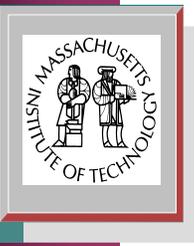


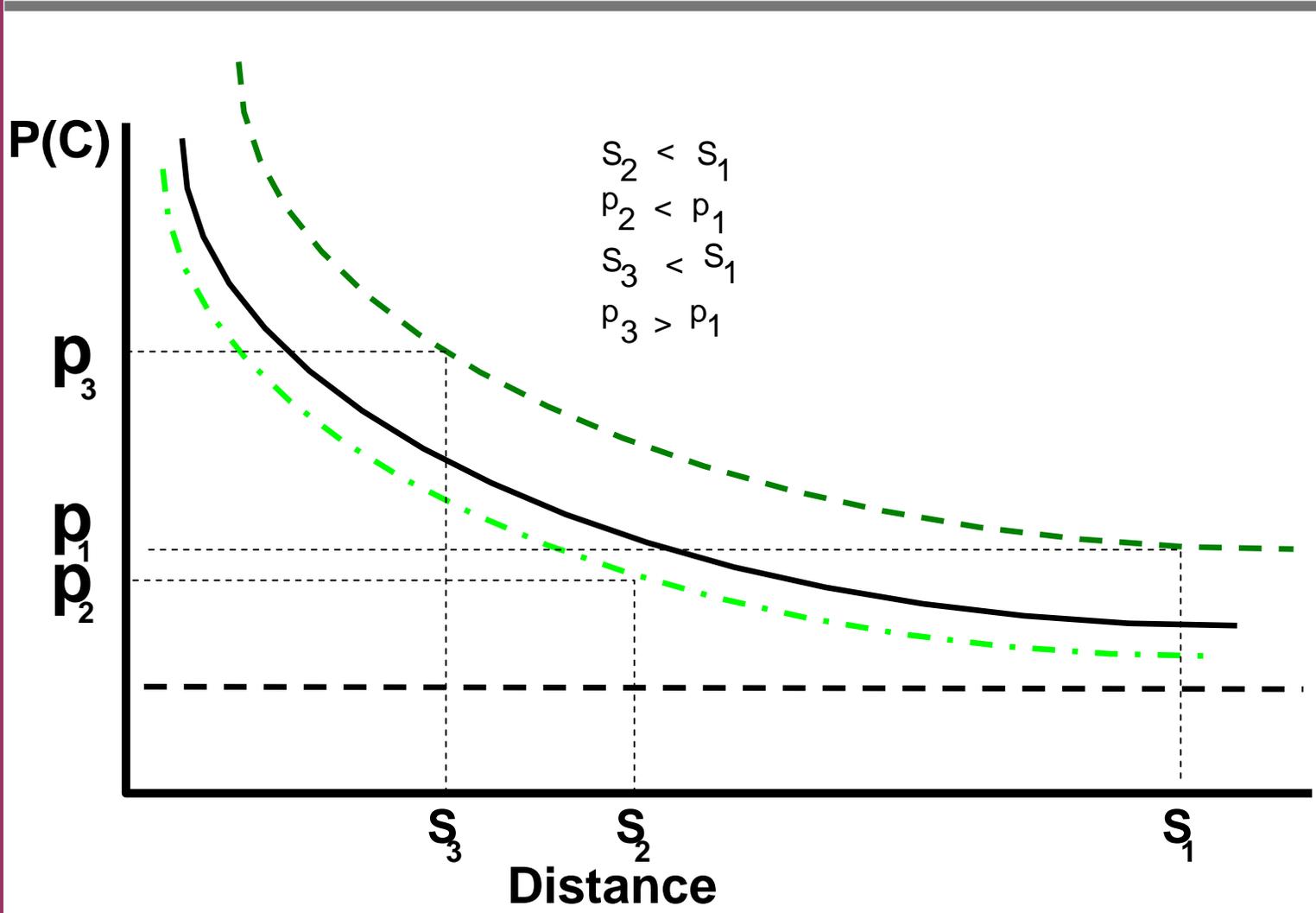


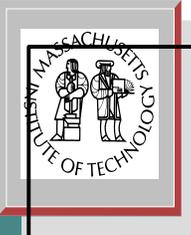
The Effects of Physical Location on Communication Patterns (Continued)

