

WOMEN IN INDUSTRY

A FORMULA FOR SUCCESS

The basic steps in a chemical reaction provide a useful framework for building a rewarding career.

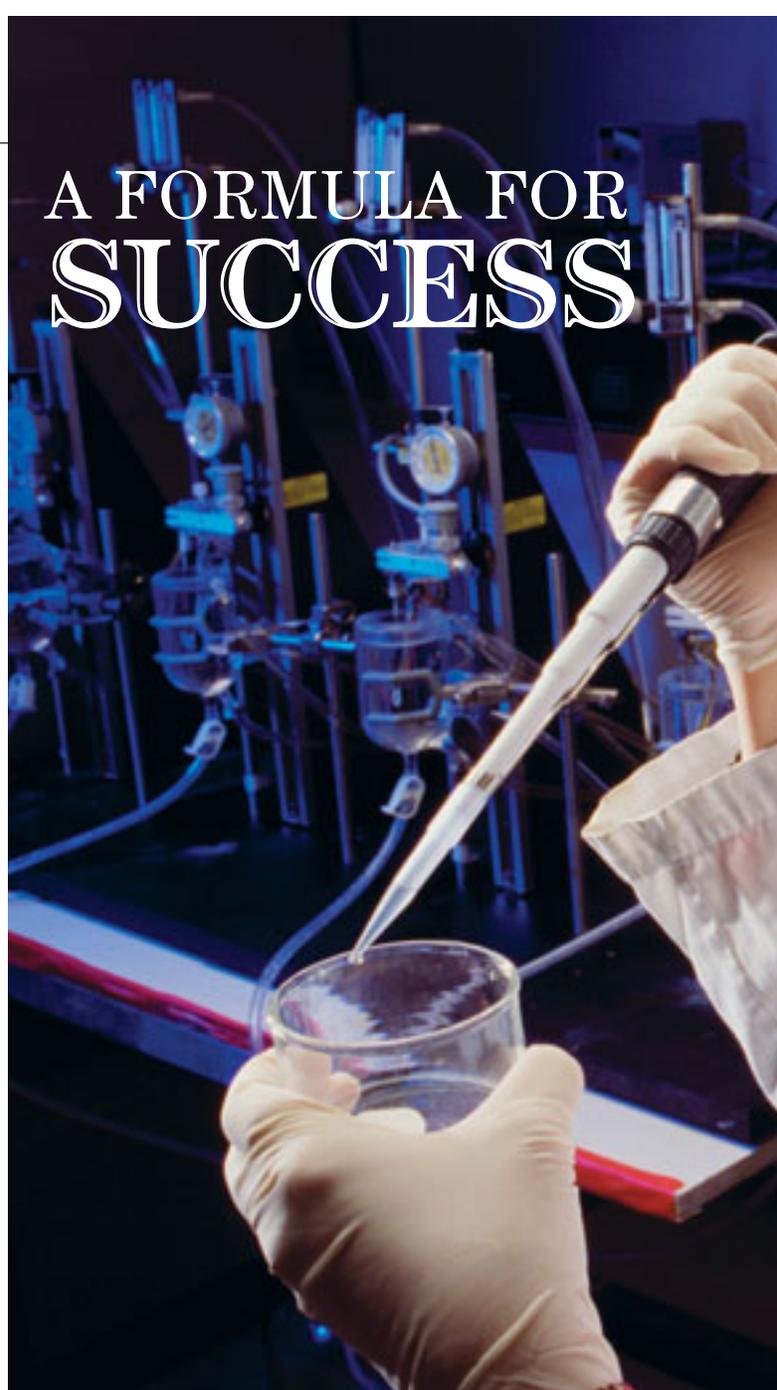
We all wish that career-building were as simple as opening a textbook (see box, below) and following the instructions to produce the desired result—a career that glitters like a beautiful crystal of high purity, produced in high yield.

