Team Science: Basic Principles

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IPPCR
March 25 12, 2013
What Brought Us Here?

• Interested in:
  – Conflict and how to resolve it
  – Implementing strategies for avoiding conflict
  – Understanding what makes great collaborations and teams successful
  – Sharing those elements that contribute to successful participation in and leadership of collaborations and multidisciplinary research teams
Part 1

• What is a Team?
• Trust
• Vision
• Expectations
• Team Development
What is a Scientific Research Team?

…..think of it as a continuum…..

**Level of Interaction and Integration**

<table>
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<th>Low</th>
<th>High</th>
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**Investigator-initiated research**

Investigator works on a scientific problem – largely on his or her own.

**Research Collaboration**

- Group works on a scientific problem, each bringing some expertise to the problem.
- Each member works on a separate part, which are integrated at the end.
- The interaction of the lead investigators varies from limited to frequent with regard to data sharing or brainstorming.

**Integrated Research Team**

- Team works on a research problem with each member bringing specific expertise to the table.
- There are regular meetings and discussions of the team’s overall goals, objectives of the individuals on the team, data sharing, and next steps.
- One person takes the lead while other members have key leadership roles in achieving the goal.
Pulling Many Elements Together

• Trust
• Membership (Building a Team)
• Shared Vision
• Getting and Sharing Credit
• Conflict Resolution
• Adversarial Collaboration
• Communication and Negotiation
• Team Dynamics
• Team Networks and Surrounding Systems
• Challenges to the Success of Scientific Teams
• Fun
• Leadership
Gee, Isn’t this pretty fundamental? I mean ... isn’t it pretty obvious?
The Science Process

Institutional Support

Power

Trust

Sharing Credit and Resources

Funding

Communication
The Learning Organization

When you ask people about what it is like being part of a great team, what is most striking is the meaningfulness of the experience. People talk about being part of something larger than themselves, of being connected, of being generative. It become quite clear that, for many, their experiences as part of truly great teams stand out as singular periods of life lived to the fullest. Some spend the rest of their lives looking for ways to recapture that spirit.

TODAY YOU'LL LEARN HOW TO WORK INDEPENDENTLY.

IN THIS EXERCISE, I WANT YOU TO PUT YOUR ARMS AT YOUR SIDE, CLOSE YOUR EYES, AND FALL BACKWARD.

AND IT'S STILL BETTER THAN WORKING WITH OTHER PEOPLE.

THUD
THUD
THUD
Collaboration Introduces Threats

- **High Interaction and Integration**
- **Multiple Interdependent Leaders**

- **Group-Identity vs. Self-Identity**
  - Independent
  - Interdependent

- **Status**, **Power**, **Autonomy**
Trust
Types of Trust

• *Calculus based trust* – built on calculations of the relative rewards for trusting or losses for not trusting

• *Identity based trust* – built on an assumption of perceived compatibility of values, common goals, emotional/intellectual connection

• *Competence based trust* – built on the confidence in people’s skills and abilities, allowing them to make decisions and train others
Trust and the Team

- Trust goes hand-in-hand with your scientific confidence in the results generated by your:
  - Postdoc, Collaborator, Colleagues, etc...
- If trust is never established or damaged once formed...confidence will slip
- The relationship itself drives your perception of other’s technical and intellectual abilities
Trust

• Share with a partner a time when you successfully built trust in a scientific setting
  – what lessons can you draw from this example?

• Share with a partner a time when trust was betrayed in a scientific setting
  – what happened? Could it have been prevented/preempted?
Vision
Developing a Shared Vision

• Everyone can describe the “big picture”
• Each team member can state his/her research goal and how it relates to the “bigger picture”
• Have the group discuss each members accomplishments and challenges in achieving the goal – and how they relate to the overall mission
• Instill ownership of roles and responsibility for attaining goals
• Team accepts responsibility and accountability for both accomplishments and failures – without blaming.
Elevator Speech

• You are in the elevator with a member of your institution’s leadership who just acquired a 250K gift from a donor. She is looking for projects to fund and she asks you to explain the value of your project and the expected outcome.

• What do you say?
(you have 30 seconds)
Groups of Two

Person 1: Describe the Vision for your lab, group, team

Person 2: Restate what you heard
Setting Clear Expectations

Provides a scaffold for building deeper trust
There are no secrets or surprises and there is a strong platform for discussion

- Communication
- Regular Meetings with Clear Agendas
- Authorship
- Conduct of Investigation, Research…
- Technical Support
- Career Development
- Evaluation Criteria, etc.…
Tools for Setting Expectations

• Prenuptial (Collaborative) Agreement
  – Jointly created agreement among collaborators: can be formal or informal in its creation

• “Welcome Letter”
  – Provides a scaffold for building deeper trust including: what you can expect of me, what I expect of you, what to do if we disagree

• Mack Truck Lists
  – Roles and responsibilities of every team member are clearly articulated, listed and shared with every other member of the team
Prenuptials for Scientists: Collaborative Research Agreements

Categories to cover

• Goals of Collaboration
  o Including...when is the project “over”? 
• Who Will Do What?
  o Expectations, responsibility and accountability
• Authorship, Credit
  o Criteria, attribution, public comment, media, IP
• Contingencies and Communicating
  o What if ...? and Rules of engagement
• Conflict of Interest
  o How will you ID conflicts? And resolve them?
Model of Team Development

- Forming
- Storming
- Norming
- Performing
- Adjourning and Transforming

Bruce Tuckman, 1965, 1977
What does the team need?