May 5, 2007

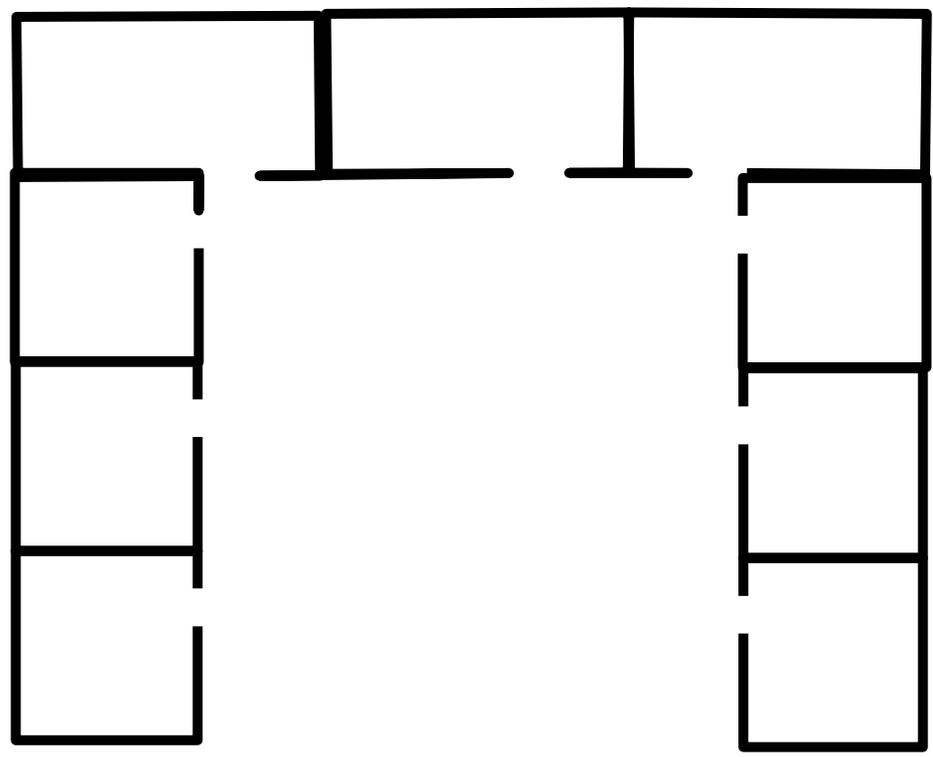


Some Obvious Points



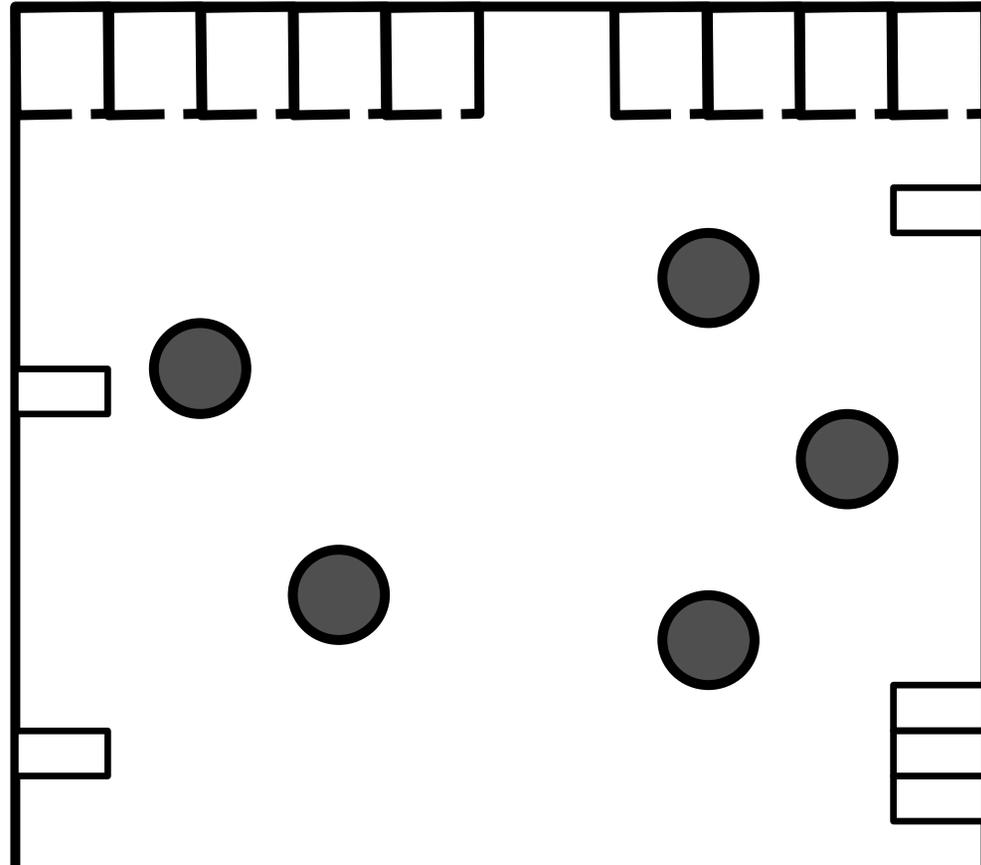


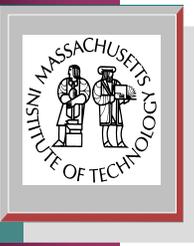
A Typical Grouping of Offices Around a Secretarial Area.



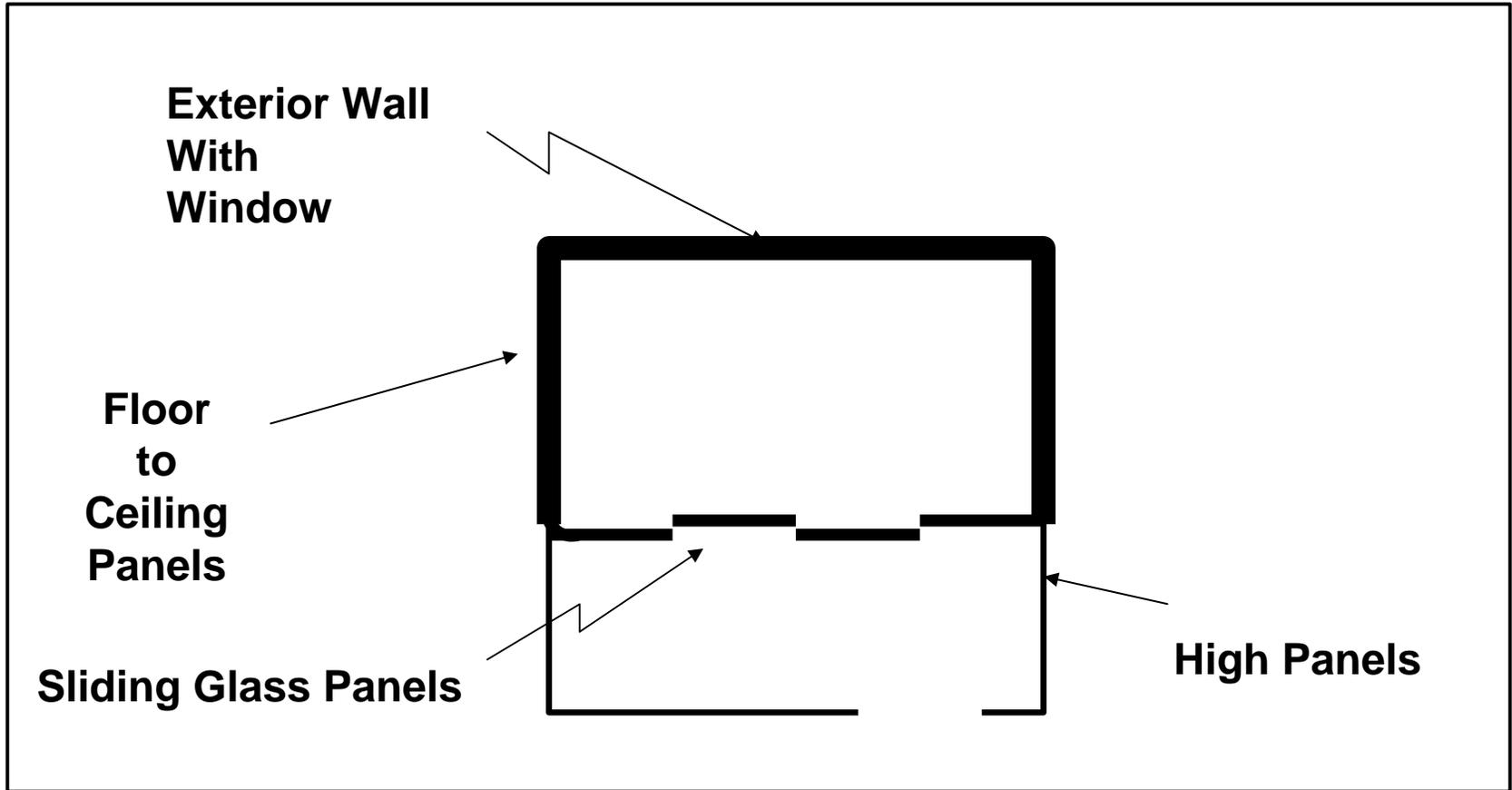


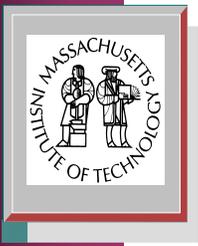
Same Area Converted to the 'Cave and Commons' Concept.





Office Configuration to Vary Privacy and Accessibility.





Combining Physical & Organizational Barriers & Bonds



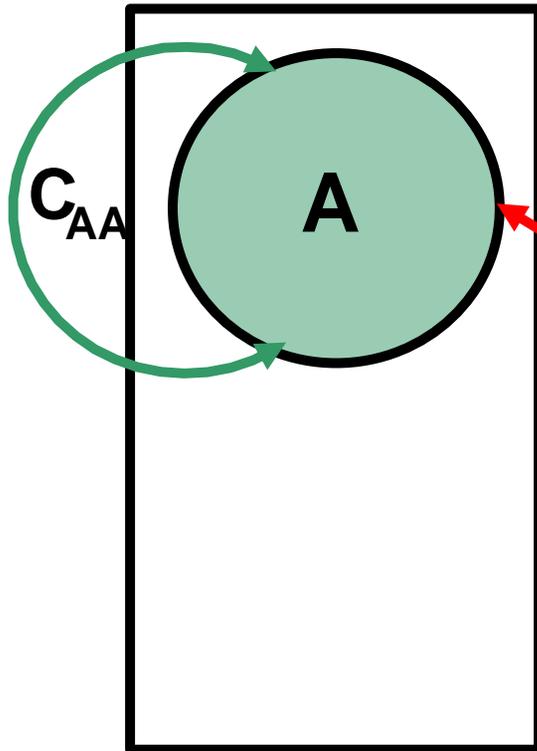
The Effects and Organizational Separation as Measured in One Organization