But, of course, it's not a simple chemical reaction. Crafting a career is a messy, multistep process, and the result rarely resembles one's original vision. Yet the basic steps of carrying out a chemical reaction provide a useful framework for understanding the lifelong process of building a rewarding and fulfilling career:

- First, gather high-quality starting materials. For the woman chemist considering a career in industry, you'll need to start with solid technical expertise.
- Second, choose an appropriate solvent. Your working style—the way you communicate, interact, and socialize with colleagues—can have a profound effect on the pace and direction of your career development. For the woman chemist entering a male-dominated corporate culture, you'll need to be aware of perceptions and expectations, as well as opportunities for slowly transforming that culture.
- Third, find some good catalysts. Your mentors—and you'll want to have many of them over the course of your career—

Experiment #1: In this experiment, the chemist will choose appropriate starting materials, solvents, catalysts, and reaction conditions to create a unique substance—her own career in the chemical industry.

—from *The Secret Textbook of Life and Chemistry*



can help lower the barriers you face as you move from point A to point B to point C and beyond.

- Fourth, make good use of cross-linking agents. Networking with colleagues can provide links throughout the organization and profession that give your career long-term strength, stability, and resiliency.
- Fifth, use high-pressure and high-temperature conditions at times. Successful women scientists recommend high-profile and “stretch” assignments to gain visibility, confidence, and new skills.

Here's how some women chemists and their companies are putting these principles into practice.

Technical Expertise: The Starting Material

A recent study of 30 women scientists (*Women Scientists in Industry, A Winning Formula for Companies*, Catalyst, 1999) showed how women struggle against the perception that science is a male pursuit. The traits associated with successful careers in science—

PHOTO: PHOTODISC



RANDALL WEDIN

quantitative skills, objectivity, and a singular commitment to work—are generally viewed as male attributes. To overcome this perception, the women in this study used the success strategy of cultivating technical expertise.

To cultivate such expertise, women must start with a solid educational background, keep current on technical issues, and consistently exceed expectations. As they develop a clear technical niche that provides value to the company, they improve their chances for success and counter any potential backlash and resentment from male employees.

Once a scientist establishes her technical expertise and starts moving ahead in the company, she'll soon face a critical decision—whether to focus on moving up the “technical ladder” or switching to the “management track”.

Dee Strand and Leslie May are Ph.D. chemists who joined the Dow Chemical Co. about 15 years ago. When they came to their decision points, they made different choices, with Strand staying on the technical track and May switching to management.

Strand's current position in Midland, MI, is analytical leader. To succeed on the technical track, Strand offers this advice: “Don't be afraid to ask lots of questions. Get yourself up to speed on projects fast so that you can really make a contribution.” She also emphasizes the importance of keeping your technical expertise visible to others: “Make sure you always volunteer to give technical presentations. You may not feel you have the time to do it, but it's worth it.”

Strand reports that women sometimes feel a subtle pressure to move from the technical to the management track. “Management, with very good intentions, wants to make technical women in the organization visible. But they frequently do that by giving women leadership opportunities that are nontechnical. Before you know it, there's a perception then that you don't have the technical expertise it takes to move up the technical ladder. You have to make a decision about which way you want to go. If you truly want to be technical, sometimes you have to turn down those opportunities. You have to block out time on your calendar and say, ‘I'm going to work in the lab.’”

Moving to the Management Track

When Leslie May came to the technical/management decision point in her career, she chose a management position that gave her more interaction with people. Today, she is R&D director for organics, intermediates, solvents, and monomers at Dow's facility in South Charleston, WV. She serves on the leadership team that develops overall business strategies, with a clear accountability to the organization to deliver value. She motivates people to follow a vision and helps them get the resources to do their jobs. “I firmly believe that if you're going to deliver from a business perspective, you have to take care of the very folks that will help you deliver on all those action plans,” May says.

The communication, leadership, and people skills traditionally associated with women as managers are especially important in today's difficult business climate. “The marketplace has always

been demanding; that's the nature of economics," says May. "But ever since 9/11, things have changed. In order to succeed, the leadership has to be sensitive to the employees because of the sheer workload that needs to be prioritized."

Ironically, one of May's challenges as a manager is to help increase the number of women in senior technical roles. "It's taken longer for women to rise to the level of role model on the technical side, as compared to the managerial side. There was a quicker recognition that a woman could lead a group than there was that a woman could be the leader for a technology."

Dow has a strong interest in seeing more diversity in the technical ranks, says May. "It's helpful from the standpoint of work environment, increased career opportunities, and diversity of thought. And, as the world changes, it becomes a business advantage to be more diverse," she says.

