Promoting Multidisciplinary & Team Science at the University of Minnesota

**UMN Northstar Joyriders**

Jayne Fulkerson, School of Nursing
Caroline Gaither, College of Pharmacy
David Ingbar, School of Medicine & CTSI
Michelle Lamere, CTSI
Heather Nelson, School of Public Health
Donald Nixdorf, School of Dentistry
Ned Patterson, College of Veterinary Medicine
Betsy Seaquist, School of Medicine
University of Minnesota (UMN)

- 5 Campuses
- 8th in public University research dollars
  - 31.5K undergrads, 16K grad students
  - 3.9K faculty
- Academic Health Center:
  - 6 schools: Nursing; Vet Medicine; Dentistry; Pharmacy; Public Health; & Medicine
- LITeS project chosen based on input of Senior VP, Deans & Provost
- Trial of UMN as 2nd LITeS site?
Charge

Recommend ways to increase multidisciplinary team science research activity and funding in the UMN Academic Health Center (AHC), with a particular focus on stimulating submission of multi-project large grants (NIH P & U grants for example) that include collaborations across multiple UMN schools.
Team Science at the University of Minnesota

Goal: Increase multidisciplinary team science research activity and funding in the University of Minnesota (UMN) Academic Health Center (AHC), with a particular focus on stimulating submission of multi-project large grants that include collaborations across multiple UMN schools.

Resources and Inputs
- Diverse scientists willing to participate in team science
- Develop and leverage university resources: Financial, Human, Equipment, Measures, Facilities, Educational opportunities
- Leveraging access to resources of other universities/CTSAs
- Internal/External Advisory Boards

Outputs (Activities)
- Expand capacity
  - Regular seminars
  - Speaker series
  - Workshops
  - Interactive web-based and in-person consultation portals
  - Annual conference
  - Mentorship activities
- Facilitate reward system for team science
  - P&T criteria
  - Authorship
  - Cost sharing
  - Fiscal credit
  - Effort allocation
- Build and expand collaborative opportunities across disciplines
  - Scholarly collaboration and integration part of unit cultures and infrastructure
  - Showcase successful multidisciplinary teams
  - Experienced team scientists develop toolkit

Participants
- Faculty
- Students
- Research staff

Short-Term Outcomes/Impact
- Culture shift in faculty interest in multidisciplinary team science
- Development of team science toolkit
- Development of research infrastructure to facilitate team science
- Faculty with skill sets to conduct team science
- Increases in cross-disciplinary teams
- Publications and presentations from team science research
- Cost sharing and fiscal credit agreements across traditional units
- Initiatives to prioritize funding and marketing of team science
- Leveraging additional research grants, equipment and products

Medium-Term Outcomes/Impact
- P&T criteria reflect rewards for team science research
- Practice and policy changes supported by evidence from team science research
- Resources easily leveraged across units for team science
- Established and sustainable UMN and regional team science partnerships
- Nimble response to calls to team science funding initiatives

Long-Term Outcomes/Impact
- UMN culture of cross-discipline team science
- Team science research and products influence clinical guidelines and practice
- Improvements in health addressed by team science research
- Long-term leveraging of resources for sustainability of team science
- Established and sustainable national team science partnerships

Assumptions
- Team science across disciplines is desirable.
- Research activities and methods to support team science will evolve.

External Factors (Barriers and Facilitators)
- Existing leadership vertically integrated rather than across disciplines
- NIH science priorities and support
What is the current state of UMN AHC multidisciplinary team science?

How does UMN compare to other peer (Big 10 and large state) universities in obtaining large NIH P & U research grants?
Number of U & P Grants per Institution

U grants

P grants

Total Number Grants Awarded vs. Number of Parent Grants

University of Michigan, University of Wisconsin, Ohio State University, University of Iowa, Indiana University, University of Nebraska, UC Los Angeles, University of Washington, UNC Chapel Hill, AVERAGE

Total Number of Grants Awarded vs. Number of Parent Grants

University of Michigan, University of Wisconsin, Ohio State University, University of Iowa, Indiana University, University of Nebraska, UC Los Angeles, University of Washington, UNC Chapel Hill, AVERAGE

* indicates significant difference
How is multidisciplinary team science addressed within the AHC P&T process?