	DIFFERENT DEPARTMENTS AND PROJECTS	SAME DEPARTMENT DIFFERENT PROJECTS	SAME PROJECT DIFFERENT DEPARTMENTS	SAME DEPARTMENT AND PROJECT	
SAME WING	0.16	0.69	0.71	0.95	
SAME FLOOR DIFFERENT WINGS	0.05	0.53	0.80	—	
SAME BUILDING DIFFERENT FLOORS	0.05	0.60	—	—	
SAME SITE DIFFERENT BUILDINGS	0.02	0.35	0.33	0.50	
DIFFERENT SITES	0.002	0.15	0.23	0.38	

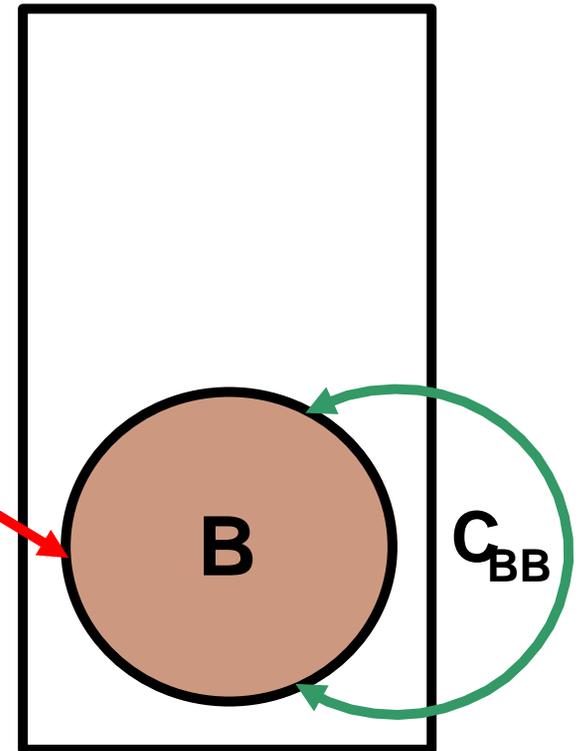


Two Departments in Separate Locations