Change of Style: Finding the Right Solvent

In any organization, there are unwritten rules, standards, and expectations that guide everything from appropriate language and humor to dress code and after-work socializing. Because women chemists find themselves in environments where the male majority sets the style, they must pay special attention to matching their personal style with the organizational style—just like finding the right solvent for a chemical reaction.

After joining Phillips Petroleum as a bench chemist, Frankie Wood-Black worked in a wide variety of technical and management positions. She's now director of business services for ConocoPhillips' downstream research organization in Ponca City, OK. From 1998 to 2000, she served as chair of ACS's Women Chemists Committee. When Wood-Black mentors students and colleagues, she points out that personal style affects nearly every decision—from how to confront and challenge someone during a business meeting to whether or not to join colleagues for after-meeting drinks on business trips.

"You have to be aware of your style," says Wood-Black. "We all have different styles, and companies have different styles. We've got to find styles that work for the person and styles that work for the company. If you're in a cutthroat, aggressive organization, you know your style will be different than if you're in a team-based, flat organization."

As chemical companies go through major organizational changes, such as the recent Conoco-Phillips merger, personal and organizational styles will evolve. As Wood-Black observes, "The companies are changing so fast that you have to be adaptable."

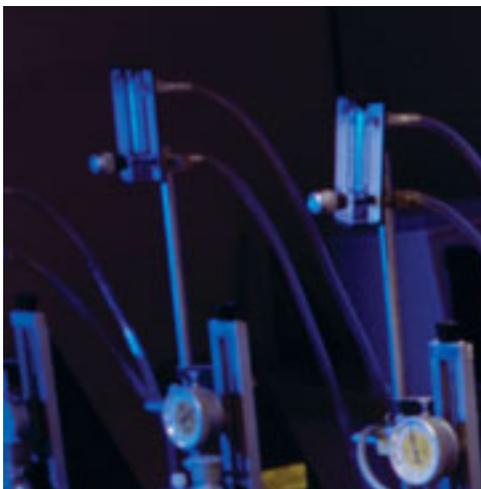
Sheila Wellington, president of Catalyst, a nonprofit research organization, devotes an entire chapter to "Style Matters" in her book *Be Your Own Mentor: Strategies from Top Women on the Secrets*

of Success. Among her "ten tips for developing your own successful style" are the following:

- Make others comfortable.
- Get past other people's assumptions.
- Radiate confidence.
- Learn the art of the humorous comeback.
- Be seen as a team player.

Wellington emphasizes, "Your main focus must be on producing results for the organization. Your image should be one you can live with, as well as one the organization is comfortable with.

Pick your battles carefully."



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Mentors: Catalysts Who Lower Barriers

Organizations that focus on the advancement of women in the corporate and scientific worlds emphasize very strongly the value of mentoring. A 1996 Catalyst study of nearly 500 executive women found that four out of five respondents considered "having an influential mentor" as at least somewhat important to their career advancement. And 37% explicitly stated it was a "critical ingredient" for success. Another Catalyst study found that women with mentors were 40% more likely to receive promotions than women without mentors.

The Association for Women in Science (AWIS) has published several guides on mentoring, and the organization received the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring in 1997. According to Linda Mantel, past president of AWIS, "Mentoring can help you learn the *ethos* of the place. It's sometimes difficult for a woman fresh out of graduate school, whether she's going into academe or industry, to figure out what's more important and what's less important in a particular place.

What really matters to people here? It's sometimes hard to find the answer by direct questions, but a good mentor will model behavior that clarifies what's important."

Today, one of the most important issues facing women chemists (and, increasingly, men chemists) is balancing work and life. According to Mantel, mentoring can be helpful with this issue by "showing the breadth of possibilities and making clear that each person has to make this decision on her own. There is no one right path. The path depends on the person, the organization, and how they feel about their own life. There are many ways of being successful." Mantel adds with a knowing smile, "None of them is easy."

