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BRIDGING THE GAPS: ENTREPRENEURSHIP, SCIENCE and GENDER

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- **Symptoms**
- **Diagnosis and Treatment**

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WOMEN IN SCIENCE: A story of "Few…"

- **Fewer women than men hold jobs in science and engineering – 27 percent to 73 percent!**
- **Women earn over half of all doctoral degrees in biology but there are far fewer women in postdoctoral, tenure-track, and tenured faculty positions**
- **Fewer than 3 percent of Nobel Laureates have been female**
- **One year after graduation, women in science earn fewer dollars (24 percent less) than their male counterparts**

Acknowledgement:
Hazen, Robert M. "Why Should You Be Scientifically Literate?" *BioScience* 12/02
Katz, S.J. "WEBS: Practicing Faculty Mentorship." *Bioscience* 58.1 (2008) 15.
DeWelde, Kristine, Sandra Larsen, and Heather Thiry. *Women in Science, Technology, Engineering and Math (STEM)*.

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“…..and Fewer”

- **In 2006, there were more women than men in the top 10 percent of fundable NIH grant applications**

BUT

- There are fewer grants per Private Investigator (PI) among women
- Fewer dollars per grant awarded to women
- Fewer instances of successful rates of reapplication for women

Acknowledgement:
Hazen, Robert M. "Why Should You Be Scientifically Literate?" *BioScience* 12/02
Katz, S.J. “WEBS: Practicing Faculty Mentorship.” *Bioscience* 58.1 (2008) 15.
DeWelde, Kristine, Sandra Larsen, and Heather Thiry. *Women in Science, Technology, Engineering and Math (STEM)*.

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WOMEN ENTREPRENEURS: A better story, but not Great

- **In 2008, women-owned businesses accounted for 40 percent of all privately owned U.S. businesses**
  - 10 million firms
  - Contribute $3 trillion to the U.S. economy

BUT

- **Performance metrics for female-led new ventures lag behind those of male-led new ventures**
  - The average start-up owned by a woman is 22 percent less profitable than a new business owned by a male entrepreneur
  - The four-year survival rate of businesses started women entrepreneurs is 8.6 percent lower than that of new businesses started by men

Acknowledgements:

"Key Facts about Women-Owned Businesses." *Center for Women's Business Research*. Center for Women's Business Research, 2009. Web. <http://www.womensbusinessresearchcenter.org/research/keyfacts/>.

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MEN ARE FROM MARS, WOMEN FROM VENUS

- **Male and female entrepreneurs report different motivations for starting their businesses**
  - Women: more job flexibility and autonomy
  - Men: economic and financial objectives
- **Women face more competing domestic demands for their time**
  - Female entrepreneurs tend to work fewer hours on average; Men invest more time in growing their ventures
- **Female entrepreneurs more often start lower risk/return businesses, such as personal services and retail**
  - Businesses started by men cover a broader spectrum, including manufacturing and technology
  - Male entrepreneurs create businesses that are less reliant on a local customer base

Women are no less capable – but our mindsets, preferences and behaviors *are different*

Acknowledgements:

Brush C. G., (1992). Research on women business owners: Past trends, a new perspective and future directions. *Entrepreneurship: Theory and Practice* 16:5–30

Michaels, Nancy. "Women Entrepreneurs Growing in Numbers & Importance." *SCORE: Counselors to America's Small Business*. Web. http://www.score.org/m_pr_20.html

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HELP ME HELP YOU

- **Successful women entrepreneurs report that their major hurdle was accessing venture capital**
- **According to the Center for Women's Business Research, women-owned business receive only 3-5 percent of venture capital**
- **Nearly all angel funding (90%) goes to men**

BUT

- Women represent fewer than 10 percent of the ***requests*** for angel dollars
- When women ***do request*** venture funds, gender bias almost disappears (13 percent of women are funded vs. 15 percent of men)

"SHOW ME THE MONEY!"

Acknowledgements:
UNH/Washington State. *Do Women-Owned Businesses have Equal Access to Angel Capital?,* Journal of Business Venturing.
Bowles/McGinn. *Gender in Job Negotiations: A Two-Level Game,* Insights Magazine, Fall 2008.

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"ASK (less) AND YE SHALL RECEIVE (less)"

- **A recent study of institutions that are affiliated with Harvard Medical School found that female and male investigators had equal success in winning grants from NIH**

BUT

- Women requested fewer dollars: $115,000 on average vs. $150,000 for men
- Women received fewer dollars on average: $98,000 vs. $125,000 for men

AND

- **Women generally request smaller loans from banks than men**

ASK FOR MORE, AND YE MAY RECEIVE MORE

Acknowledgement:
Pollner, Fran. "Bias Against Women in Science: It's Still There and it's Got to Go." *The NIH Catalyst* (Mar.-Apr. 2008).
Weisbren, Susan. "Gender differences in research grant applications and funding outcomes for medical school faculty." *Women's Health* (March, 2008).
DeWelde, Kristine, Sandra Larsen, and Heather Thiry. *Women in Science, Technology, Engineering and Math (STEM)*.