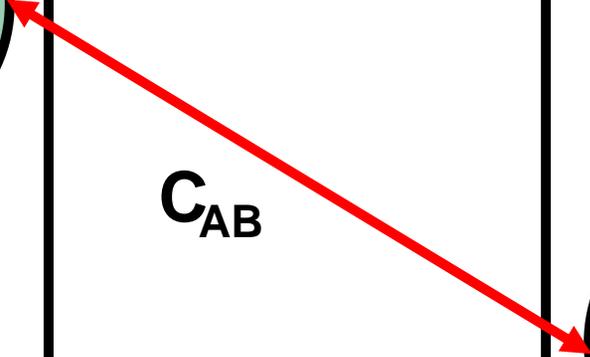
LOCATION I



LOCATION II

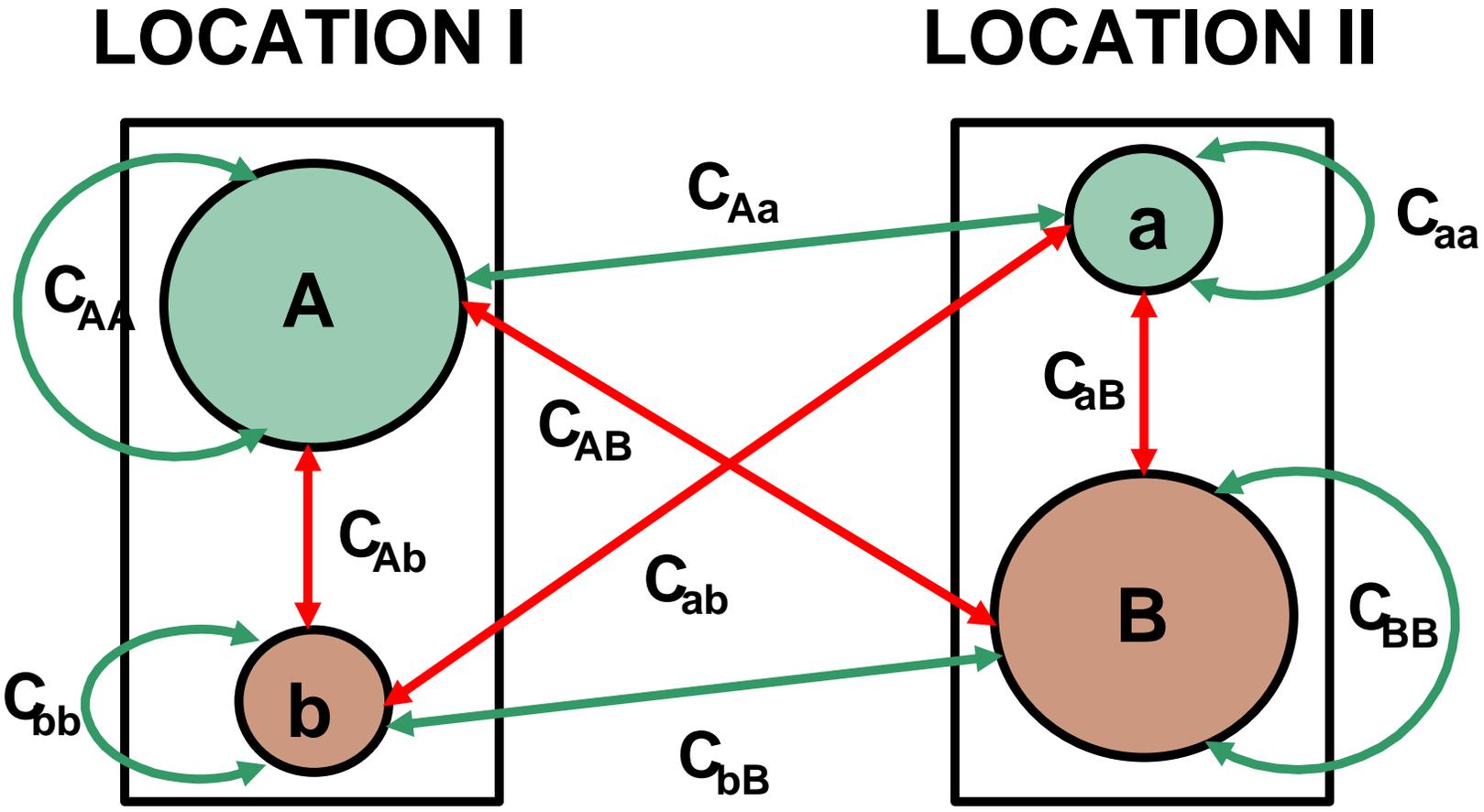


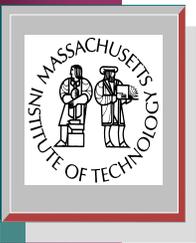
C_{AB}



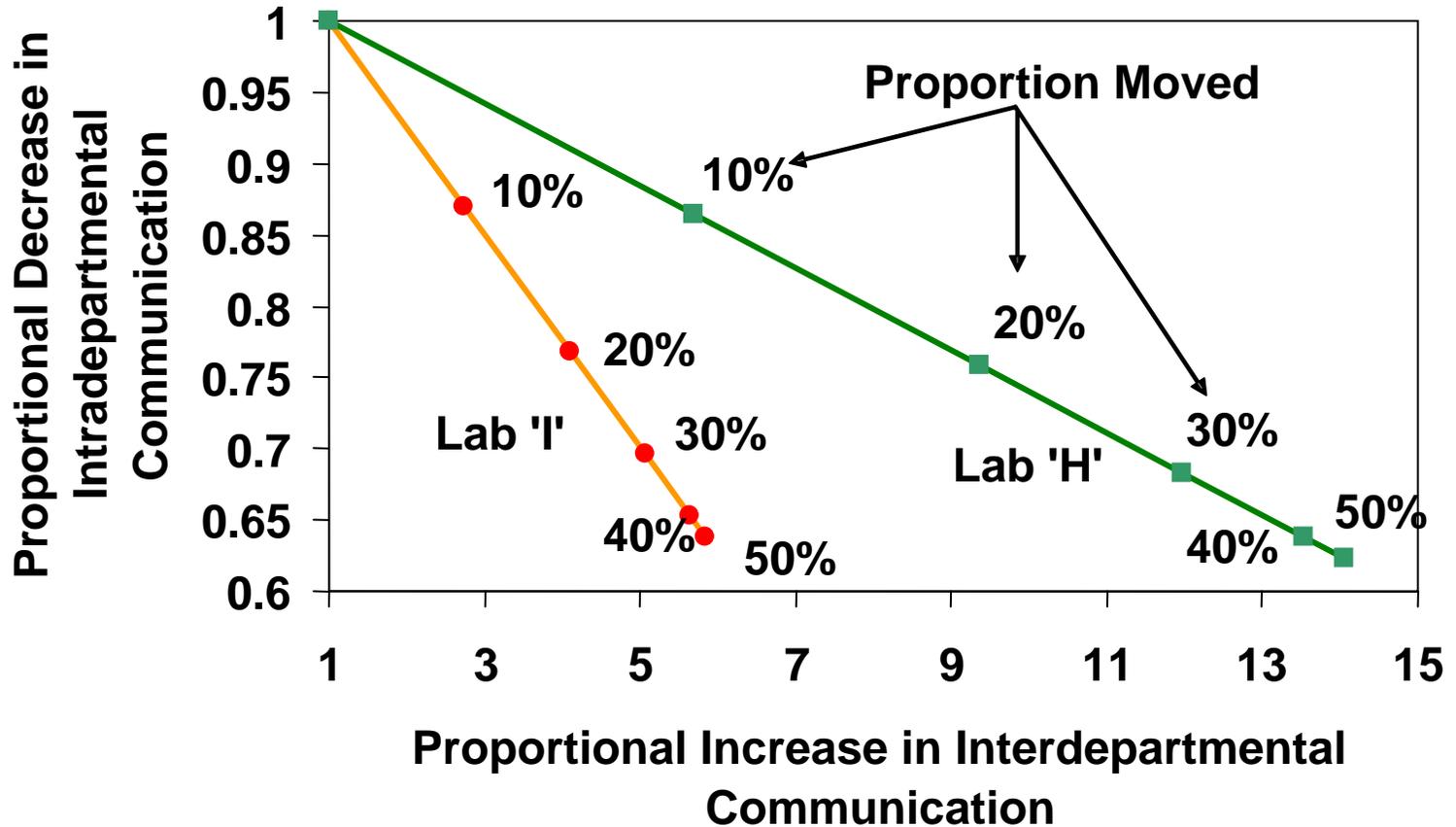


The Effect of Transferring Staff Between Locations



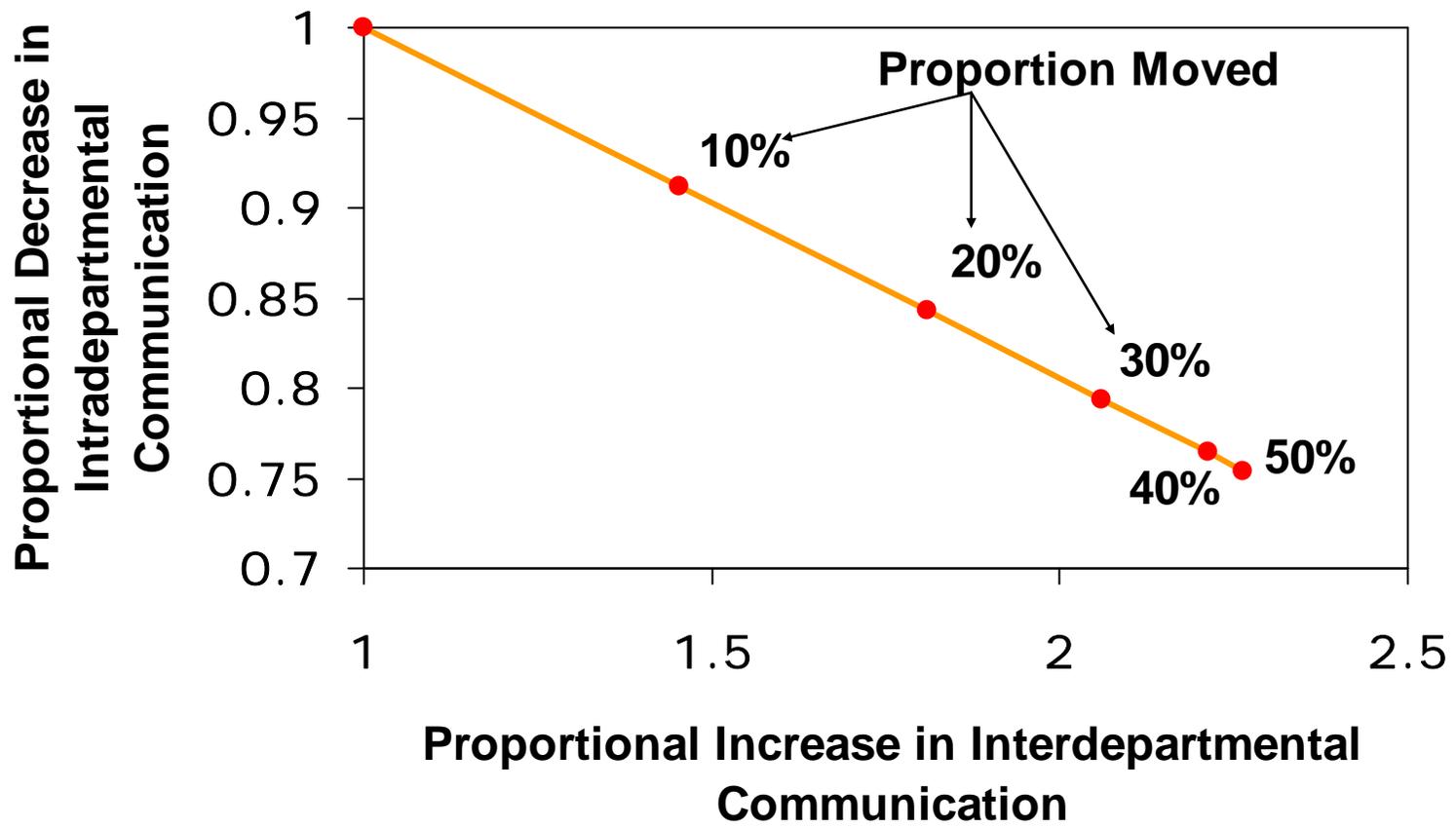


Moving Staff Between Sites to Increase Interdepartmental Communication (Examples from Laboratories 'H' & 'I')



