This presentation provides the initial results from a retrospective study of American Association for the Advancement of Science’s (AAAS) Panel Reports about the implementation of NIH INBRE (IDeA Network for Biomedical Research Excellence) awards, with this initial study primarily focused on the nine most recent reports prepared for nine separate states. INBRE awards are large ($20 million) awards provided to collaborative, state-wide, multi-institutional programs, one per state, in order to build biomedical research capacity. Over the past 17 years, AAAS’s Research Competitiveness Program (RCP) has assisted INBRE-selected states with their program implementations by leading expert Panel assessments and guidance when requested by the state, with the results provided in confidential reports. For this initial study of the nine most recent reports, RCP examined commonalities among the reports regarding strengths, challenges, strategies, and impacts that the INBRE programs have exhibited, then presented overarching, nonconfidential results to the NIH IDeA community at the 2018 National IDeA Symposium of Biomedical Research Excellence (NISBRE) Conference in Washington, DC. The goal of this presentation is to indicate overarching trends that may help create discussion within the INBRE community about best practices for improving INBRE programs.

Annette Olson, Ph.D.
NISBRE, Washington DC,
June 24th, 2018
A Retrospective Study

AAAS’s Research Competitiveness Program (RCP) – lead expert, peer-based panels for INBRE assessment and guidance

- 17 years
- 14 states
- 71 reports
Goals in Studying our Reports

- To improve our processes
- To share with the INBRE community observations gained over RCP’s lifetime. Why now?
  - Personal observations from site visits and the reports
  - Interest expressed from the INBRE community
- To provide a guide to topics for any potential INBRE workshops.
Initial Phase

▪ Two main data subsets:
  • The *latest* reports from all states in the past three years, N=9
  • Comparison of recent reports with reports from the same states, ~5 years earlier, = 4 states.

▪ Broad strokes/Confidential
  • Percentages of states; will not identify any states
  • No specifics given on strategies/recommendations employed that are not public.
  • This initial study will not be published.
Goal of Presentation and Discussion Today:

- Overview of results from initial phase
- A response to the main challenges?
- A response to common strategies/AAAS recommendations?
- Questions or comments about the assessment and reporting process?
- Next steps and level of sharing information?
Table of Content

- The RCP Assessment and Reporting Process
- Types of Findings within the Reports
- Data subset #1 – the most recent reports
- Data subset #2 – comparison of recent to 5 years earlier
- Similar Results?
- Next steps
# Table of Content

- **The RCP Assessment and Reporting Process**
  - INBRE requests/charge to the AAAS panel
  - Panel Expertise
  - Process itself
- **Types of Findings within the Reports**
- **Data subset #1** – the most recent reports
- **Data subset #2** – comparison of recent to 5 years earlier
- **Similar Results?**
- **Next steps**
The Assessment and Reporting Process for INBRE Programs

Based on the need of each INBRE state, we construct, facilitate, and lead expert panels who provide independent assessment of and guidance to the program.

It helps the INBRE state fulfill a NIH requirement, but our purpose is to mobilize scientific and administrative peers who have similar experience in implementing programs, to help strengthen a program at various stages.

Formative (early, mid-course), Summative, Specialized
Three Types of Assessment for which INBRE States often utilize AAAS Panels and their Report

Assess the:

- *State of progress towards goals* (e.g., original proposal), and make recommendations – simplest.

- *State of the system*, as a whole or just of components, and make recommendations – broader.

- *State of the system* but also *discuss with* the state INBRE and *brainstorm* on problems, find solutions to needs.

Provide a communication vehicle for partners/participants – both directions
The Assessment and Reporting Process

- Discussion with the PI to understand the program and its assessment needs; develop a *Charge to the Panel* together
- Recruit appropriate experts, usually three...

