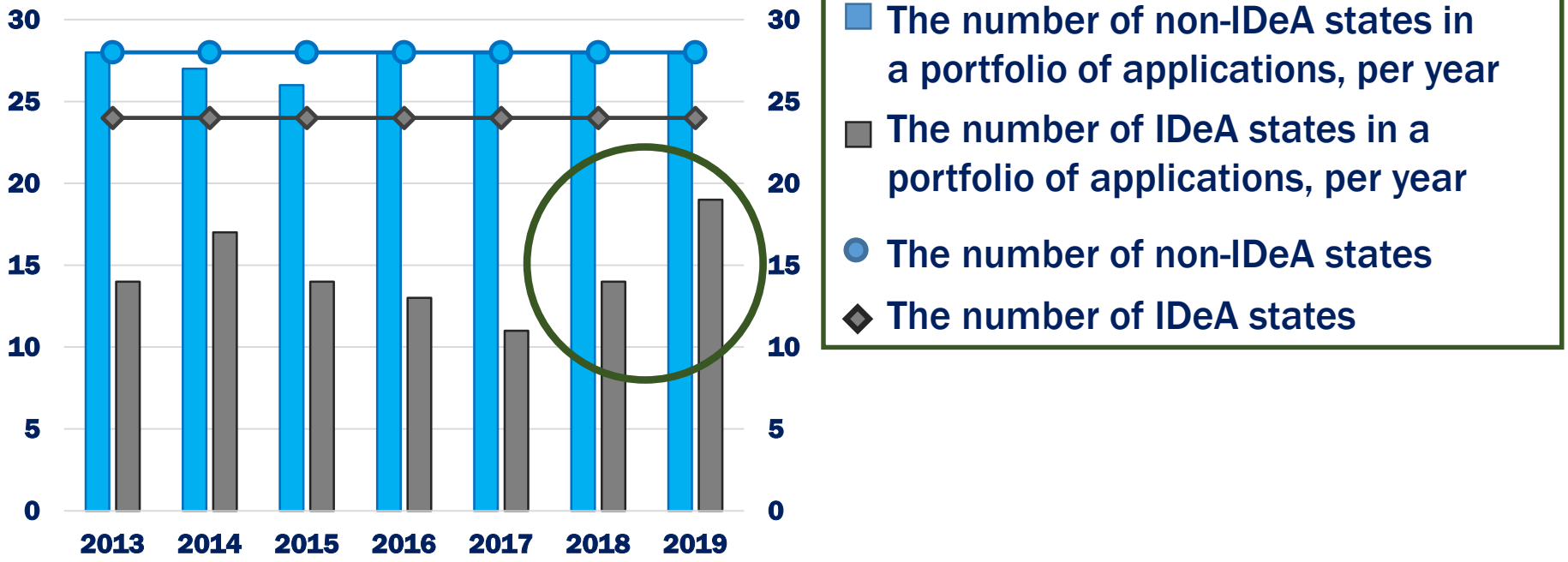
IDeA STATES



- 23 states and one territory eligible for IDeA funding
- 27 states and one district not eligible for IDeA funding

- IDeA-eligible institutions receive less NIH-funding and apply less often for S10 awards - see next slide.
- NIGMS-managed program aims at strengthening biomedical research at IDeA institutions.
- ORIP collaborates with NIGMS to bring in more S10 submissions form IDeA-eligible institutions