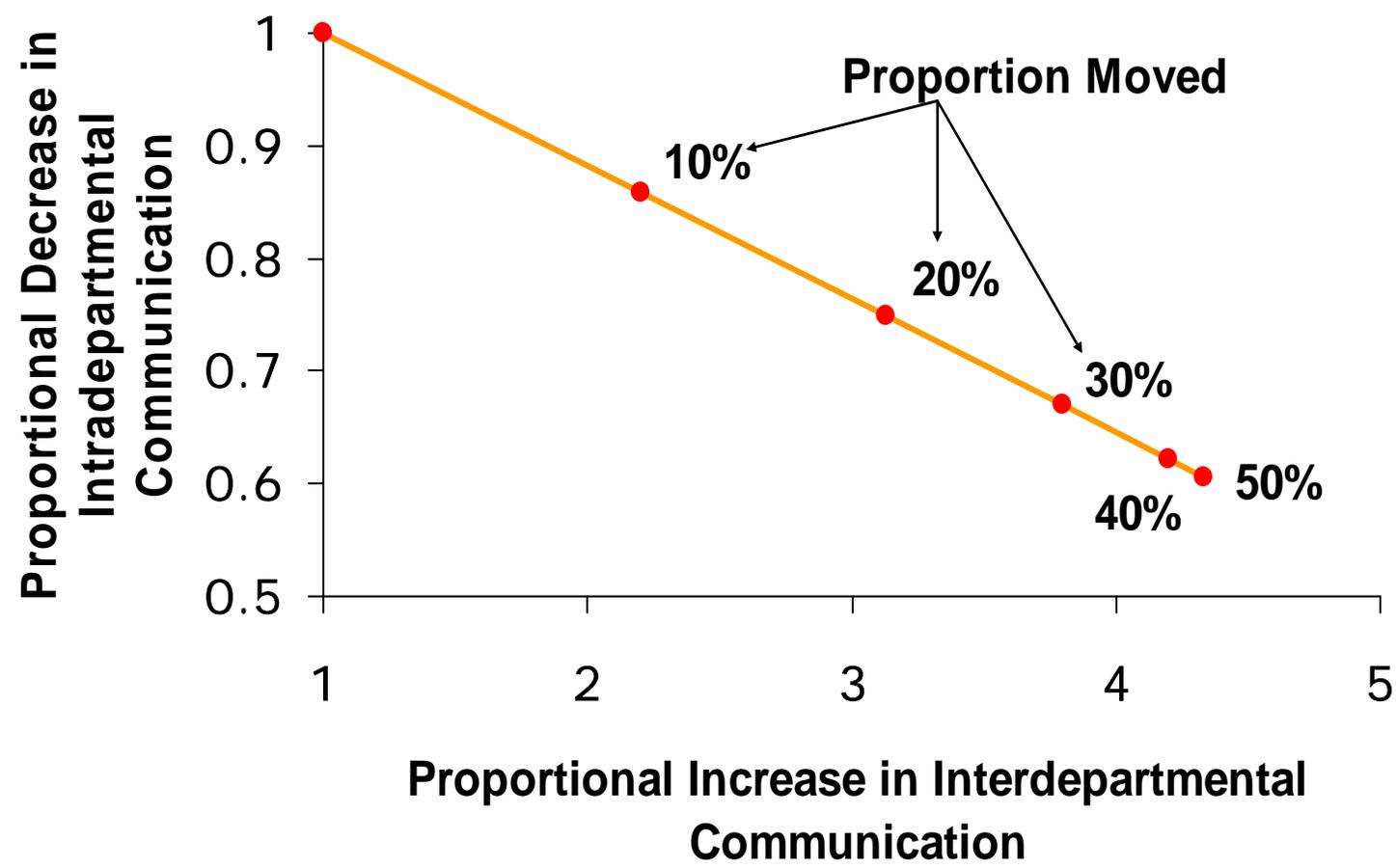


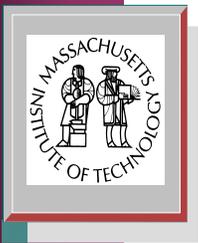
Moving Staff Between Buildings to Increase Interdepartmental Communication (An Example from Laboratory 'H')



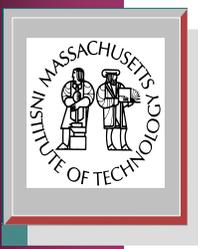


Moving Staff Between Floors of a Building to Increase Interdepartmental Communication (An Example from Laboratory 'I')



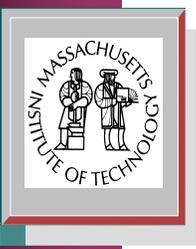


Communication Within a Biotech Cluster



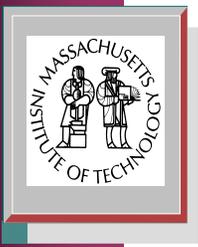
The Cambridge/Boston Biotechnology Cluster

- An extensive literature has developed in recent years arguing for the benefits of firms sharing a common technology to cluster geographically.
 - Aids in attracting specialized staff.
 - May attract venture capital, suppliers, support services, etc.
- Claims have also been made for the synergistic benefits of firms sharing scientific knowledge, especially if there are university laboratories near the cluster.
- Prior studies have inferred inter-firm communication from the evidence of co-publishing and co-patenting across firms, however, a good amount of scientific exchange may occur that does not appear in such publicly accessible records
 - No one has ever actually measured whether less formal scientific exchange across firms really occurs, to what degree what the actual dynamics look like and what the results are.



Earlier Research

- As discussed earlier, we developed a method for measuring the structure of scientific communication networks *within* firms.
- Why not adapt that method for the study of scientific communication *among* firms and other organizations.



Experimental and Control Groups

- Geographic limits of the cluster are defined in terms of location within a limited set of postal (Zip) code regions.
- Scientists reporting from similar Biotech firms outside of the postal code regions of the main study but within 100 km of Boston.
 - Comparative density of communication
 - Connections between the two groups
 - Connections with the universities and with local 'Big Pharma' companies.



Communication in The Biotech Cluster

Length of connecting links is *inversely* proportional to the amount of communication reported.

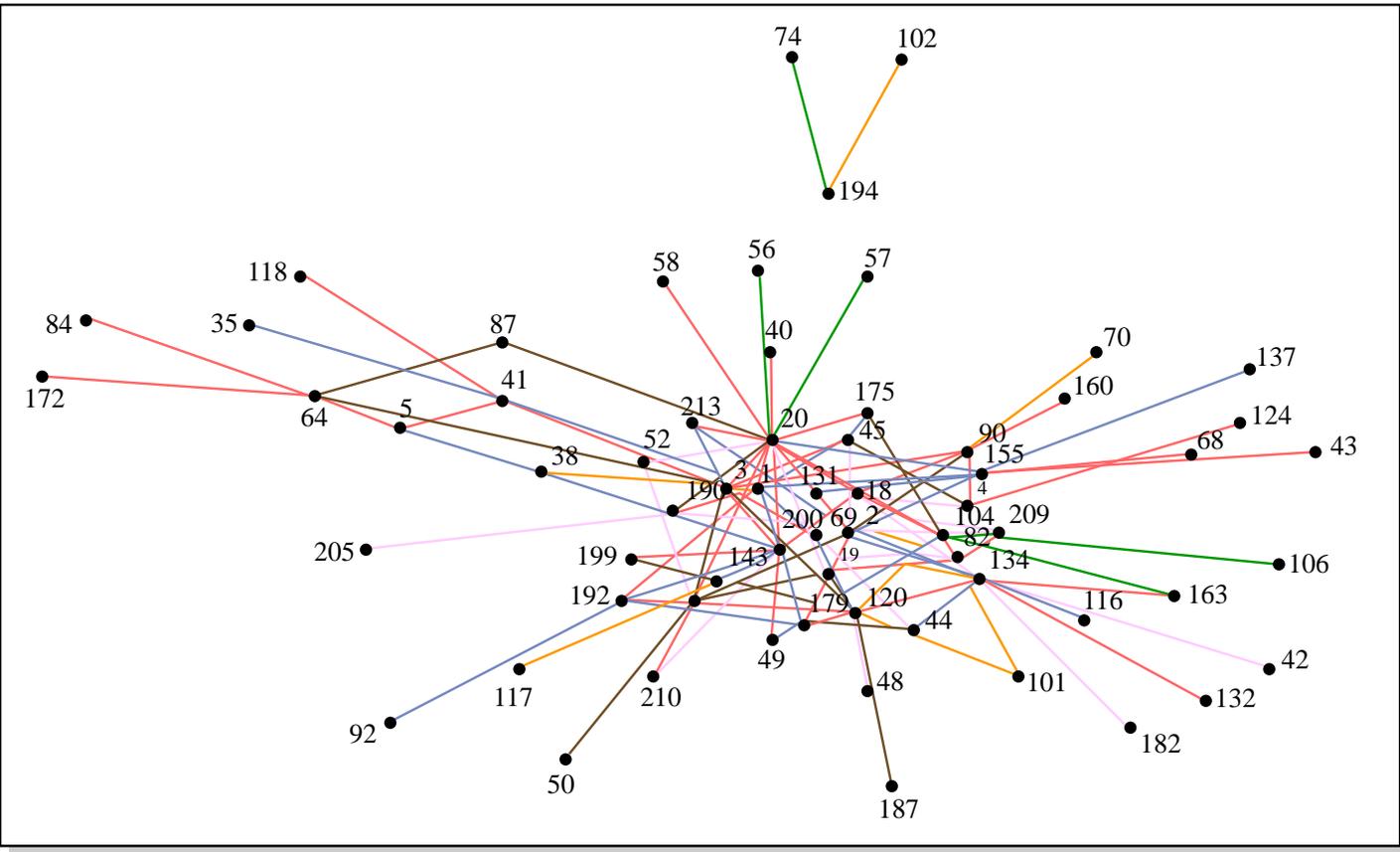
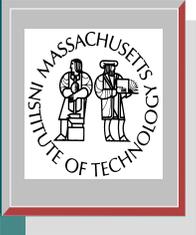


