Awareness in Collaboratories

Airong Luo
airongl@umich.edu

WACE 2006

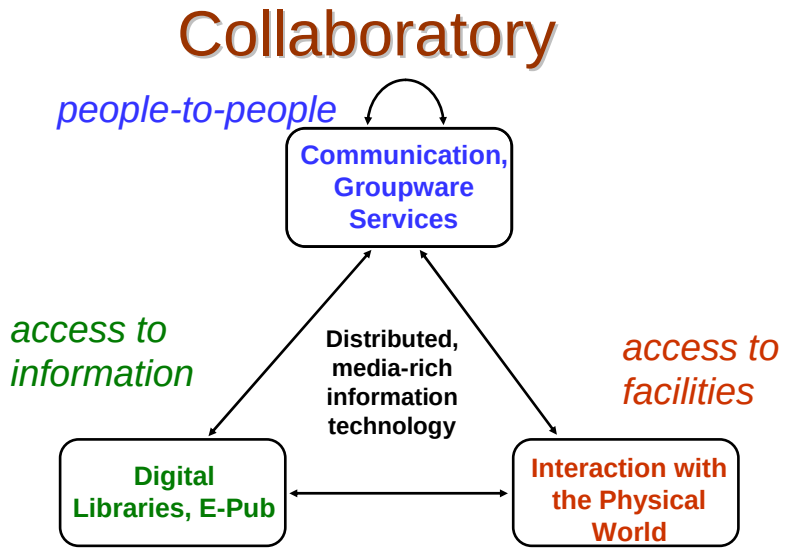
Dec. 13, 2006
Geneva, Switzerland

SCHOOL OF INFORMATION
UNIVERSITY OF MICHIGAN

Agenda

- Awareness needs
- How awareness needs are met
- Barriers to gain awareness
- Discussion of how technology can help?

What is a Collaboratory?



- an organizational entity
- spans distance
- provides access to data sources, artifacts and tools required to accomplish research tasks
- supports rich and recurring human interaction oriented to a common research area. (Olson *et al*., 2004)

Awareness Discussed

- Awareness for Coordination
  - Who is doing what
  - Collaborators' working progress
- Awareness for learning
  - How collaborators solve the problem
- Awareness of where the needed information is
- Awareness of timely information

Research Questions

- What are the socio-technical solutions to meet scientists' awareness needs in collaboratories?
- What are the socio-technical barriers for scientists to obtain awareness?

Research Methods

- Qualitative approach
  - Interviews
  - Analyzing public documents
  - Field of observation
- Sampling
  - Identifying collaboratories: identify eight collaboratories from www.scienceofcollaboratories.org
  - Including collaboratories which have participants from various types of institutions
  - Identifying interviewees: convenience sampling followed by snowball sampling

Collaboratories Studied

Collaboratory	Field	Distribution of participants	Countries of Participants Being Interviewed
A	Biomedical	1 lab in US, 3 labs in China	2 China, 1 US
B	Biomedical	30 labs in 6 countries	2 China
C	Molecular Biology	55 labs in 12 countries	2 Korea, 1 US, 1 China
D	Molecular Biology	about 246 participants	1 US, 1 Korea, 1 South Africa, 1 Taiwan
E	Biomedical	134 labs in 15 countries	1 US, 1 Korea, 1 South Africa, 1 Taiwan
F	High Energy Physics	86 institutes in 29 countries	3 US, 1 China
G	High Energy Physics	160 institutes in 36 nations	1 Germany, 1 Korea
H	High Energy Physics	47institutions in 15 countries	1 US, 1 Chinese

Awareness for Coordination

- Knowing collaborators' working progress
  - Email (exchange progress report)
  - Regular video conference or teleconference

Awareness for Learning

- Knowing how collaborators solve problems
  - Email
  - Discussion (face-to-face, video conference or teleconference
  - Knowledge repositories
    - Documentation
    - Wiki
    - Web forums
    - Databases

Investigator	MicroArray Experiment	Samples Analyzed	Data Files	Gene-chip version	Data Analysis	
filter	filter				Low Level	High Level (if performed by Core E)
Steven Rosen	Gene expression in experimentally injured and control mouse spinal cords	MicroArray Samples	Dec 25, 05	GLYCO_v2		
Martin Lotz	ML 6: Impact of mediator nitric oxide on gene expression in human chondrocytes. Expanded Study	MicroArray Samples	Dec 06, 05	GLYCO_v2		
Susan Fisher	Susan Fisher 1: Effects of estrogen and progesterone on glycosyltransferase expression in mice	MicroArray Samples	Nov 19, 05	GLYCO_v2		
Minoru Fukuda	Changes in gene expression during the transition from inflammation to cancer following Helicobacter felis infection	MicroArray Samples	Oct 10, 05	GLYCO_v2		
Celso A. Reis	Celso Reis 1: Gene expression changes in the gastric epithelial cells introduced by Helicobacter pylori infection	MicroArray Samples	Sep 26, 05	GLYCO_v2		