Women scientists find mentors especially important if they want to move into management roles. Going through the transition from bench chemist to manager requires different skills, and a strong mentor can help make the transition a successful one. Early in her career at the Lubrizol Corp., organic chemist Kath-

leen Havelka, now the department head of the company's Applications Technology Group in Wickliffe, OH, was given the chance to participate in a high-visibility project. She quickly found that she needed some new communication skills to lead this multidisciplinary team, and her boss matched her up with a mentor with a strong business and communication background. "My mentor didn't have a technical background, but her commercial background was very useful in helping me to prioritize the work of the team and to communicate our progress," says Havelka.

Among the other benefits that a mentor can provide to a protégé are

- greater visibility within the organization;
- introductions to key people and groups;
- access to information, resources, and networks;
- feedback on personal and professional performance; and
- career path advice.

Because of the many benefits that mentoring brings to an organization and its employees—both female and male—smart corporations encourage mentoring through formal programs and informal support. At Dow, a mentoring program developed by the Women's Innovation Network (WIN) is now used by the whole company. At a recent WIN mentoring panel, says May, "the room was full, and it was full not only of women but of men." Procter & Gamble's Mentor-Up Program and Lubrizol's mentoring database provide additional examples of innovative approaches to mentoring. (For more information on mentoring, see "The Meaning of Mentoring", *Today's Chemist at Work*, March 2003, p 41.)

Networking: Cross-linking for Stronger Careers

The Catalyst *Women Scientists in Industry* study cites networking as one of five critical success strategies. Networking brings many of the same benefits as mentoring. Networks come in all shapes and sizes—from formal to informal, internal to external, and local to national. In all cases, however, they provide an important resource for exchanging information, finding mentors, developing leadership skills, sharing advice on balancing work/life issues, and gaining visibility in an organization.

The Catalyst study, however, also points out that women are more likely than men to be excluded from informal networks.

Realizing the limitations of relying strictly on informal networks, many companies have established formal, internal networks for women. Examples of successful internal networks include Dow's Women's Innovation Network, General Mills' Women's Forum, Lubrizol's Women in Lubrizol Leadership, and Merck's Women's Network. For external networks, women chemists take advantage of national and local organizations such as the Association for Women in Science (with 76 local chapters in 42 states), ACS's Women Chemists

Committee (with national, regional, and local section meetings), and MentorNet (with its online e-forum).

In addition to these formal networks, many successful women chemists have developed an extensive informal network of colleagues. Dee Strand uses the informal networking approach in her workplace: "I like to talk to technical people and bounce ideas off them. If you do an experiment and get unexpected results, take it to a bunch of people and ask them for their thoughts. Pretty soon they're your friends and you're all working together. It's a real team environment. You're constantly bringing

people into the team, people are leaving, and your network just broadens and broadens."

Stretch Assignments: Turning Up the Pressure and Heat

Successful women scientists in industry stress the importance of seeking out and accepting high-profile and stretch assignments. These types of assignments might involve a move between sectors, functional areas, and product lines. In other cases, the assignments might mean an international assignment or a line position in a manufacturing plant. The benefits to the individual can include exposure to other aspects of the business, to new people within the organization, to upper management, and to demanding situations.

Stretch assignments involve risk-taking. For scientists who are trained to focus and specialize, the idea of moving outside their field of technical specialization can be challenging, even frightening.

Wood-Black suggests that women need to be willing to step out of their comfort zone more quickly—and managers may need to push them. "When women are presented with a career opportunity, they feel like they

must have all of the tools in their tool kit—all their skills ready to go—before they accept it. I know this is a generalization, but their male counterparts tend to be more aggressive. Men will look at the opportunity and say, 'Oh, I can learn that skill on the job.' The result is a two- to five-year lag before women will take a career jump or career move or ask to be considered for a new position. I tell my male counterparts in management, 'Look, if you've got a good woman in your group, be aware of this tendency, and kick them in the tush. Get them out of their comfort zone.'"

May says, "People need to go to their coach, mentor, or leader and say, 'I'm interested in this type of position or subject. What types of things do I need to do to get there?' Those stepping-stone activities allow you to develop confidence as well as skills. The next time you're given an opportunity, you can say to yourself, 'I did the last one, so I should be able to figure out how to do this one.'"

Wood-Black stresses the importance of voicing your aspirations and flexibility. "If you're willing to consider a move, even a tempo-



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Resources

ACS Women Chemists Committee

(WCC, <http://membership.acs.org/w/wcc>)

The WCC mission is to be a leader in attracting, developing, and promoting women in the chemical sciences. WCC programs include symposia and workshops at national and regional ACS meetings, awards, publications, and an online mentoring program.