Figure by MIT OCW.



A Super Cluster?

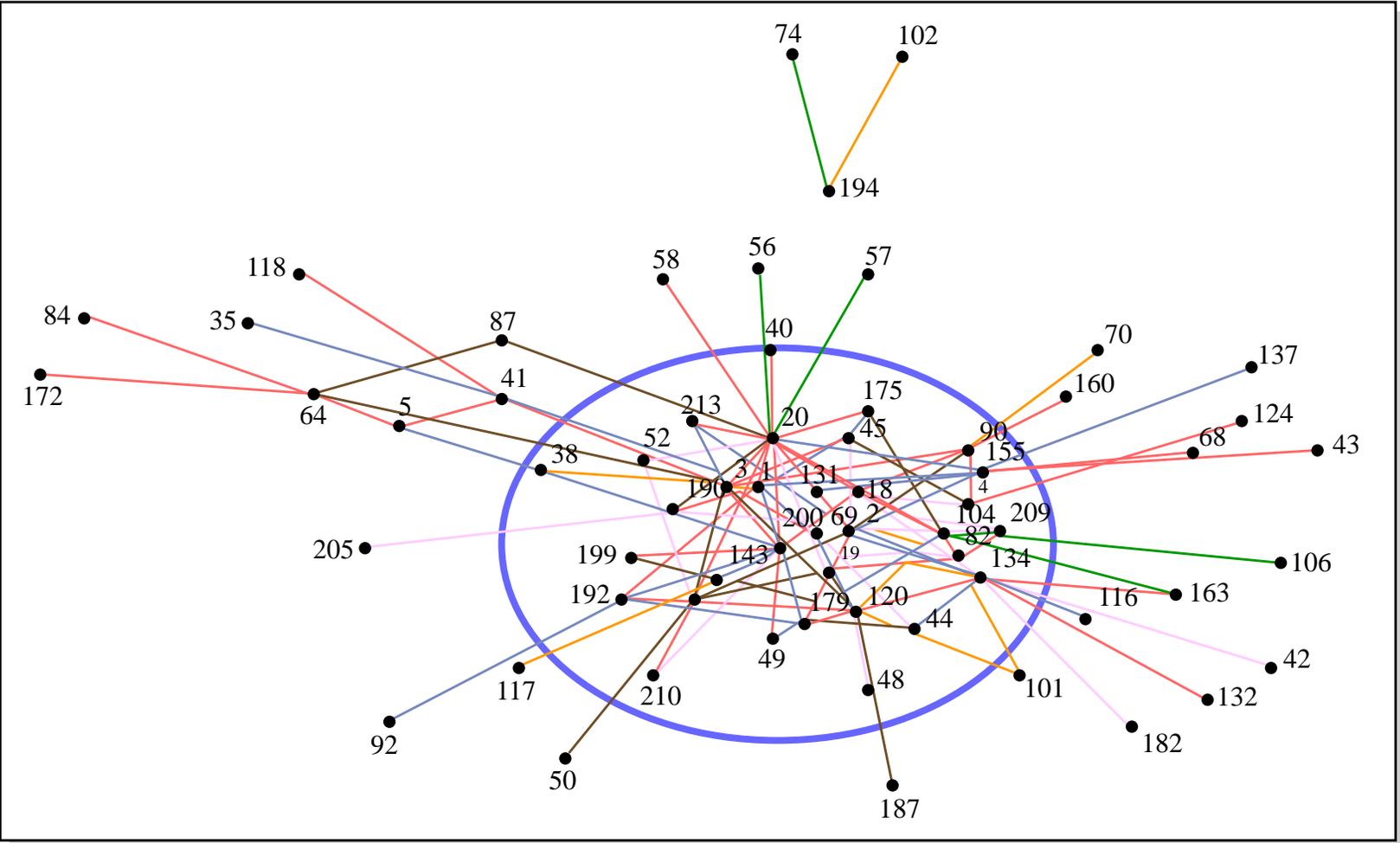


Figure by MIT OCW.



Inside The Super Cluster

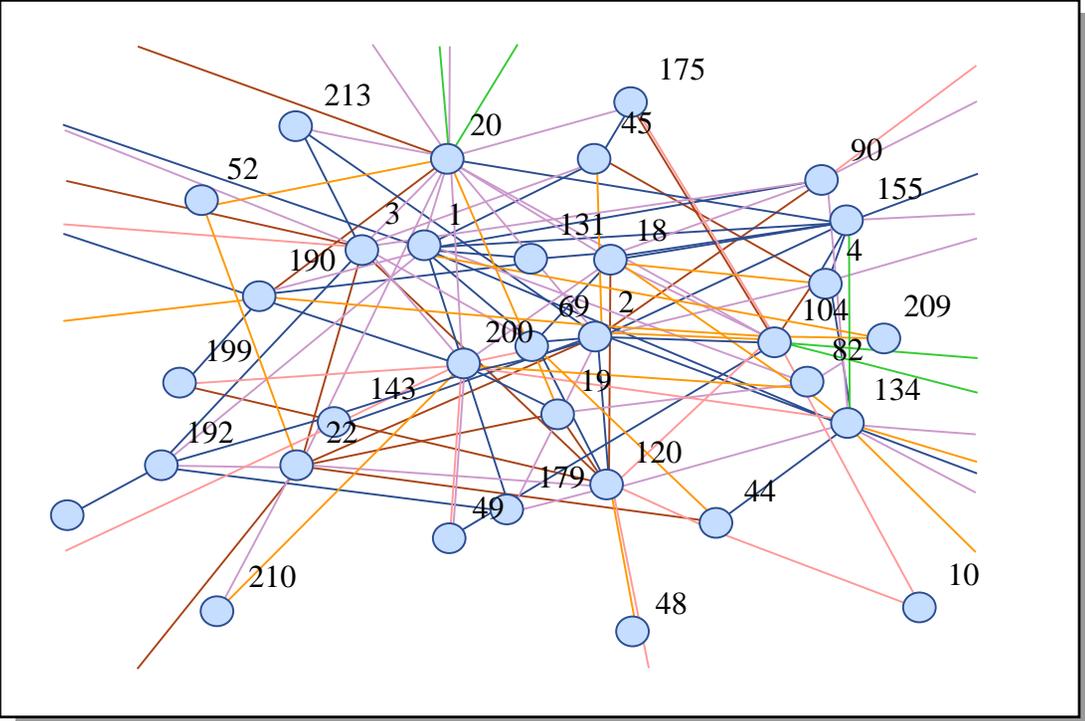
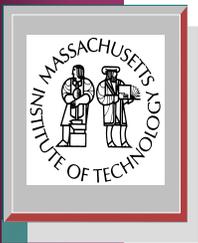
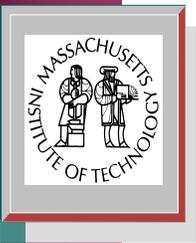


Figure by MIT OCW.