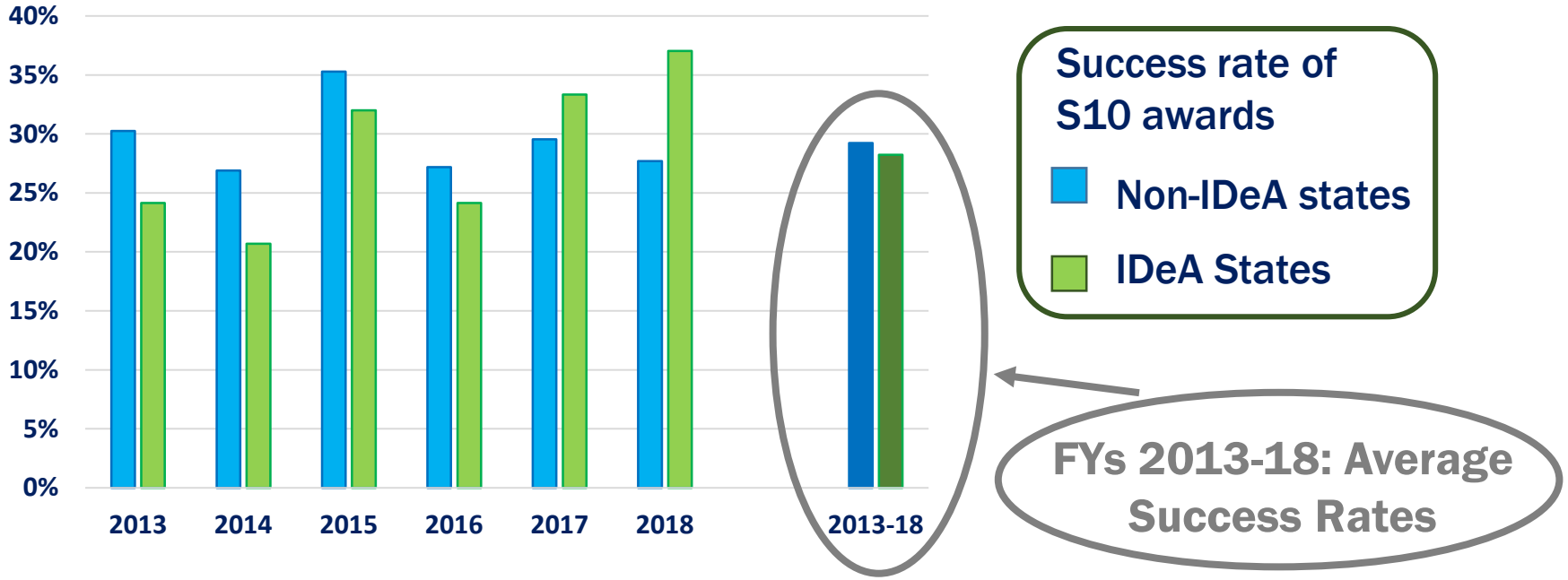
States Submitting S10s : non-IDeA vs IDeA



- Institutions from IDeA states are underrepresented in the S10 portfolio: every year institutions from all non-IDeA states submit S10 applications; only a fractions of IDeA states are represented in S10 submissions in year.

- **Started in 2018, ORIP - NIGMS collaboration brought in more S10 submissions from institutions in IDeA states.**

