Recognition for Team Science and Cross-disciplinarity in Academia: An Exploration of Promotion and Tenure Policy and Guideline Language from Clinical and Translational Science Awards (CTSA) Institutions

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Some questions from the field

- Do P&T policies/guidelines matter?
- Do P&T policies/guidelines effect culture change or reflect culture change (or lack thereof)?
- What is the role of these in influencing the way faculty are evaluated and incentivized?

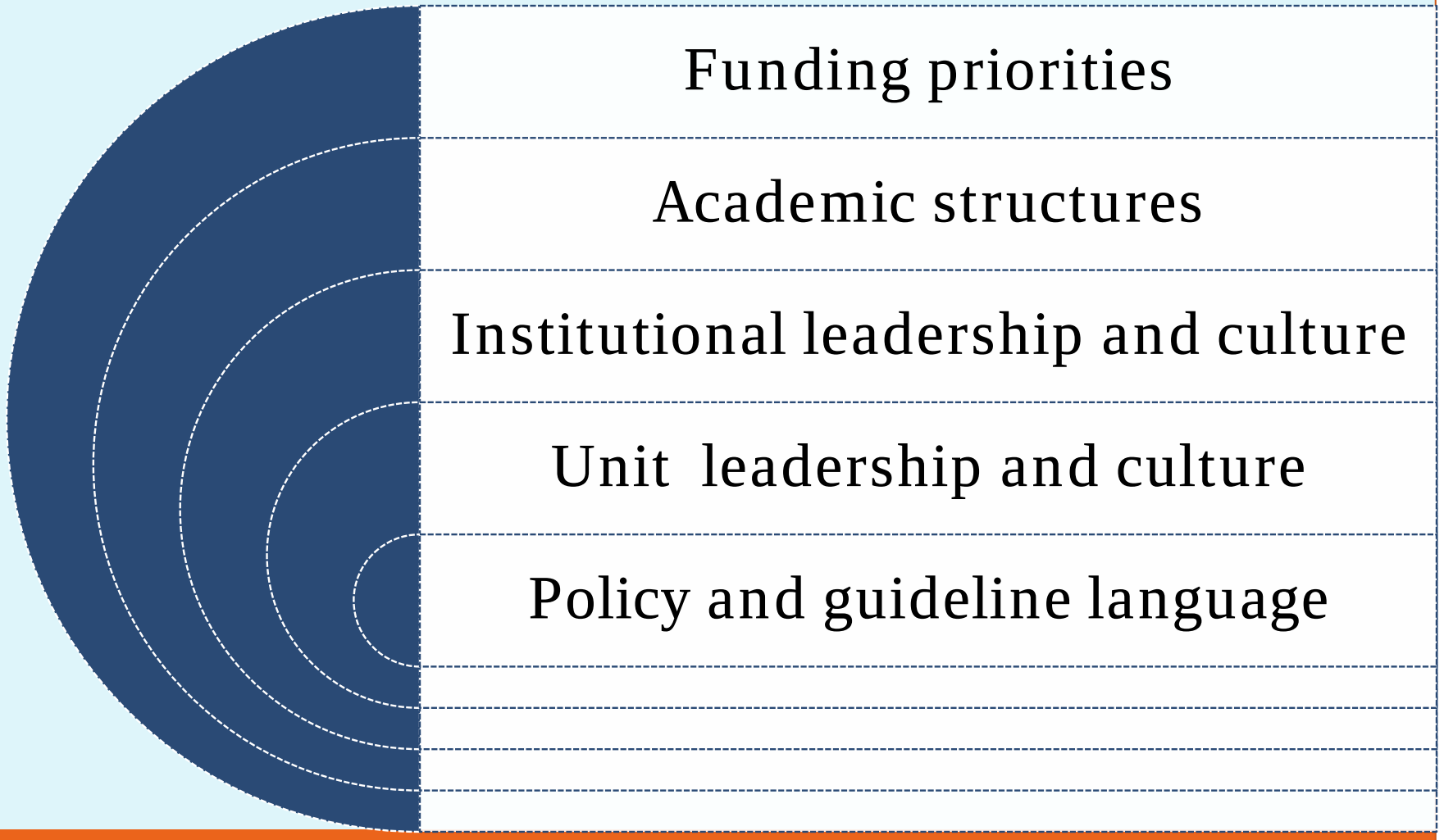
Some of my views

- Review of P&T policies/guidelines provides a way to take the **pulse of academia** with respect to the recognition of team science
  - Combined they provide a *gestalt*, a reflection of **the evolution of** priorities and culture in academia