Where are the Universities?



Universities

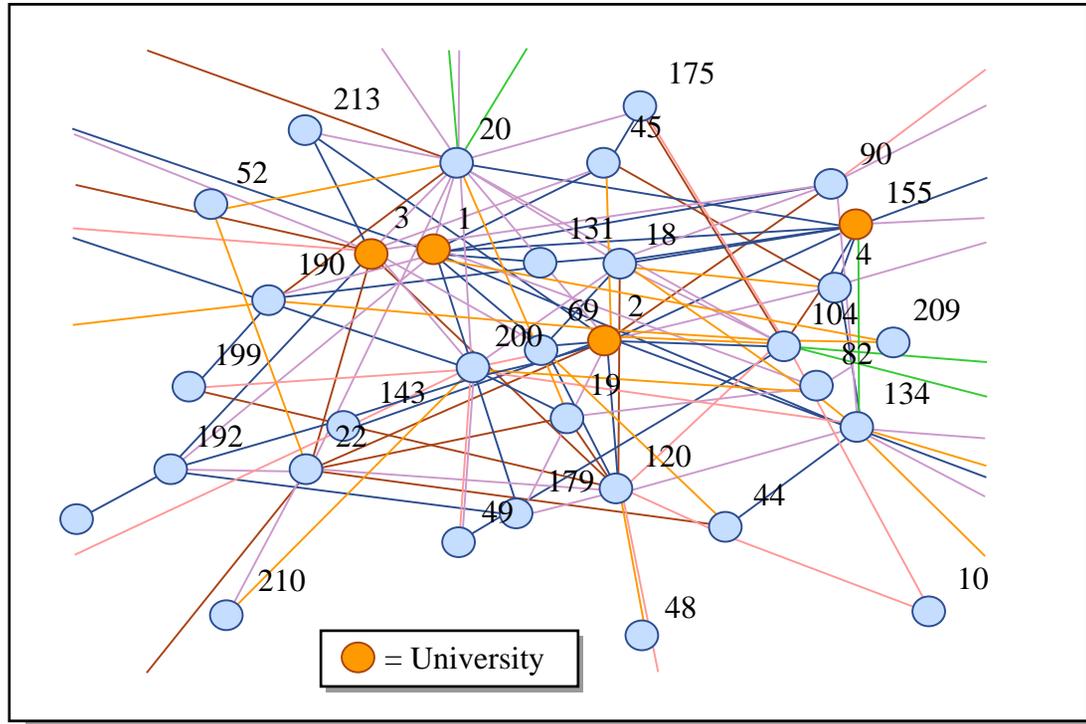
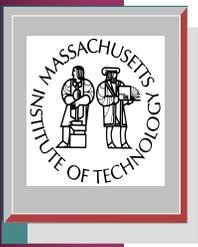


Figure by MIT OCW.

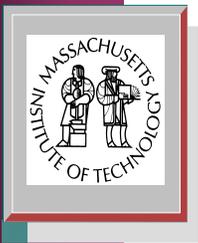


What About 'Big Pharma'?

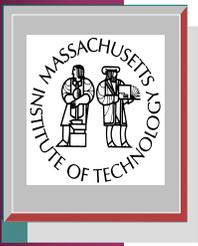


The Major Pharmaceutical Firms

- A number of 'Big Pharma' companies have located R&D operations in the region.
 - Their purpose, obviously is to tap into the network.
 - Search to license candidates for their new product pipeline.
 - Search for potential acquisitions.
 - Are they successful in joining the network?



Where is 'Big Bio'?



Large Bio Firms

- Some of the Biotech firms have grown quite large.
 - How do they fit into the network now?



'Big Bio'

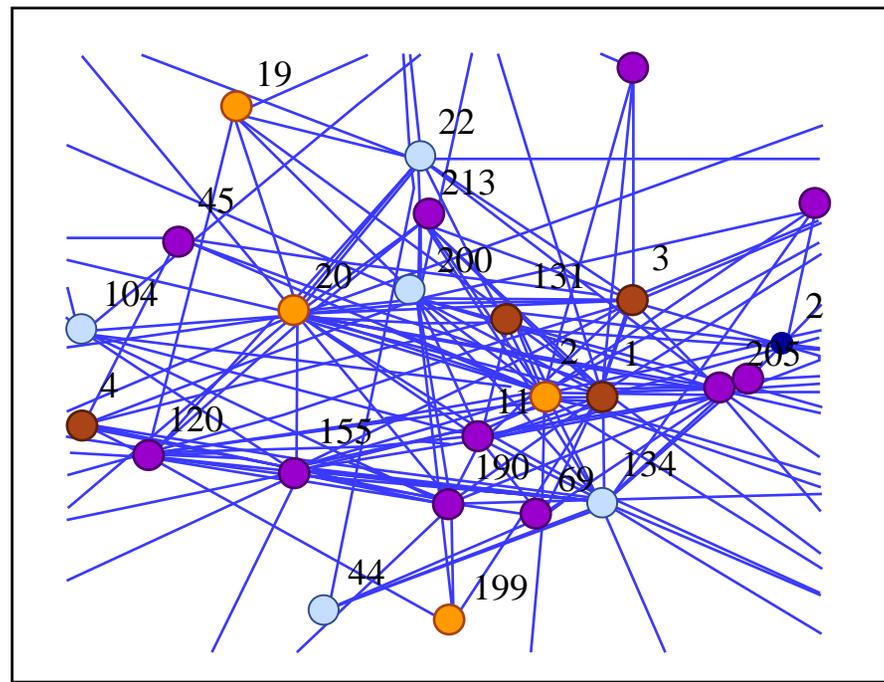
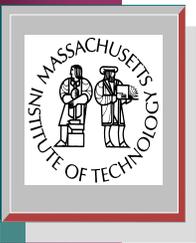
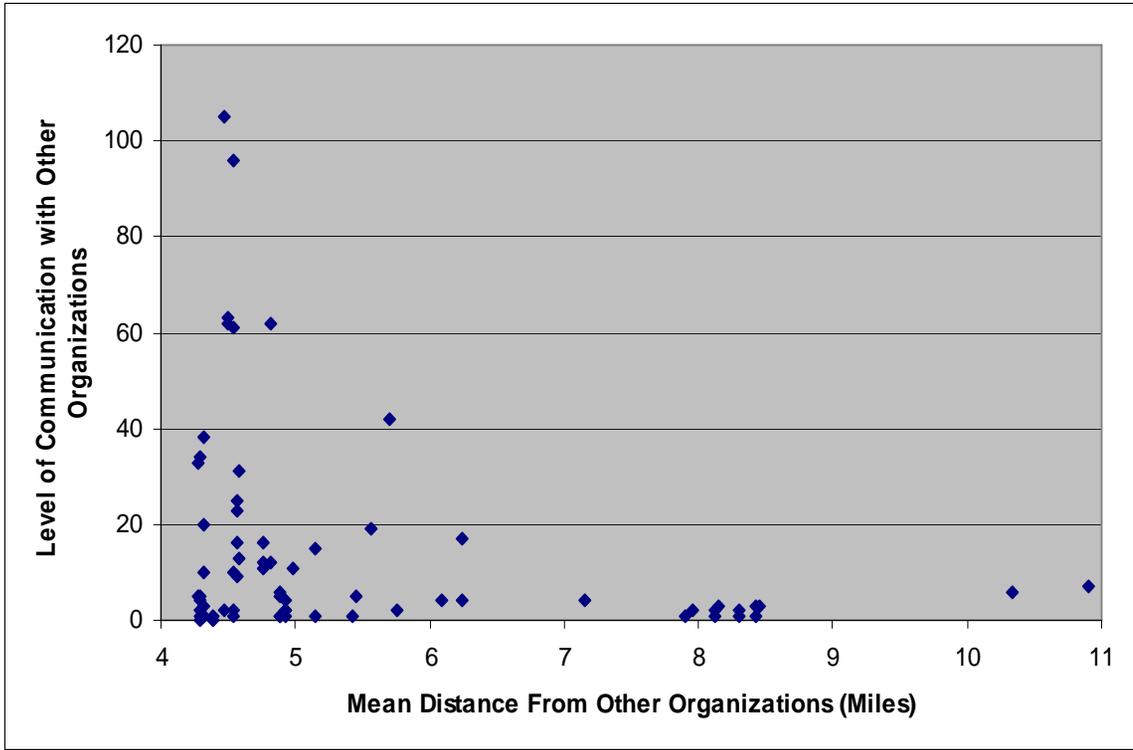