- Shared Vision
- Mutually Reinforcing Activities – each participant’s actions fits into the larger whole
- Continuous Communication
- Backbone Support – infrastructure for support including dedicated staff and clear processes
- Measurement System – agreement on what data will be collected and how it will be measured

Kania and Kramer, Collective Impact
Psychological Safety

• Principles for open and honest discussion:
  – All input is valuable
  – Any team-member can challenge an assertion
  – Any team member can raise an issue or concern
  – Every team-member is allowed to express his attitudes, desires and needs
  – No speaker should be prevented from expressing himself
  – All team-members agree to participate actively when they have the information to do so

Adapted from The Ideal Speech Situation - Jürgen Habermas
Model of Team Development

Adjourning and Transforming

Forming

Performing

Norming

Threats:
- Power
- Status
- Autonomy

Challenges:
- trust, personality styles, style under stress, style in conflict, competition for power, autonomy, status, language, culture, and poor listening

Bruce Tuckman, 1965, 1977
Part 2

• Promoting Creative Disagreement
• Diversity
• Mentoring
Productive Collision

Contain Affective/Personal Conflict

Share Perspectives/Invite Disagreement
Two Types of Conflict

What is *cognitive* conflict?

- Disagreement about ideas and approaches
- Issue-focused, not personal
- Characteristic of high performing groups

What is *affective* conflict?

- Personal antagonism fueled by differences of opinion
- Shifts ideas from the focus to the person
- Fosters defensiveness
- Destructive to group performance and cohesion

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<tr>
<th>Debate</th>
<th>Dialogue</th>
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<tbody>
<tr>
<td>Assuming that there is a right answer, and that you have it</td>
<td>Assuming that many people have pieces of the answer</td>
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<tr>
<td>Combative: participants attempt to prove the other side wrong</td>
<td>Collaborative: participants work together toward common understanding</td>
</tr>
<tr>
<td>About winning</td>
<td>About exploring common ground</td>
</tr>
<tr>
<td>Listening to find flaws and make counter-arguments</td>
<td>Listening to understand, find meaning and agreement</td>
</tr>
<tr>
<td>Defending our own assumptions as truth</td>
<td>Revealing our assumptions for reevaluation</td>
</tr>
<tr>
<td>Seeing two sides of an issue</td>
<td>Seeing all sides of an issue</td>
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<tr>
<td>Defending one's own views against those of others</td>
<td>Admitting that others' thinking can improve one's own.</td>
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<tr>
<td>Searching for flaws and weaknesses in others' positions</td>
<td>Searching for strengths and value in others' positions</td>
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<tr>
<td>By creating a winner and a loser, discouraging further discussion</td>
<td>Keeping the topic even after the discussion formally ends</td>
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<tr>
<td>Seeking a conclusion or vote that ratifies your position</td>
<td>Discovering new options, not seeking closure</td>
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from Leading through Conflict: How Successful Leaders Transform Differences into Opportunities by Mark Gerzon
What is Expected from a Collaborator?

What did you say?
The Value of Diversity

• “Diversity it about the importance of having many different elements in the mix, many different experiences, many different perspectives, many different skills.”

• “Innovation – once the solitary pursuit of genius – has become a collaborative enterprise, understandably, since the types of problems we must address these days are too complex for one or two or three people, or a whole lab, or even the resources of an entire company.”

Innovation and Diversity by Irving Wladowdky-Berger, Innovation America, (www.innovation-america.org)
Managing Diversity: Identity Differences

• Styles – expressions and interactions
• Norms – communication, assertiveness
• Values – principles, what matters
• Cognitive framework – how the world is seen

When group members share common goals and values cultural diversity leads to better outcomes regarding group cohesiveness and group performance
Diversity of Cultures
Physicians vs Basic Scientists

• Need for immediate action vs avoiding a rush to judgment
• Adherence to standards of practice vs encouragement to challenge existing paradigms
• Respect for hierarchy and expert authority vs encouragement to critique accepted wisdom
• Errors as mortal threats vs inevitable manifestations of the creative process
• Application of sci knowledge vs discovery of...
• Focus on unique vs focus on common
• Uncontrollable studies vs controllable studies
• Commitment to the physician's oath vs commitment to the search for truth
• Suits and ties vs jeans and t-shirts
• Perceptions and frames of reference

Managing Diversity: Harnessing Differences

• Essential Differences – disciplinary world-views, methodologies, technologies, criteria for credit and authorship.
  ✓ Require integration

• Incidental Differences – personality styles, work habits, identity factors – race, gender, etc.
  ✓ Require effective management but depends on degree of scientific integration
Diversity and a Tech Team