S10 Success Rate: non-IDeA vs IDeA States

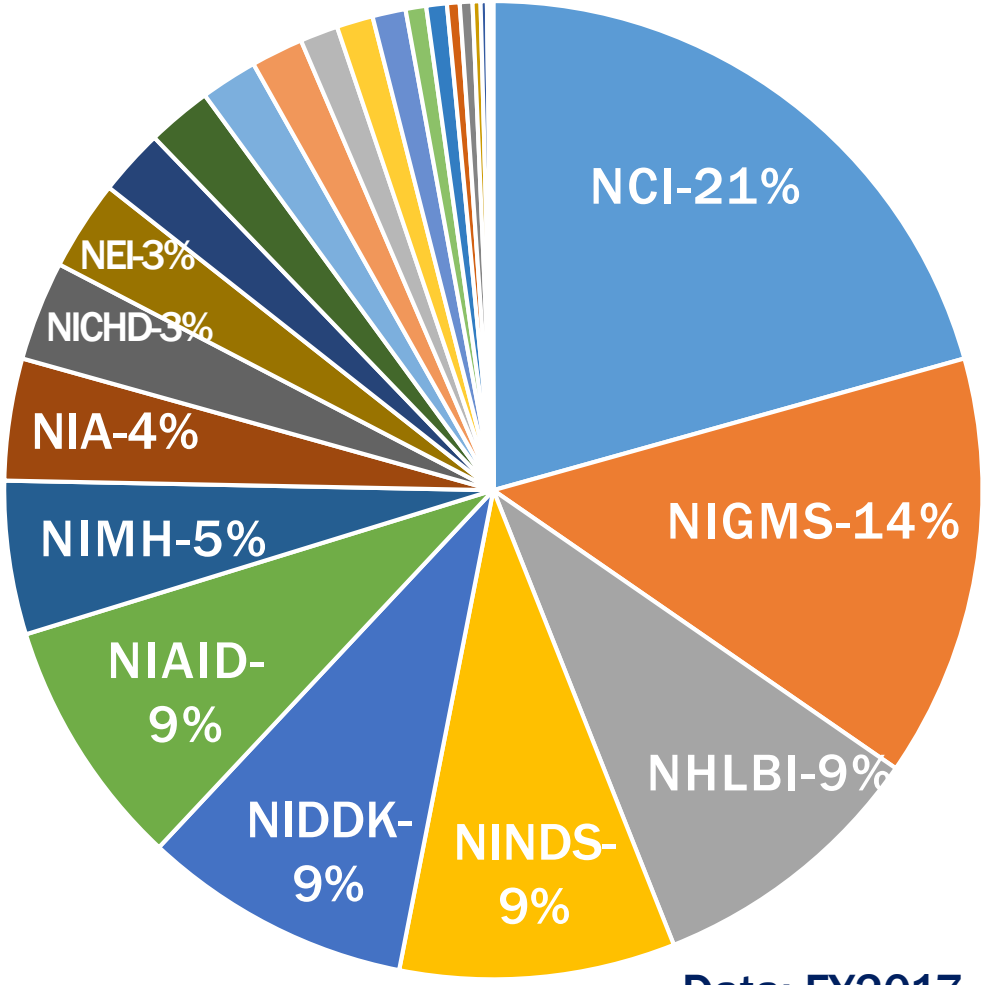


- ORIP-NIGMS collaboration led to the increased the number of S10 awards to institution in the IDeA states, increasing the success rate of S10 applications from such states

NIH-WIDE BENEFITS

- Each S10 award lists about 15 Major Users relying on the instrument

- Chart displays % of grants awarded by individual ICs, represented on S10 awards