• Each AHC School has unique P&T criteria
• No consistent policy to reward team science across the AHC Schools
What are the barriers to increasing multidisciplinary team science in the UMN AHC?

Approaches:
• Survey successful faculty (P; U; Multiple R01s)
• Meet with each AHC Associate Dean of Research
• Survey VP Research at large state universities
Approach 1:
Survey UMN faculty with large grants and multiple R01s about their experiences obtaining large research grants

~210 faculty surveyed
44% full & 10% partial responses
65% Professors; 28% Associate Professors
51% submitted U/P grant, with 65% of those funded
41% of unfunded U/P proposals were resubmitted
71% of funded grants had new collaborations
Investigator Survey Report

For your most recent submitted U/P grant application, how satisfied were you with the support you received?

(PIs who submitted U/P grants only, n~50)
How important are the following to make it easier to submit a U/P grant?

- Preliminary funding
- Greater $ support
- Culture shift
- Greater admin asst support
- Better general admin support
- Coordination across units
- Resource leveraging
- Cost sharing agreements
- P&T alignment

Very important
Team Science Training

- Only 14% of respondents had received formal team science training (senior group)
- Of those with team science training, almost all rated it as either very important or somewhat important
- Of those without team science training, half estimated that it is somewhat or very important
Approach 2:

Perspectives of UMN AHC Associate Deans of Research on obtaining large research grants
Comments of Associate Deans of Research

Some internal support mechanisms exist, but inconsistent

Barriers:
• Difficult to bring together critical mass of PIs in an area
• Need PIs with national reputation as leaders
• Identify & coordinate PIs across schools to work together
• Lack of funding & flexible time for pre-submission planning, prelim data, etc.

Needs:
• Increased faculty cross talk and team enhancement
• Focused AHC hubs of research – right sized (not too broad)
• Augment faculty – ADR interactions to generate ideas
• Provide more official credit for team science
• Faculty need more time & support for risk taken on big grants
What strategies do we recommend to promote and facilitate expanding multidisciplinary team science and large grant submissions at UMN?
Recommended Strategies – Overview I.

- Promote culture of multidisciplinary research including teams and large grants
- Increase UMN faculty involvement in NIH & large funding agency activities
- Increase multidisciplinary cross talk & interactions
- Improve process for development, submission & maintenance of large grants
Recommended Strategies – Overview II.

• Improve reward structure for faculty & departments involved in large grants
• Improve training in team science skills
• Promote pro-active institutional strategies to increase P/U & other large group grants
• Re-assess efficacy & impact of Centers & Institutes
• Improve tracking of UMN grant submissions & outcomes
### Recommended Short Term Actions (selected)

<table>
<thead>
<tr>
<th>Strategic Approach</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve grant development process</td>
<td>• Adopt UMichigan model with annual application cycles for big grant</td>
</tr>
<tr>
<td></td>
<td>▶ Planning awards (2 yrs out)</td>
</tr>
<tr>
<td></td>
<td>▶ Prep awards (1 yr out)</td>
</tr>
<tr>
<td>Improve team science training</td>
<td>• Weblinks to existing TS training</td>
</tr>
<tr>
<td>Increase faculty involvement w/ funding agencies</td>
<td>• Travel funds for faculty to attend research workshops that are likely to develop RFAs &amp; RFPs</td>
</tr>
<tr>
<td>Improve infrastructure &amp; accountability</td>
<td>• Improve tracking of grant submits &amp; outcomes</td>
</tr>
</tbody>
</table>
**Recommended Intermediate Actions (selected)**