- Technology development is for “everyone”
- If tech teams aren’t diverse, innovation is at risk
- Diverse perspectives are critical
- Consider HP’s recent fiasco with regard to its facial recognition software
- Diversifying tech teams makes stronger products as well as strategies to recruit diverse techies

Facial Recognition and HP
Managing Up and Across

- Communication
- No Surprises
- Provide solutions – not problems
- Be honest and trustworthy
- Be loyal and committed
- Understand your boss’s/colleague’s preferences
- Understand your own preferences
- Use the strengths of others
- Recognize the boss/colleague’s weaknesses
- Know what the hot button issues and pet peeves are
- Request feedback – (and learn to accept it)
- Do not go over the boss’s head or behind his/her back
There is No Formula for the Perfect Mentor
Mentees Want Different Things

• Help
• Guidance
• Insights
• To be challenged
• To learn the secrets
• Brainstorming partner
• Oral presentation skills
• ...

• Introductions to others
• Someone to help identify opportunities to present
• Grant writing skills
• Collaboration skills
• To be directed
• ...

Defining a Mentoring Relationship

- Formal vs Informal
- Goal vs Topic/Task Driven
- Frequent vs Infrequent Meetings
- Degree/Level of Guidance
- Accountability (both sides)

- What does the Mentee want out of it?
- The Mentor?
Questions for Mentees

• What do you want out of a mentoring relationship?
• What goals have you set for yourself?
  – Long term? Short term? Where do you want to focus now?
• How do you learn best?
• How do you like to be challenged?
• How frequently do you want to meet?
  – What happens if one of us needs to cancel? If one of us does not show up for an appointment?
• Etc...?
Questions for Mentors

• How do you mentor best?
• What kind of mentoring arrangement do you prefer?
• For what kind of person are you a good mentor? A poor mentor?
• The next time you consider mentoring someone, would you be willing to sit down first to explore whether you are a good match?
• What kind of conversation would you have to determine if the relationship would be a good fit?
Promoting your Science – and Yourself

• Develop your “elevator ride” speech of your accomplishments
• Send a weekly or monthly update of your accomplishments to your supervisor.
• Self-nominate for awards. Share knowledge about the technologies or approaches in which your lab specializes.
• Practice sharing your accomplishments in the context of a story that might weave together a few elements.
• Find out what the leadership is trying to accomplish.
• Tell leadership what you want.
Part 3

• Managing Conflict
Difficult Conversations
How can you put the difficult issues on the table for discussion?

• Difficult conversations challenge something about the way we see ourselves or the way we want to be seen.

“We don’t see things as they are, we see them as we are.”

— Anais Nin
Each difficult conversation is really three

• The “what happened?” conversation
  – truth, intentions and blame

• The “feelings” conversation
  – feelings are an intrinsic part of difficult conversations

• The “identity” conversation
  – Am I competent? Am I a good person? Am I worthy of recognition for my efforts?
Step 1: Planning

• Before starting the difficult conversation determine
  – What is your purpose in having this conversation? What do you hope to accomplish?
  – Is this the best way to address the issue and achieve your purpose?
  – Differentiate between attributing “blame” and understanding “contribution”
    • Blame looks backward
    • Understanding looks to the future
Step 2: Once the conversation begins

• Make clear what your purpose is
  – Start from the third story – the difference between your story and theirs
  – Incorporate both perspectives in the discussion
  – Invite the other to join as a partner in sorting out the situation
Step 3: Exploring the stories

• Try to figure out how your differences developed
  – Try to understand the other’s perspective
  – Acknowledge feelings about the issue
  – Share your viewpoint, intentions and feelings
Step 4: Problem Solving

• Try to develop some solutions to the problem
  – Invent options that meet each party’s most important concerns and interests
  – Identify standards for what should happen
  – Identify ways to keep communication open
Difficult Conversations

• Will get easier with practice
• Start small ... little “wins”
• Develop your personal approach/style and master it
• Start tackling the bigger stuff ... 

• Practice, practice, practice....
Still, no matter what type of collaboration...

Collaborative partners face difficulties:

- Poor listening and new language
- Conflicts over goals and methods to achieve them
- Squabbles about validity of conceptual frameworks
- Competition for influence, power, recognition, ...
- Threat to ego and/or status
- Inability to integrate diverse perspectives
- Institutional disincentives—stress disciplinary competence vs. out-of-box thinking
- Difficulty finding funding and publication outlets
Finding Your Sweet Spot

**Essential Work**
Division Priorities and Objectives

**Passions**
Tasks that Engage the Mind and Spirit

**Strengths**
Competencies and Expertise

**The Sweet Spot**
- Where personal strengths and passions align with essential work in a setting which provides opportunities for challenge and growth.
- Where individuals are the most valued and their contributions most valuable.

Maximize the Value of each Individual:
Aim to increase the overlap among these three circles, while keeping in mind the changing contents within each circle.
"I make a pretty good team!"
Sharing Credit

• Samantha Levine-Finley
  – Associate Ombudsman, NIH OD

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