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USE THE OLD GIRLS NETWORK…BUT OLD BOYS WILL DO

- **Women often lack the network that successful corporate fundraising requires, and there are fewer women mentors**
  - A study by North Carolina State University shows that white men receive more information about business opportunities of all types through their "networks" than do women and racial minorities
- **Female mentors are more likely to serve as role models and provide psychological support for their female protégés**
- **Male mentors are more likely to advocate on behalf of their female protégés; female mentors encourage their protégés to become self-advocates**

FIND A MENTOR…BE A MENTOR

Acknowledgement

Bowles/McGinn. *Gender in Job Negotiations: A Two-Level Game,* Insights Magazine, Fall 2008.

North Carolina State University. Newsroom. *Study Highlights Hurdles Facing Women, Minorities in Job Market*. 17 Aug. 2009. <http://news.ncsu.edu/releases/study-highlights-hurdles-facing-women-minorities-in-job-market/>.

Ragin, Belle R., and John Cotton. "Gender and Willingness to Mentor in Organizations." *Journal of Management* 19.1 (1993):

Settles, Isis H., Lilia M. Cortina, Abigail J. Stewart, and Janet Malley. "Voice Matters: Buffering for the Impact of a Negative Climate for Women in Science." *Psychology of Women Quarterly* 31 (2007): 270-81

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SCIENTIST ENTREPRENEURS MUST CROSS THE "CULTURAL DIVIDE"

SCIENCE

Focus: Methodology

Values: Openness and Sharing

Demands: Validity ("Is it Valid?")

Success: Prestige and Contribution to a Body of Knowledge

Lifecycle: Progressive and longer term development

BUSINESS

- **Focus: Results**
- **Values: Competitive Advantage**
- **Demands: Utility ("Is it Useful?")**
- **Success: Financial Performance and Shareholder Value**
- **Lifecycle: Emphasis on accelerated development**

BE OPEN TO A BLEND OF PARADIGMS

Acknowledgement:
Pisano, Gary. *Science Business: The Promise, The Reality, and the Future of Biotech* (Cambridge, MA: Harvard Business, 2006.)

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ENTREPRENEURIAL SUCCESS REQUIRES EI*

Technical and Observational Capabilities: Empirical

- Anchored in Data and Analysis
- Critical Thinking
- Unwillingness to accept things "on faith"
- Deductive Reasoning
- Validation

Emotional Intelligence: Intuitive

- "Thought is Action"
- Appetite for Risk
- Comfort with big leaps of faith
- Inductive Reasoning
- Benchmarking

Emotional intelligence (EI) is one of the most important ideas to hit the business world in recent years. It is based on the notion that the ability of managers to understand their own emotions, and those of key stakeholders, is key to business performance.

IT'S OK TO TRUST YOUR"WOMEN'S INTUITION"

Acknowledgement:

Howard Hughes Medical Instiute, "Becoming a Scientist," 2008.

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DEVELOP "MANAGERIAL DNA"

Sue's Managerial DNA: Easier

- The CEO owns the vision and strategy of her organization
- Intervene quickly to address problems – staff, process, organizational, etc.
- Whenever possible, test your ideas with the market
- Communicate, communicate, communicate

Sue's Managerial DNA: Harder

- Empower your team – clearly state your expectations to senior managers and then get out of their way
- Stay agile in your decision making – Know when it's better to ask forgiveness than permission
- You are the Control Tower – Stay on top of the "big picture"
- Learn to prioritize and compartmentalize