- PI, with our panel’s feedback, develops agenda for site visit
- Panel reviews INBRE-provided background materials
- On site, hold semi-structured interviews with stakeholders
- Deliberate on findings and recommendations
- Verbal debrief of *initial* findings on site
- Write report to the program leadership that can be referenced for implementation, addressing feedback.
Panel Composed of 50% Senior Academic Leadership

Average Panel Composition, all Reports 2015-2018, N=14

Three reports were removed from pool as the exact same panel was requested/returned
Diverse Range of Expertise on AAAS Panels

Percentage of Panels with Specific Expertise, all reports 2015-2018, N=14

- Undergraduate Research (UGR)
- Specific Field of Science
- Partnerships or Stakeholders
- Faculty Development
- Federal Funding
- Strategic Planning
- Core Facilities, esp Bioinformatics
- Sustainability Planning
- Innovation, Biotech Transfer
- Evaluation
- Cyberinfrastructure
- Outreach, Diversity, URM
- State Experience

(Category assignment based on CVs, websites, referrals, and AAAS experience with panelists.)

(Categories are not exclusive)
Most Recent Panels, 8 out of 9, have INBRE Experience

INBRE experience is defined as having:

- Served as a former PI or PC of an INBRE program
- Served/Serving on an INBRE EAC
- Served on at least 3 AAAS panels for at least two INBRE states
- Served as a former NIH Program Officer in NIGMS
The Assessment and Reporting Process for INBRE programs, Continued

- Discussion with the PI to understand the program and its assessment needs; develop a Charge
- Recruit appropriate experts

- Develop an agenda for site visit
- Review background materials
- On site, hold semi-structured interviews with stakeholders
- Deliberate on findings, including recommendations
- Verbal debrief of initial findings on site
- Write report to the program leadership that can be referenced for implementation.
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  - Similar Results?
  - Next steps
Four types of “Findings” in AAAS INBRE Reports

For this initial study, data examined focused on “findings” within a report – generally statements from the panel to the INBRE PI about:

- Strengths/Progress of the program;
- Challenges to potentially be concerned about;
- Impacts of any Past Strategies already implemented;
- Recommended Strategies.
Relationships between Findings:

Needs, Issues, Barriers, Missed Opportunities.

- Progress/Strengths
  - INBRE Provided
  - Panel Found

- Challenges

- Strategies
  - Strategies INBRE is/has already implemented
  - Past AAAS Recommendations – implemented?
  - Report Recommendations

- Impacts
  - Challenges
  - Improvements
Categorized

- **Strengths, Challenges, and Strategies** categories, based on AAAS Report headers, 2005 INBRE Evaluation Plan, 2008 COBRE Evaluation, individual State INBRE evaluation plans (public), and a pilot AAAS EPSCoR Report self-study.

### Theme (N=7)

- Collaborations/Partnerships
- Communication
- Research Capacity
- Education/Outreach
- Evaluation
- Strategic Planning/Implementation
- Sustainability

| Sub-Categories (N=41) | Collaborations/Partnerships | Collaborations/Partnerships - Institutional Assortment | Communication - Branding/Marketing | Communication - Geographic dispersion, constraints | Communication - Internal* | Core Facilities Services | Data Management | Dissemination | Education/Outreach - Diversity | Education/Outreach - K-12 | Education/Outreach - broad | Evaluation - Challenges | Evaluation - Methods | Faculty/Personnel Development | Faculty/Personnel Mentoring | Faculty/Personnel Recruit/Retention | Faculty/Personnel Successes/outputs* | Funding (Internal to institutions) | Funding (Internal to institutions) - equipment | Implementation/Internal Integration* | Institutional Support |
|-----------------------|-----------------------------|------------------------------------------------------|-----------------------------------|---------------------------------------------------|---------------------------|------------------------|----------------|----------------|----------------------------|-----------------|----------------------------|--------------------------|----------------|-----------------------------|---------------------------|--------------------------|-----------------------------|-----------------|-----------------------------|
| **Institutional Mission** |                            |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Leadership**         |                            |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Leveraging**          |                            |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Outreach/External Engagement** |                      |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Outside Impacts - Funding** |                        |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Post-doc/Graduate Education** |                    |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Physical/Facility Infrastructure** |                 |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Resource Management** |                            |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Resources - General, Other** |                          |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Scientific expertise** |                            |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Strategy** |                            |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Sustainability** - funding opportunities |                      |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Sustainability** - Other |                            |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Sustainability** - Succession |                       |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Undergraduate Curricula** |                        |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Undergraduate Mentoring** |                      |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Undergraduate Recruitment/Transfer** |                    |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Undergraduate Research** |                            |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Undergraduate Training/Workshops** |                      |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Workforce Development** |                            |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
| **Overall** |                            |                                                      |                                   |                                                   |                           |                        |                |                |                            |                 |                            |                          |                |                             |                            |                |                            |                 |                |
Impact Categories

Modified from NIH goals from RFA, website, the 2017 national INBRE PI meeting, and additional impacts noted by Panels.