- P&T policies/guidelines by no means represent the entire story. Policies **cannot effect change independently**, but are one important contributor to the multiple interacting factors that create academic culture.
  - E.g., If a P&T policy stated that research generated in the context of a team would not be considered in reviews– this would likely represent a critical barrier for progress in TS

- Metrics, **assessments drive behavior**.
  - We need to assess what we want to see.

Examples of Contextual Influences on P&T



Examining P&T Policy and Guideline Language

- Qualitative analysis of P&T policy/guideline language relevant to team science and cross-disciplinary research from institutions that received National Institutes of Health **Clinical and Translational Science Awards** (CTSAs).
  - CTSA Mission - Accelerating Discoveries Toward Better Health. **Working together**, we can help shape the future of healthcare.
  - Site budgets: range from $4M - $23M/year. Total Initiative budget: $461M in FY2012
  - "...one of the nation's most important resources for clinical and translational science" - IOM, 2013

- The analysis aims to...
  - Shed light on the extent to which these institutions' P&T policies **recognize team science and cross-disciplinary research**,
  - **Characterize ways that these institutions evaluate faculty** involvement in team science and cross-disciplinary research, and
  - **Point to future directions for research** to inform policy recommendations.

Methods

- Most P&T policies are **not publically available**
- Emailed central administrators and medical school faculty affairs representatives at 60 CTSA institutions. Requested they send excerpts from P&T policies/guidelines addressing:
  - **"collaborations/collaborative activity, multi/interdisciplinary research and scholarship, and/or team science."**
- Received responses from 42 institutions
  - 32 sent us P&T policy and guideline excerpts
  - **10 indicated they did not have P&T language specific to these topics**
- Conducted qualitative content analysis of the excerpts
  - Using Dedoose and NVIVO software

Results – Macro view: Three types of content in P&T documents

- ***Acknowledgement*** of team science
  - About half of the excerpts highlighted the significance and prevalence of collaborative and/or cross-disciplinary scholarship in advancing science, and the need to consider such scholarship in P&T decision making.
- ***Criteria*** for evaluating participation in team science
  - Most of these excerpts included criteria for evaluating participation in team science, such as demonstration of contribution/leadership, authorship order.
- ***Process*** for evaluating participation in team science
  - About half of these institutions' specifying sources of evidence that should be included in dossiers to demonstrate the value of their contributions to ID or collaborative research, less frequently providing guidance for documenting contributions

Acknowledgement of Team Science

- Significance/prevalence of Team Science in advancing science (13)
- Recognition of the need to consider Team Science in P&T (10)
- Minor/indirect language about Team Science (6)
- Encouragement for faculty to pursue Team Science (5)
- Proposed/informal/tentative language about Team Science (4)
- Inclusion of Team Science in definition of scholarship/excellence (2)
- Qualified language of Team Science (2)

Acknowledgement of Team Science

"While the evaluation of research accomplishment has traditionally focused on the faculty member's individual achievements, including first and senior authorships and funding as principal investigator, the **present and future of science will place increasing emphasis on interdisciplinary research team science**. Where relevant, therefore, a faculty member's contributions to **interdisciplinary research team science shall also be considered**."

Criteria for Evaluating Team Science

- Demonstration of contributions (25)
  - Demonstration of unique/original/independent contributions (14)
- Discussion of authorship/credit (11)
  - Guidelines for “counting” collaborative work (3)
- Demonstration of leadership in collaborative work (6)
- Demonstration of impact of collaborative work (6)
- General consideration of Team Science in evaluation (2)
- Team Science as a sign of reputation (1)

Criteria for Evaluating Team Science

"Participation in collaborative, multidisciplinary research and team science is highly valued even though it **may result in 'middle' authorship**, as long as the faculty member's **unique contribution can be discerned**."