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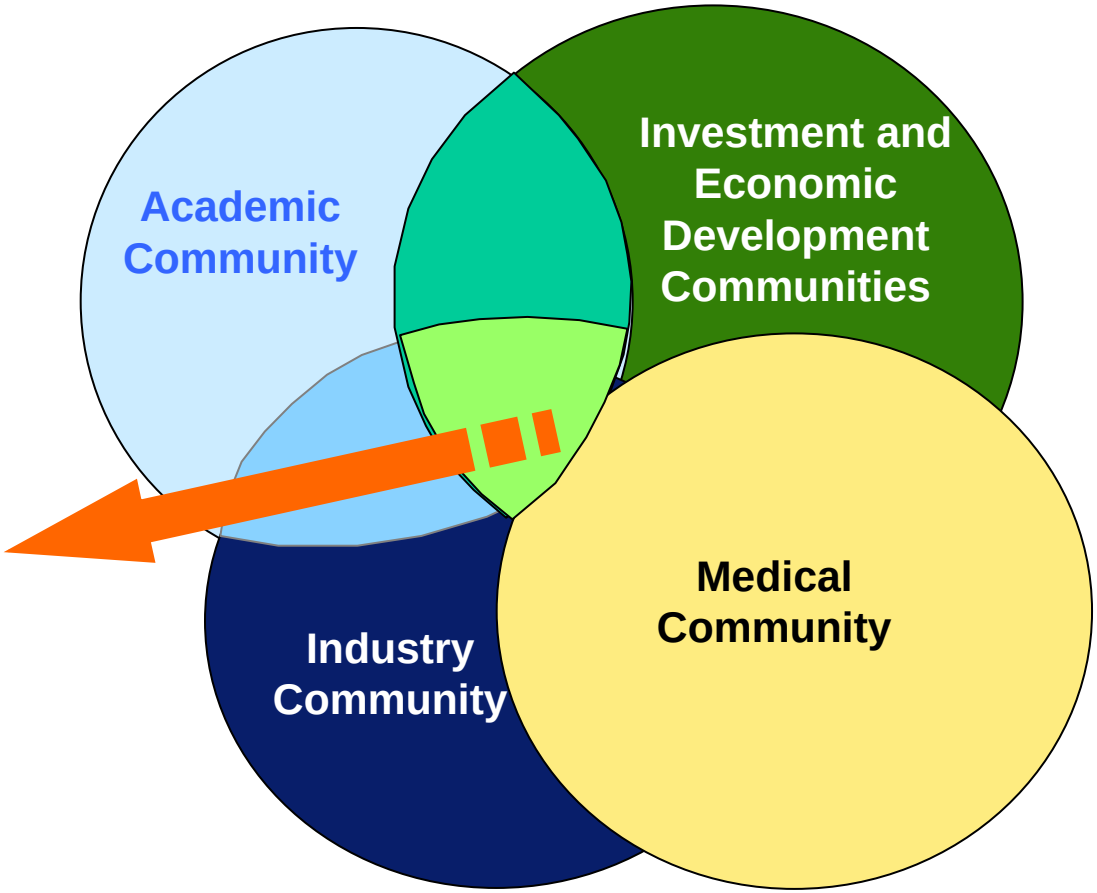
THE LIFE SCIENCES INITIATIVE – PART OF THE SOLUTION IN MASSACHUSETTS

- FUND EARLY-STAGE COMPANIES and TECHNOLOGY TRANSFER
- PROMOTE WORKFORCE DEVELOPMENT
- STRENGTHEN THE COMPETITIVE POSITION OF ACADEMIC and MEDICAL RESEARCH INSTITUTIONS
- SERVE AS A CONVENER AND COORDINATOR

Major Stakeholders



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MASSACHUSETTS LIFE SCIENCES CENTER PROGRAMS

The Center's Matching Grants advance the careers of New Investigators and the pipeline of innovative research at Massachusetts institutions.

2009 FEMALE RECIPIENTS

Institution	Researcher	Title of Research	Award
Immune Disease Institute, Children's Hospital	Dr. Sun Hur	Structural and kinetic investigations of the mechanism for self vs non-self RNA discrimination by RIG-I	$100,000 for two years.
Harvard University	Dr. Briana Burton	Mechanisms of nucleic acid transport across membranes	$100,000 for two years
Immune Disease Institute	Dr. Judy Lieberman	An siRNA-based microbicide	$250,000 for two three years
Massachusetts Eye and Ear Infirmary	Dr. Konstantina Stankovic	Functional role and therapeutic implications of osteprotegerin secretion by the auditory nerve	$100,000 for two years

2008 FEMALE RECIPIENTS

Institution	Researcher	Title of Research	Award
Boston University	Hatice Altug	Development of multiplexed, ultra-sensitive, label-free and rapid biosensing technologies for proteomics and virus detection applications	$92,000 for three years
Massachusetts Institute of Technology	Laurie Boyer	Investigating how chromatin organization in embryonic stem cells influences cell fate specification	$100,000 for three years
University of Massachusetts, Lowell	Xingwei Wang	Miniature label-free biosensing probes for rapid detection of virus, bacteria, and cells	$100,000 for three years

Of 28 research grants, 25 percent were awarded to women scientists

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MASSACHUSETTS LIFE SCIENCES CENTER PROGRAMS

2009 INTERNSHIP CHALLENGE:

- **A workforce development program to enhance the talent pipeline for life sciences in Massachusetts**
- **Provided 104 Summer internships to undergraduate STEM majors considering career opportunities in life sciences**
  - ✓ **Half of the 104 interns placed were women!**
  - ✓ **Nearly all of the interns were placed in early stage companies and had a chance to "sit at the table" with the executive team (the entrepreneurs)**

Interns Andrew Kenoian and Kelly Johnson of Worcester Polytechnic Institute meet their new bosses at NP Medical.

Lindsay Bonvini, a rising senior at Stonehill College and Michael White from the University of Massachusetts, participated in the challenge.

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SUPPORTING THE DEVELOPMENT OF INNOVATIVE CURRICULA AND DEGREE GRANTING PROGRAMS

- **Professional Masters of Science degree**
- **Cross-training between STEM Departments and Business Schools**
  - ✓ **Finance**
  - ✓ **Marketing**
  - ✓ **Entrepreneurship**
- **Science Club for Girls**

The Massachusetts Life Sciences Center and the Massachusetts Biotechnology Council issued the report, *Growing Talent*

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