Figure by MIT OCW.



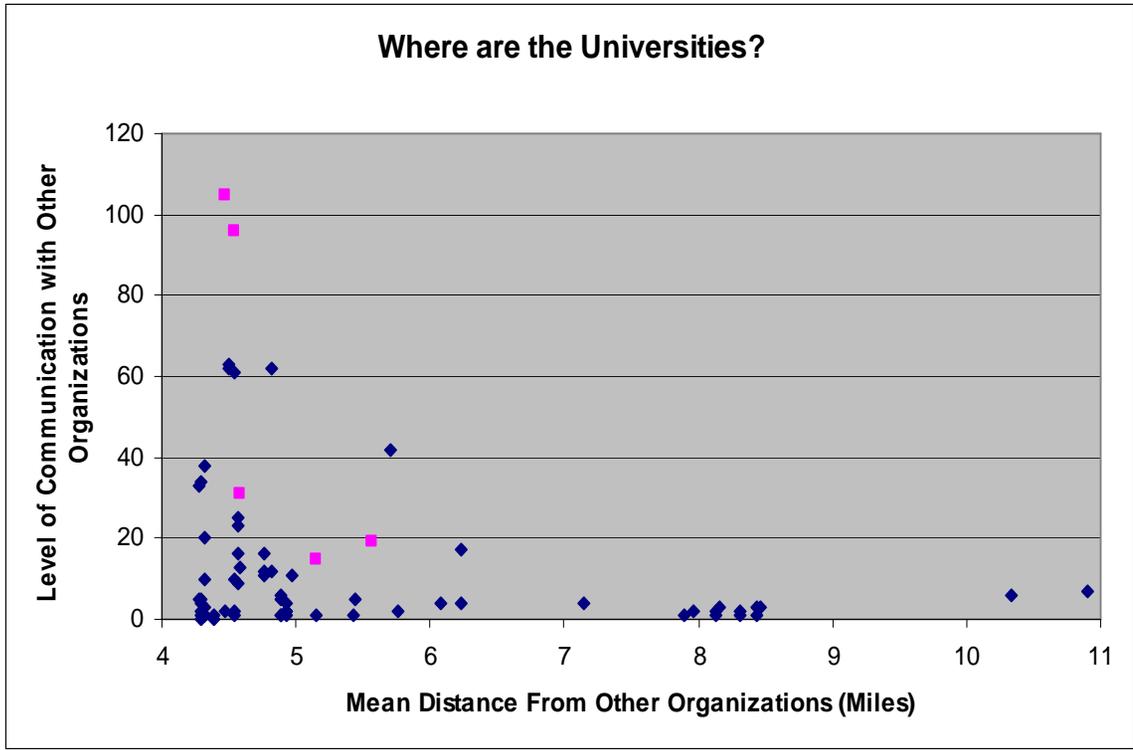
Where To From Here?

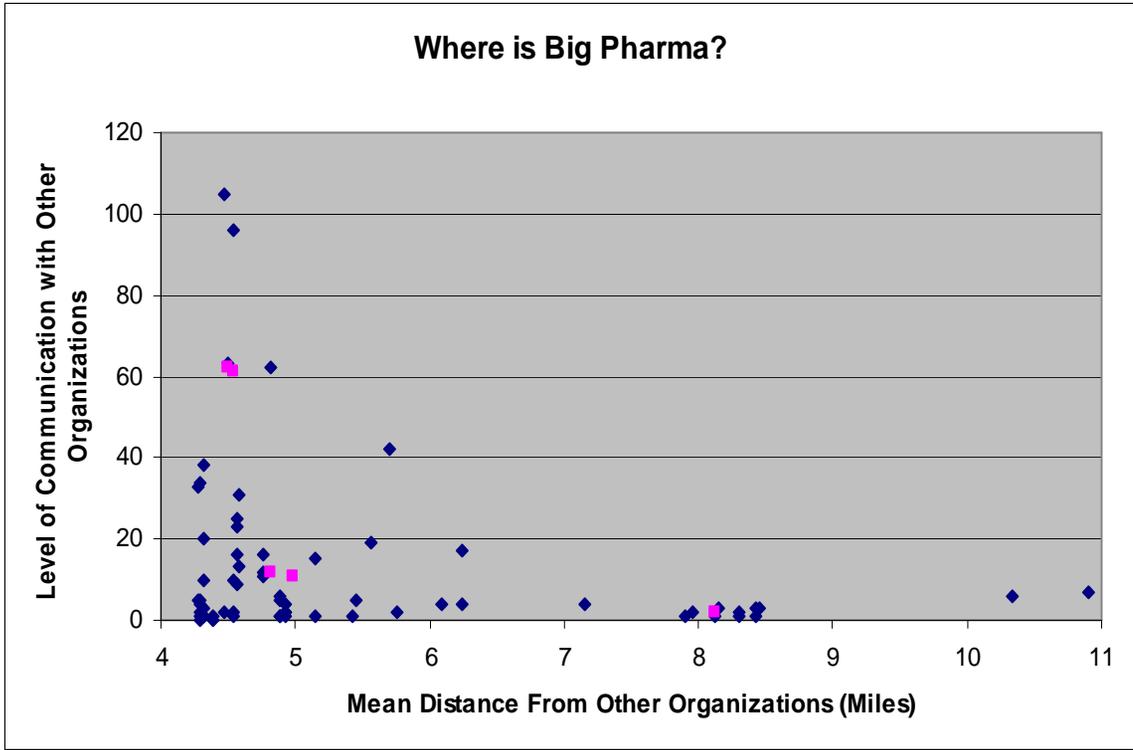
- What more can we learn?
 - Analyses of the network to relate network position to firm performance.
 - Comparison between cluster ‘members’ and firms in the control group.
 - Long term growth.
 - Size, valuation, etc.
 - Patent filings
 - Investigatory New Drug Applications
 - Etc.
 - Follow-up interviews to flesh out the network results.
 - Advice to the many geographic regions attempting to stimulate the growth of similar Biotech clusters.
- Is this the new model for doing R&D?
 - How do individual firms capture the gains?





Where are the Universities?







Where is Big Pharma?