Micro Array Experiment : MAEXP_281_100505

General Information	
Experiment ID:	MAEXP_281_100505
Experiment Title:	Susan Fisher 1: Effects of estrogen and progesterone on glycosyltransferase expression in mice
Experiment Date:	10/05/2005
Status:	Public
Protocol ID:	

Experiment Description

The Fisher lab is testing the hypothesis that the mucin-coated oral and uterine cavities present similar carbohydrate receptors that specify the bacterial ecology of both regions and the repertoire of these oligosaccharide species is hormonally regulated. This theory also suggests that certain individuals express carbohydrate receptors that make them susceptible to both periodontal disease and preterm labor. Experimental procedure: 40 mature female mice were ovariectomize . The mice were allowed to rest for two weeks to eliminate any remaining endogenous estrogen (E2) and progesterone (P4). Then the mice were separated into four groups (10 each) that received the treatment indicated. Group 1: ovariectomized mice with no supplement, only sesame oil vehicle. Group 2: ovariectomized mice with only P4 supplement (2 mg/day/mouse). Group 3: ovariectomized mice with E2 supplement (100 ng/day/mouse). Group 4: ovariectomized mice with both P4 (2 mg/day/mouse) and E2 (100 ng/day/mouse) supplement. The treatment lasted for 4 days; the steroids were dissolved in sesame oil and injected subcutaneously. After treatment, salivary glands (parotid, submandibular, and sublingual gland) and uterine horns with cervix were collected. Total RNA was extracted from these samples according to the Core E recommended protocol. Three independent sets of total RNA samples from each tissue were hybridized to the GLYCOv2 array and analyzed.

Links

List of MicroArraySamples for this Experiment

Micro Array Experiment : MAEXP_281_100505

General Information	
Experiment ID:	MAEXP_281_100505
Experiment Title:	Susan Fisher 1: Effects of estrogen and progesterone on glycosyltransferase expression in mice
Experiment Date:	10/05/2005
Status:	Public
Protocol ID:	

Experiment Description

The Fisher lab is testing the hypothesis that the mucin-coated oral and uterine cavities present similar carbohydrate receptors that specify the bacterial ecology of both regions and the repertoire of these oligosaccharide species is hormonally regulated. This theory also suggests that certain individuals express carbohydrate receptors that make them susceptible to both periodontal disease and preterm labor. Experimental procedure: 40 mature female mice were ovariectomize . The mice were allowed to rest for two weeks to eliminate any remaining endogenous estrogen (E2) and progesterone (P4). Then the mice were separated into four groups (10 each) that received the treatment indicated. Group 1: ovariectomized mice with no supplement, only sesame oil vehicle. Group 2: ovariectomized mice with only P4 supplement (2 mg/day/mouse). Group 3: ovariectomized mice with E2 supplement (100 ng/day/mouse). Group 4: ovariectomized mice with both P4 (2 mg/day/mouse) and E2 (100 ng/day/mouse) supplement. The treatment lasted for 4 days; the steroids were dissolved in sesame oil and injected subcutaneously. After treatment, salivary glands (parotid, submandibular, and sublingual gland) and uterine horns with cervix were collected. Total RNA was extracted from these samples according to the Core E recommended protocol. Three independent sets of total RNA samples from each tissue were hybridized to the GLYCOv2 array and analyzed.

Links

List of MicroArraySamples for this Experiment

- *From the publications, you can only get the success stories. But in this kind of databases, people also reported their failure experiences, and I learned a lot from people's failure. If I know that method did not work, I will not use that method in my research."*

  Dr. S (Biomedicine, Korea)

Barriers Here!

- Uneven access to teleconferences and video conferences
  - Low bandwidth
  - Time zone difference
  - Missing all the informal communication in various meetings

- *In meetings and conferences, scientists can learn from other scientists' discussion…. When a scientist makes presentation, other scientists raise questions and make suggestions. The presentations are usually posted online, but the questions and suggestions raised are not posted. Scientists who are not present at the meetings miss the questions and suggestions.*

  Dr. O (High energy physicist, China)

Knowing Where the Information Is

Where is the better, or best information?

In such a collaboration where there are more than 2000 participants. Even for a really small problem, many people are working on it. And they post their notes. Whose notes should I read?

Dr E. (US, High Energy Physicist)

Knowing Timely Information

- Informal communication

science of collaboratories

An alliance to advance understanding of collaborative research

Barriers Here!

- What about the remote people?
- What about scientists cannot afford to go to the site?

- *What happens to people who are not at Institute X is that they tend to know important things, but that was a few days late or even a week late or even a month….. Often a person has a problem, but he doesn't know why. If he has a problem with the software, for example. It doesn't work. Why not? If he is here. He is like the software doesn't work. Does anyone have any clue? "Oh, you have changed something." But if you are outside, you would think, "Oh, maybe it's me. I'll try to fix it." You send an email to someone. They don't respond your mail. Then you go to the meeting and you ask in the meeting, it's already two days later.*

  Dr. Y (US, High Energy Physicist)

Acknowledgement

- Thanks for my dissertation committee members
- Thanks for Dr. Homer Neal and Dr. Steven Goldfarb
- Thanks for all the scientists who took their time talking to me

- Comments?

Questions?

Suggestions?