<table>
<thead>
<tr>
<th>Strategic Approach</th>
<th>Specific Actions</th>
</tr>
</thead>
</table>
| Improve grant development process                      | • Provide central pool of experienced administrative support (“strike force”)  
• Develop ways for flexible faculty time to respond to RFAs/ RFPs  
• AHC “major grant scout” – notify PIs                   |
| Promote culture of team science & Augment team science training | • Open UMN as 2nd LITeS site  
• Physical space(s) for faculty “collisions” & informal interactions |
| Increase faculty involvement w/ funding agencies        | • Reward faculty for national grant reviews & leadership roles                                                                              |
| Improve infrastructure & accountability                 | • Assign ADRs target goal #s for large grants submitted/year from their School (or collaboratively)                                             |
Going Forward

- Presentations & written report with specific recommendations to:
  - AHC Faculty & leadership groups
  - AHC Deans Council, Provost & Sr. VP
  - AHC Associate Deans of Research
  - Individual AHC Schools
  - CTSI Leadership team
- Move forward with proposed 7.12 modifications
- Decide about export/import of LITeS to UMN
Our sincere thanks to Judith, Susan & Galit and the University of Colorado for this opportunity and an outstanding program

Questions & Comments?
• FORMAL PRESENTATION ENDS HERE

• ANCILLARY SLIDES FOLLOW – to be used depending upon time and discussion
Promote a Culture of Multidisciplinary Research

Highlight successful team scientists as groups
  • Example joint presentations at major venues

Increase interactions of faculty across schools
  • More cross School lectures
  • Team Science / CTSI monthly grand rounds

Encourage early stage collaborations
  • UMichigan model – small grants to support new collaborations with very high funding rate
  • Prize award competitions for early stage results of multidisciplinary new collaborative projects
Increase UMN faculty participation in national grant development and funding activities

- Support faculty participation in NIH, NSF, DOD and other major organization grant reviews and leadership roles - reward participation
- Provide travel funds for faculty to participate in NIH and other organization’s research-oriented workshops, esp for RFA/RFP development
Increase multidisciplinary cross-talk and interactions across faculty (within & beyond AHC)

- Across colleges/units – especially within the AHC units and between the AHC & CSE
- Interest/Disease/Topic focused – with or without Centers or Institute
- Promote interactions of pre-clinical & clinical faculty to encourage translational research
- Provide opportunities & physical spaces for informal discussions (“collisions”)
- Ensure annual update of faculty expertise database as part of annual review process (add as requirement)
Improve development, submission and maintenance process for large grants

• “Grant scout” notifies relevant faculty / ADRs of relevant opportunities
• Create competitive annual solicitation for faculty to develop 2 types of large applications with support of faculty time and prelim data generation:
  – Position Awards (~2 years pre-submission)
  – Grant Development/Submission Awards (~1 year)
  – PI and Department accountability to complete
• Provide experienced administrative support from central pool (Research development specialists)
• Support internal and external pre-submission review
Improve reward structure for faculty & departments involved in large grants

• Revise AHC promotion & tenure guidelines to explicitly recognize team science and unique contributions within teams
• AHC should develop UMN as 2nd LITeS site in collaboration with University of Colorado
• Central support for gap between actual salary vs NIH cap salary for faculty in large grants
• Fiscal rewards of flexible research support $ or bonus salary supplement
• Ensure cross crediting of Schools/Departments/Divisions
Improve faculty training in team science skills

• Provide web-based toolkits (either on a home UMN site &/or linked URLs)
• Define role and responsibility of CTSI (or other locus)
• Import LITeS program to UMN
• Offer seminars, training, and other activities, with some targeted at junior faculty (? CTSI)
Implement pro-active (top-down) institutional strategies to increase submission large group grants

- Develop and maintain a list of nationally-recognized AHC and UMN investigators (including VA and HCMC) by expertise area
- Set target number of annual large grant submissions in each AHC School as responsibility of the ADR (with credit across units)
- Develop ways to increase faculty time flexibility to allow response to time-sensitive RFAs & RFPs
Re-assess the use of Centers and Institutes in the AHC and their contributions to team science

- Do we have too many or too few?
- Do we have the ‘right’ ones?
- Meritocracy vs entitlement?
- Where are there opportunities to be a national leader, rather than following the national trends?
- How can centers/institutes be more effective at facilitating large grants and team/multidisciplinary science?
Improve tracking of UMN grant submissions and outcomes

- Vital info is lacking - grant types & outcomes
- Need improved tracking of UMN grant submissions and outcomes including:
  - Quantitate submissions by mechanism and type
  - Quantitate faculty participation (co-PIs, effort, etc)
  - Outcomes data (scores, percentiles and funding decisions)
Recommendations: 4 (cont.)