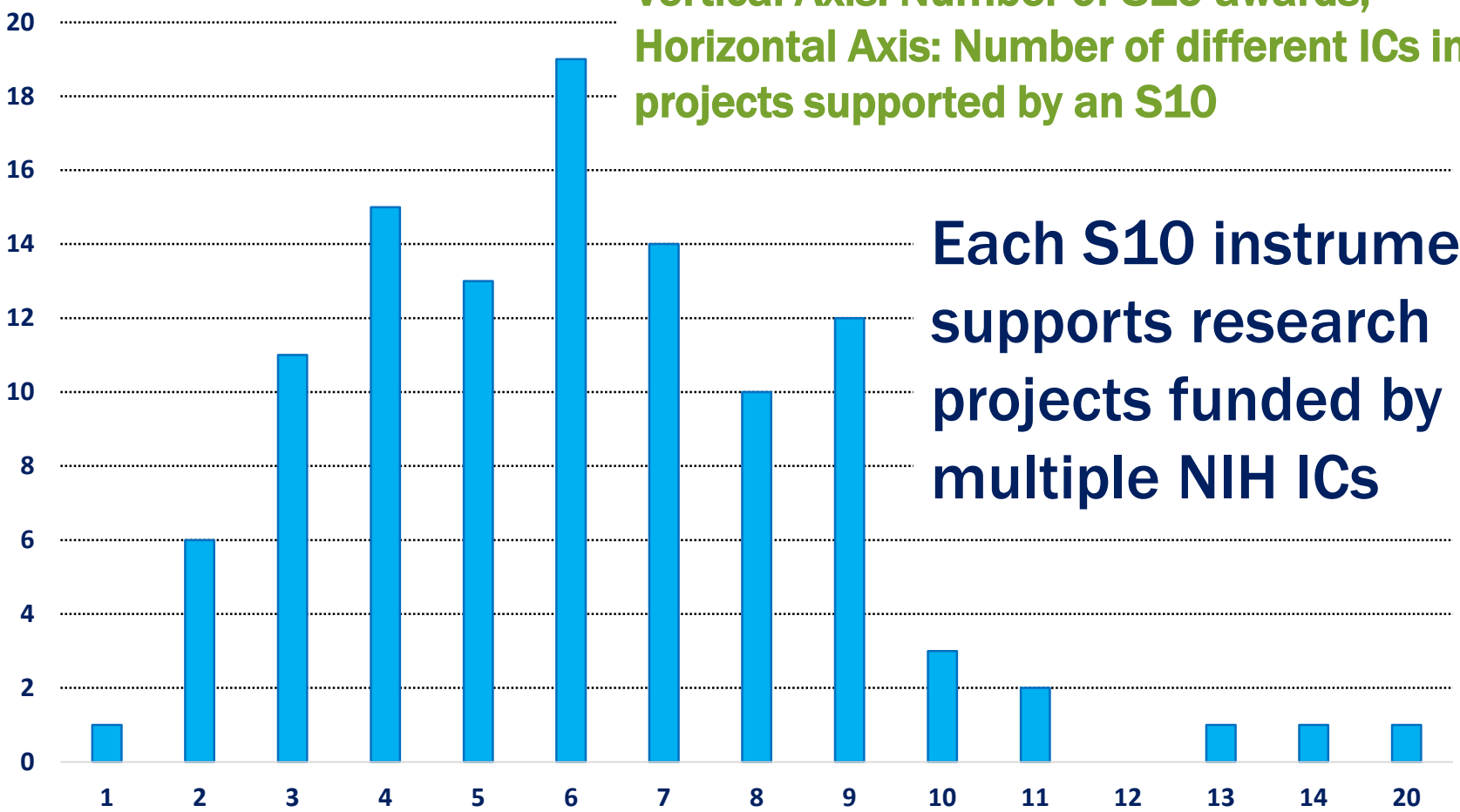


~%2- NIDA, NIBIB, NIAMS, NIEHS
~%1- NIDCD, NIDCR, NIAAA
<%1- NCCIH, NHGRI, NINR, NCATS, OD, NLM, NIMHD

Data: FY2017

S10s: Funded Instruments & ICs

Vertical Axis: Number of S10 awards;
Horizontal Axis: Number of different ICs in projects supported by an S10



Each S10 instrument supports research projects funded by multiple NIH ICs

Data: FY2017

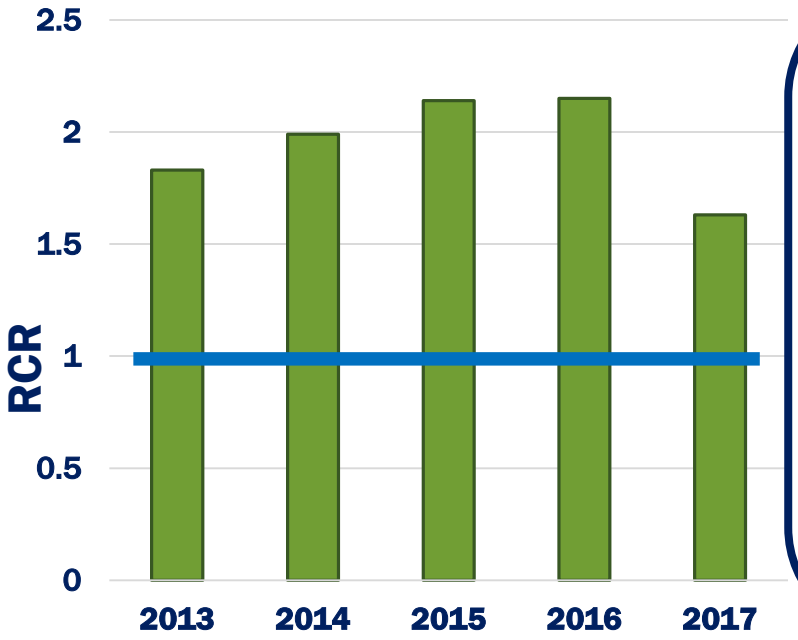
National Institutes of Health
Office of Research Infrastructure Programs

Average # of ICs per an S10: 6.1; Median: 6; St. Deviation: 2.8

PUBLICATIONS

- In FYs2012-2018 over 5,000 scientific publications acknowledged the use of S10-funded instruments
- The publications appeared in about 1,100 different scientific journals

PUBLICATIONS



Blue line represents the trans-NIH mean RCR value. **RCR – Relative Citation Ration** - is a citation-based measure of scientific influence of one or more articles. It is calculated as the citations/year of each paper, normalized to the citations/year received by NIH-funded papers in the same field and year. A paper with an RCR of 1.0 has received the same number of cites/year as the average NIH-funded paper in its field.

- On average, publications acknowledging usage of S10 awards have higher scientific impact than the average NIH-funded paper in the same field as measured by the mean RCR. The mean RCR for S10-related papers ranges from 1.63 (FY 2017) to 2.15 (FY 2016).

IMPACT: Qualitative & Quantitative Measures

- **The S10 Program** offers access to a large variety of state-of-the-art instruments, that would be unavailable otherwise
  - ✓ Meeting broad needs: “work horses”
  - ✓ Supporting emerging technologies
- **Recipients:** Hundreds of academic/research institutions nationwide
  - ✓Core facilities
  - ✓Research Centers
  - ✓Research-intensive institutions
  - ✓Institutions in IDeA-eligible states

IMPACT: Qualitative & Quantitative Measures

- Enabling & enhancing **NIH-funded research**:
  - ✓ Serving as a seed for research communities
  - ✓ Supporting thousands of research projects funded by all NIH ICs
  - ✓ Supporting all fields of biomedical research
  - ✓ Supporting thousands of investigators & their laboratories
- Generating **data** for high-profile **publications**:
  - ✓ Number of publications
  - ✓ Quality of publications: RCR factor
  - ✓ National and international collaborations

CONCEPT CLEARANCE

- Continue support for the shared instrumentation program