- **Multidisciplinary network**
  - Partnerships/collaborations
  - External Engagement (e.g., Industry)

- **Admin/Management Changes**
  - Culture
  - Policy/Procedures
  - Sustainability

- **Institutional Improvements – Infrastructure**
  - Core Facilities
  - Equipment/Facilities

- **Research Capacity at Institutions**
  - Internal and External Visibility
  - Faculty Recruitment
  - Research Support
  - Early Career Faculty Development
  - Graduate Development
  - (Research Products)

- **Pipeline for Undergraduates/UGR**
  - UG retention in STEM
  - UG research training/mentoring
  - (UG products – research)
  - (UG products – education)

- **Outreach activities to institutions**
  - UG Recruitment to STEM – general
  - UG Recruitment to STEM - diversity
  - K-12

- **Workforce Training and Placement**
  - Job Creation & Placement
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The most recent assessments have covered 3 regions

Number of AAAS INBRE Site Visit Reports (2015-2018) - Most Recent

Region Coding (based on NIGMS IDeA Regions)

N= 9 States

Southeast: 3
Northeast: 5
Central: 1
Proportion of Findings, N=1116 Total Findings.

- Impacts: 34%
- Challenges: 21%
- Strategies - Recommendations: 31%
- General Strengths/Progress: 14%
General Progress/Strengths by Theme, N=154

*From the last reports from nine states*

<table>
<thead>
<tr>
<th>Theme</th>
<th>Total Frequency over 9 reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Planning/Implementation</td>
<td>50</td>
</tr>
<tr>
<td>Collaborations/Partnerships</td>
<td>39</td>
</tr>
<tr>
<td>Research Capacity</td>
<td>35</td>
</tr>
<tr>
<td>Education/Outreach</td>
<td>14</td>
</tr>
<tr>
<td>Evaluation</td>
<td>7</td>
</tr>
<tr>
<td>Communication</td>
<td>6</td>
</tr>
<tr>
<td>Sustainability</td>
<td>3</td>
</tr>
</tbody>
</table>
Challenges by Theme, N=265

From the last reports from nine states, includes challenges put in the Charge

- Research Capacity
- Strategic Planning/Implementation
- Communication
- Collaborations/Partnerships
- Education/Outreach
- Evaluation
- Sustainability
## Most Common Challenges?

**Average of frequencies in Subcategories over 9 reports**

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation/Internal Integration*</td>
<td>6.86</td>
</tr>
<tr>
<td>Institutional Mission/Attitude</td>
<td>3.14</td>
</tr>
<tr>
<td>Institutional Support</td>
<td>2.71</td>
</tr>
<tr>
<td>Collaborations/Partnerships</td>
<td>2.57</td>
</tr>
<tr>
<td>Leveraging</td>
<td>2.29</td>
</tr>
<tr>
<td>Communication - Internal*</td>
<td>2.14</td>
</tr>
<tr>
<td>Communication - Branding/Marketing</td>
<td>2.14</td>
</tr>
<tr>
<td>Strategy*</td>
<td>1.57</td>
</tr>
<tr>
<td>Leadership*</td>
<td>1.14</td>
</tr>
<tr>
<td>Undergraduate Mentoring</td>
<td>1.00</td>
</tr>
<tr>
<td>Evaluation - Methods</td>
<td>1.00</td>
</tr>
<tr>
<td>Collaborations/Partnerships -...</td>
<td>0.86</td>
</tr>
<tr>
<td>Undergraduate Research</td>
<td>0.86</td>
</tr>
<tr>
<td>Funding (Internal to institutions) -...</td>
<td>0.86</td>
</tr>
<tr>
<td>Post-doc/Graduate Education</td>
<td>0.57</td>
</tr>
<tr>
<td>Overall</td>
<td>0.57</td>
</tr>
<tr>
<td>Undergraduate Recruitment/Transfer</td>
<td>0.57</td>
</tr>
<tr>
<td>Communication - Geographic dispersion,...</td>
<td>0.57</td>
</tr>
<tr>
<td>Sustainability* - Other</td>
<td>0.57</td>
</tr>
<tr>
<td>Workforce Development</td>
<td>0.43</td>
</tr>
</tbody>
</table>
What Sub-categories of Challenges (N=265) are Common to All States Assessed?

