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Recommended Citation
Carothers, Bobbi J.; Luke, Douglas A.; Moreland-Russell, Sarah; Sarli, Cathy C.; and Evanoff, Bradley A., "Using social network analysis to evaluate changes in transdisciplinary collaboration during a Clinical and Translational Science Award." Institute for Public Health, Fifth Annual Conference, St. Louis, MO. 2012. Paper 33.
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# Using Social Network Analysis to Evaluate Changes in Interdisciplinary Collaboration during a Clinical and Translational Science Award

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## BACKGROUND

Washington University in St. Louis was granted a Clinical and Translational Science Award (CTSA) in 2007 and consequently formed the Institute of Clinical and Translational Sciences (ICTS). One of the aims of the institute was to provide the infrastructure needed for interdisciplinary research. To evaluate success toward meeting this objective, the evaluation team utilized social network analysis to assess collaboration patterns in research productivity including grant development and publications.

Hypothesis: Both overall and interdisciplinary collaborations were expected to increase over time.

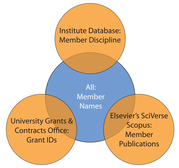
## METHODS

### Participants

387 members who joined the institute in its first year (2007) to examine the longest period of follow-up.

### Measures/Analysis

#### Data Sources




Social network analysis was used to examine collaboration between ICTS members on grants and publications. Members were linked if they worked on the same grant or were authors on the same paper for a single year.

A collaboration was considered intradisciplinary if both members were from the same discipline, and considered interdisciplinary if they were from different disciplines.

Collaboration activity from 2007 (before the award) was compared with 2010 patterns.

## RESULTS

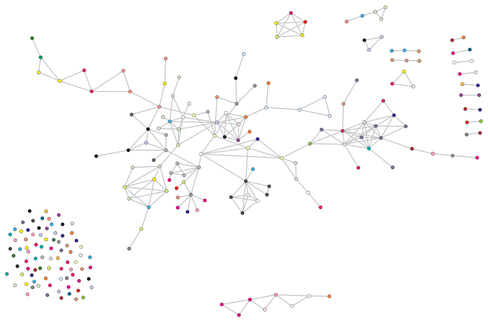
- The average number of collaborators per member for both grants and publications increased over three years of the grant period.
- Collaboration for both grants and publications became more interdisciplinary (color indicates discipline).
- Greater collaboration is demonstrated by the increased number of links between members and fewer members working in isolation from 2007 and 2010 for both grants and publications.

### Grant Networks

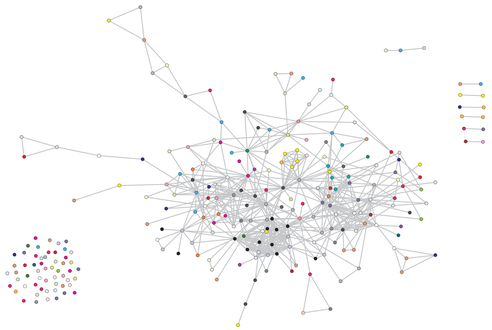
| Year | # Members | Average # Collaborators | Inter- to Intra-disciplinary Collaboration Ratio |
|---|---|---|---|
| 2007 | 236 | 1.92 | .216 |
| 2010 | 257 | 4.81 | .436 |

102% Increase

2007



2010

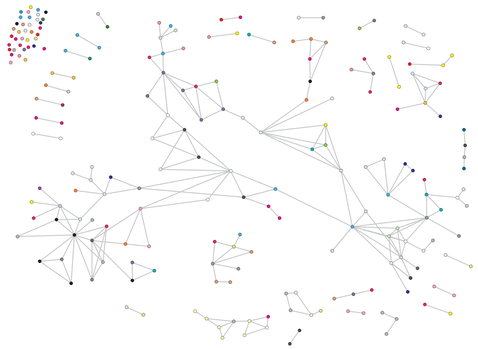


### Publication Networks

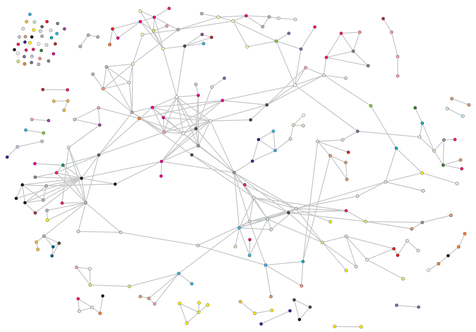
| Year | # Members | Average # Collaborators | Inter- to Intra-disciplinary Collaboration Ratio |
|---|---|---|---|
| 2007 | 221 | 2.02 | .191 |
| 2010 | 256 | 2.64 | .230 |

20% Increase

2007



2010



## DISCUSSION

Social network analysis can provide objective indicators of collaboration necessary for demonstrating the value of a CTSA at an academic institution. In this case, an increase in total collaboration and interdisciplinary collaboration was more apparent at the grant stage than the publication stage. Given the lag time between grant submission and resulting publications, a delayed change in publication patterns is to be expected and should be more apparent at later intervals. Consistent results indicate that the ICTS aim of providing infrastructure for interdisciplinary research is being fulfilled.

Science of Team Science Conference
April 16, 2012, Chicago, IL

This work was made possible by Grant Number UL1 RR024992.

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