Process of Evaluating Team Science

- Guidelines for **documentation of candidate's contributions/roles/effort** (e.g., Annotating bibliographies and CVs, written statements, letters from colleagues, co-authors that describe contributions) (16)
- Sample materials provided (e.g., letter templates, CVs, candidate statements) (3)
- General guidelines for evaluating Team Science (4)
- Guidelines for the review process/committee (2)
- Source of evidence
  - Candidate (12)
  - Collaborators (12)
  - Superiors (8)
  - External referees/leaders in the field (7)
  - Published acknowledgments (1)

Process of Evaluating Team Science

"In order to clearly identify an investigators role in interdisciplinary research, **annotation of the bibliography**, in which the faculty member clearly describes his/her contribution to the work, is critical. **Letters from other members** of the research group can be used to **identify unique contributions** of the investigator, and to indicate the level of contributions, on the spectrum **from marginal to substantial**. Those letters would serve as supportive documents for the dossier, but would not replace the required independent review by outside neutral evaluators"

Discussion

- Most identified **traditional P&T criteria** that are not specific to team science, e.g. leadership, creativity, originality
  - Indicators of these criteria were likewise traditional, with some minor modifications, e.g.,
    - Co-authorship (e.g., middle authorship with evidence of "significant" role)
    - PI or co-PI on a grant (e.g., credit for leadership on separately scored section of grant)

- Only a handful offered **non-traditional P&T criteria** meant to capture contributions unique to the team science process, but these were vague, e.g.,
    - Critical importance to team building and teamwork
    - Essential to the team
    - Unique contributions to team productivity
  - Indicators for these criteria were lacking. Reliance on written statements by candidates and collaborators.

Discussion

" ...The College values the contributions of collaborators who clearly demonstrate their **critical importance to teambuilding and successful teamwork**. Those individuals will merit recognition whether their participation is as a principal investigator, co-principal investigator, or co-investigator. ...**Committee invites and welcomes evidence of collaboration** ..."

What's missing?

- Clarity of terms
  - "interdisciplinary research team science"
  - "collaborative, multi-disciplinary research and team science"
- Depth of criteria in P&T policies/guidelines
  - Most only included one or two criteria or strategies for evaluating collaboration
- Criteria including scientific activities and team process unique to collaborative research, as well as indicators of valuable contributions to these activities and processes

What we want are unambiguous terms, with numerous, clear criteria, objective metrics and/or explicit strategies for demonstrating meaningful factors related to advancing science in a collaborative context.

Do we have what we are looking for?

Battier Effect
(Daryl Morey, Rockets GM)

"His greatness is not marked in the box scores or at slam-dunk contests, but on the court **Shane Battier makes his team better**, often much better and his opponents worse often much worse."

New York Times, Feb 15, 2009

How much is basketball like science?

- "There is a tension, peculiar to basketball, **between the interests of the team and the interests of the individual**. The game continually tempts the people who play it to do things that are not in the interest of the group."

- "We think about this deeply whenever we're talking about **contractual incentives**... We **don't want to incent a guy to do things that hurt the team**" — and the amazing thing about basketball is how easy this is to do.

- "**They all maximize what they think they're being paid for**," he says. He laughs. "It's a tough environment for a player now because you have a lot of teams starting to think differently. They've got to rethink how they're getting paid."

New York Times, Feb 15, 2009

Recommendations for the SciTS Field

- Codify, develop, and disseminate the evidence base about how individual researchers most effectively meet **scientific benchmarks in the team context.**
  - Identify factors that are essential and unique to collaborative science (e.g., what are the "Shane's" doing that enhance the team)

- Translate these findings into **actionable criteria** that can be used to assess individuals' contributions to collaborative science.
  - Doing so will also help identify **sources of evidence** for dossier preparation.

- **Education and outreach to academic institutions** to increase and enhance recognition of team-based research in their P&T policies.

P&T Project Collaborators

- This project is part of a collaboration of the following:
  - Amanda Banacki (Catholic University)
  - L. Michelle Bennett (National Institutes of Health)
  - Holly Falk-Krzesinski (Elsevier)
  - Howard Gadlin (National Institutes of Health)
  - Kara Hall (National Cancer Institute)
  - Candy Ku (Apple - formerly at Stanford)
  - Julie Thompson Klein (Wayne State University)
  - Amanda Vogel (Leidos Biomed)