Core Facilities – but it has multiple type of activities ranging from collaborations/partnerships, research funding for faculty, undergraduate efforts, communication, (even K-12). Need to break out.

Majority of states – at least six states or more

Evaluation
Funding to Institutions
Implementation/Internal Integration
Faculty Mentoring
What Challenges are not Present in the 9 Reports?

- UG Recruitment to STEM - diversity
- Data Management
- Education/Outreach - K-12
- Faculty/Personnel Successes/Outputs*
- Post-doc/Graduate Education
- Workforce Development
Strategies by Theme, N=622

*From the last reports from nine states, includes Past Strategies Discussed and Current AAAS Recommendations*

- Research Capacity: 214
- Strategic Planning/Implementation: 136
- Education/Outreach: 76
- Evaluation: 60
- Communication: 57
- Collaborations/Partnerships: 54
- Sustainability: 29

Total Frequency over 9 reports
Most Common Strategies?

Average of frequencies in Subcategories over 9 reports

Includes both past strategies discussed and current AAAS Recommendations
What Sub-categories of Strategies are Common to All States Assessed?

Collaborations/Partnerships
Faculty/Personnel Development (e.g., funding terms, training, seminars)

Majority of states (at least 7 states or above)
Communication - Internal
Evaluation - Methods
Funding to Partner Institutions

Core Facilities
Faculty Mentoring
What Strategies are not Present in the 9 Reports?

None – all Subcategories (N=41) regarding INBRE implementation have strategies listed.
Most Common AAAS Panel Recommendations?

Recommendations (N=75) v. Suggestions (N=32)

Recommendations and Suggestions

- Faculty/Personnel Development
- Evaluation - Methods
- Faculty/Mentoring
- Collaborations/Partnerships
- Implementation/Integration
Sankey interactive data visualization — over all Subcategories
Sankey diagram – over themes, with empty category-strategy links removed
Sankey diagram – over themes, with the Challenge of Sustainability highlighted, indicating different Strategies utilized/recommended.
Themes shown for Impacts, N=391

From the last reports from nine states

Themes of Impacts

- Pipeline for Undergraduates/UGR: 119
- Research Capacity at Institutions: 92
- Admin/Management Changes: 76
- Multidisciplinary network: 51
- Institutional Improvements – Infrastructure: 34
- Outreach activities to institutions: 34
- Workforce Training and Placement: 3

Total Frequency over 9 reports
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Comparing 4 Recent Reports (2015-2018) to 4 Reports 5 years earlier (2010 – 2012) from the same states....Challenges

With the four states selected by region and then random number generator.

5 Years Earlier

- Research Capacity: 23%
- Communication: 9%
- Sustainability: 10%
- Collaborations/Partnerships: 12%
- Education/Outreach: 13%
- Evaluation: 15%
- Strategic Planning/Implementation: 18%

Recent

- Research Capacity: 31%
- Communication: 15%
- Sustainability: 10%
- Collaborations/Partnerships: 10%
- Education/Outreach: 10%
- Evaluation: 6%
- Strategic Planning/Implementation: 18%
Comparing 4 Recent Reports (2015-2018) to 4 Reports 5 years earlier (2010 – 2012) from the same state...Challenges

With the four states selected by region and then random number generator.

5 Years Earlier

- Research Capacity 23%
- Communication 9%
- Evaluation 15%

Recent

- Research Capacity 31%
- Communication 15%
- Evaluation 6%
Comparing 4 Recent Reports (2015-2018) to 4 Reports 5 years earlier (2010 – 2012) from the same state....Strategies

States selected by region and then random number generator.