• Improve development, submission and maintenance process for large grants
  – Provide experienced administrative support from central pool (prov OVPR) for administrative and fiscal aspects of grant preparation = “Research Development Specialists” - this likely aligns with plans of OVPR Connectors group
  • Import details from Betsy’s proposal (or append to recommendations)
Recommendations: 4 (cont.)

• Improve development, submission and maintenance process for large grants
  – Provide administrative and fiscal support for internal and external reviews of large grants two and one months in advance of submission, respectively
  – Early notification of relevant faculty of relevant new RFAs/RFPs by ‘grant scout’
Recommendations: 5 (cont.)

Improve reward structure for faculty and departments involved in large grants

– Develop cross-crediting system for large awards so that credit is distributed to involved Departments and Schools

– Consider central support for the gap between actual and NIH cap salaries + fringe for faculty supported by large grants
Recommendations: 5 (cont.)

Improve reward structure for faculty and departments involved in large grants

– Consider other rewards for faculty with effort funded by large grants – such as research support do higher risk science
– Increase visibility of successful teams and investigators (as above)
– Bonus for each project/core leader on large grants (TDC > $X) – small in year of submission; larger reoccurring years
Recommendations: 7 (cont.)

Pro-active institutional strategies to increase applications for large group grants

– Develop ways to increase faculty flexibility to respond to time-sensitive large RFAs and RFPs. (If everyone is time-committed to the max, then freeing up time is very difficult and opportunities go by the boards)
Specific Recommendations and Suggested Timelines for Action

• Short-term (< 12 months)
• Intermediate (1-3 years)
• Long-term (> 3 years)

• See Table (hard copy)
<table>
<thead>
<tr>
<th>Approach / Timeline</th>
<th>Short-Term &lt; 1 year</th>
<th>Intermediate 1-3 years</th>
<th>Long-Term &gt;3 years</th>
</tr>
</thead>
</table>
| Improve process for grant development | • Adopt UMichigan model of grant planning & prep award (2 types) (? Divert existing $) | • Provide experienced administrative support pre-grant submission  
  • “strike force”  
  • Develop ways to have flexible faculty time to respond to RFAs/RFPs  
  • AHC ‘scout’ to notify relevant faculty of grant opportunities | |
| Promote Culture Of Team Science & Reward Involvement | • Faculty working group with ADRs  
  • Increase faculty interactions across disciplines | • Alter AHC 7.12 P&T statements  
  • Ensure cross crediting of Depts/Schools for large grants  
  • Offer small starter collaborative grants w/ high funding rate | • Physical spaces for faculty ‘collisions’ or ‘teatimes’  
  • Salary supplements or flexible research $$ rewards. |
| Improve Team Science Training | • Weblinks | • Open UMN as 2nd LITeS site | • Targeted CTSI programs |
| Increase faculty involvement in NIH/funder grant development | • Travel funds for research workshops (leading to RFAs) | • Reward faculty for national level grant reviews & leadership roles | |
| Improve institutional infrastructure & accountability | • Improved grant tracking (submits & outcomes) | • ADRs have target goals for # large grants submitted/year  
  • Periodic review of progress (q2Y) | • Review roles of Centers/Institutes in promoting large grants |
How important are the following to make it easier to submit a U/P grant?

- Team Science training
- Greater SPA support
- Process for identifying collaborators
- Greater recognition
- Team Science resources
- Toolkit
- Earlier notification
- P&T alignment
- Cost sharing agreements
- Resource leveraging
- Coordination across units
- Better general admin support
- Greater admin asst support
- Culture shift
- Greater $ support
- Preliminary funding

Very important, Somewhat important, Unimportant