5 Years Earlier

- Research Capacity: 27%
- Education/Outreach: 22%
- Strategic Planning/Implementation: 19%
- Evaluation: 10%
- Communication: 9%
- Collaborations/Partnerships: 7%
- Sustainability: 6%

Recent

- Research Capacity: 35%
- Education/Outreach: 14%
- Strategic Planning/Implementation: 20%
- Evaluation: 6%
- Communication: 10%
- Collaborations/Partnerships: 11%
- Sustainability: 4%

Comparing 4 Recent Reports (2015-2018) to 4 Reports 5 years earlier (2010 – 2012) from the same state....Strategies

States selected by region and then random number generator.

5 Years Earlier

- Research Capacity: 27%
- Education/Outreach: 22%
- Strategic Planning/Implementation: 19%
- Evaluation: 10%
- Communication: 9%
- Collaborations/Partnerships: 7%
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States selected by region and then random number generator.
Comparing 4 Recent Reports (2015-2018) to 4 Reports 5 years earlier (2010 – 2012) from the same state.

States selected by region and then random number generator.

5 Years Earlier

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- Next Steps
Similar Results re: Challenges?


“The most difficult unforeseen challenge was loss of the PD or associate PD due to unexpected death or departure from the institution.”

(N=3 states with leadership changes, one due to death);

Discussed at the three states, but also, in at least two additional states, succession planning was a recommended strategy.

Key others noted:
- Funding constraints – external or institutional (N=1)
- Delays in hiring and the construction/renovation of facilities (N=0)
Similar Results re: Strategies?


Strategies found to be most effective

- Conducting rigorous assessments of research progress and monitoring core facilities
- Emphasizing pilot projects as well as subprojects
- Developing a good COBRE website and other outreach strategies
- Establishing a formal mentoring program, selecting mentors with care, and giving junior investigators a supportive environment with adequate protected time, postdocs, and constructive feedback
- Selecting EAC members with care, communicating with them on a regular basis, and encouraging them to assess junior investigators
- Reaching out to senior administrators, communicating with them on a regular basis, and encouraging them to serve on the IAC
- Leveraging COBRE funds to obtain additional support for the center
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- Next steps
Next Steps

▪ Focusing on our methodology to improve our process.
▪ Support key questions on challenges and strategies/recommendations.

Dr. Maysaa Alobaidi, new formal evaluator with RCP

▪ National Institute of Allergy and Infectious Diseases (NIAID)
▪ Henry M. Jackson Foundation for the Advancement of Military Medicine
▪ Ph.D. in Pharmaceutical Sciences

Will help steer the study in the future.
Next Steps - What would you like to see from this study?

**Potential:** 1) a survey, and 2) scanning the background materials provided.

*If so, verification via the INBRE PIs and an IRB.*

- Discussion
- Comment/Questionnaire available for later thoughts
Thank you

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Maysaa Alobaidi, Ph.D.   malobaidi@aaas.org
Additional Slides for any Questions
Future Retrospective Study – Four Types of Data/Variables

Findings – as noted today

AAAS Assessment Characteristics
- # days of site visit, # of institutions visited
- # of panelists, experience,
- formative v. summative, etc.

State Characteristics
- Size of state, population density,
- # of COBREs, etc.

Network Characteristics
- # of participating institutions and type,
- Time in operation, etc.

As independent, third-party assessor, four types of data we could use for our study.

State and Network Characteristics match the 2005 Feasibility Study for the INBRE Program Evaluation.
Sankey interactive data visualization – Northeast compared to Southeast
Moving Towards almost all Panels with INBRE Experience

Panels with at least 1 panelist with INBRE experience

No INBRE Experience

2015-2018, N = 14 reports

2010-2012, N = 7 reports (random)

Percent of Panels

0% 25% 50% 75% 100%
Moving towards increased levels of leadership on panel

<table>
<thead>
<tr>
<th>VPR, Provost</th>
<th>Center Director</th>
<th>Dean or Professor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-2018, N = # reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010-2012, N = 5 reports (random)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percent of Panels
0% 25% 50% 75% 100%