Association for Women in Science (AWIS, www.awis.org)

With over 5000 members, AWIS is dedicated to achieving equity and full participation for women in science, mathematics, engineering, and technology. At the local level, 76 chapters facilitate networking between women scientists at all levels and in all career paths. At the national level, AWIS publishes a variety of materials to inform girls and women about science programs and women's issues, including the following publications (available at the AWIS website):

- *A Hand Up: Women Mentoring Women in Science* provides practical advice and inspiration for women without access to an on-site mentor. Portions of the 2003 edition are available online. A Spanish version of the report, *Una Mano Al Futuro*, includes additional material to help encourage mentoring for Latina scientists.
- *Mentoring Means Future Scientists*, a 160-page report, provides a summary of the three-year AWIS Mentoring Project for undergraduate and graduate students.

Catalyst (www.catalystwomen.org)

Catalyst is a nationally recognized nonprofit organization with research and advisory services helping business and professional firms to advance women. The highly regarded Catalyst Awards honor innovative approaches to address the recruitment, development, and advancement of all managerial women. Useful Catalyst publications available at the website include:

- *Women Scientists in Industry*, a 60-page report, summarizes organizational barriers, success strategies (technical

expertise, change of style, stretch assignments, mentoring, and networking), recommendations for individuals and companies, and best practices for companies to emulate.

- *Be Your Own Mentor: Strategies from Top Women on the Secrets of Success* by Sheila Wellington and Catalyst (Random House, 2001) is available in bookstores, libraries, and online. Based on extensive Catalyst research, this 300-page "mentor-in-a-book" provides helpful advice on a wide range of topics.
- *Creating Women's Networks: A How-To Guide for Women and Companies* provides step-by-step advice on creating a network or working with a network already in existence.
- *Creating Successful Mentoring Programs: A Catalyst Guide* provides useful information that will help corporate organizations set up formal mentoring programs. The 32-page booklet provides practical tips, best practices, and research-based evidence on the value of mentoring.

Chemjobs (www.cen-chemjobs.org)

The classifieds and careers website of *Chemical & Engineering News*, Chemjobs offers tools, resources, and expert career advice to help new and experienced chemists reach their professional goals. The Career Article Archive features over 60 articles on subjects ranging from mentoring to working overseas to salary negotiations.

MentorNet: The E-Mentoring Network for Women in Engineering and Science (www.mentornet.net)

MentorNet, established in 1997, is a nonprofit organization built on the concept of "e-mentoring", using e-mail to facilitate mentoring relationships. Currently, the program matches mentors (female and male scientists and engineers from industry and government) with female students at the undergraduate and graduate level. MentorNet's Web-based discussion group, E-forum, provides an ongoing, electronic networking session where science and engineering professionals discuss topics ranging from work/life balance and time management to job searches and women's issues.

rary move, you need to make sure that people know that loud and clear. Otherwise, the company makes assumptions about your situation, and you'll never know there was an opportunity that you missed. Don't let the company make decisions for you."

In recent years, companies have implemented programs to encourage women to take on stretch assignments and to gather the breadth of experiences that will help them advance. For example, Corning, Inc., won a Catalyst Award in 1999 for its Women in Manufacturing program. Launched in 1992, the program increased the number of women serving as plant managers and also significantly decreased female attrition in the plants. Corning did this by including women interested in manufacturing in succession planning; analyzing the career paths of individuals in top manufacturing jobs; augmenting mentoring programs and work/life balance offerings; and making diversity performance a part of supervisors' evaluation and compensation.

Wood-Black offers this final advice: "It's okay to fail. Nine times out of 10, you learn more from your failures than you do from your successes. If you're always successful, you're not really stretching and growing. You've got to move forward."

Putting It All Together: The Grand Synthesis

Successful women chemists have carefully learned all these success strategies, and they've used them at just the right time to take the next step in their trouble-free and perfect careers. Right? Not at all.

May puts it this way: "It's rarely perfect. Be flexible. I can tell you that where I grew up in northeastern Kansas, I never would have thought I'd be doing what I'm doing now. I'm glad to give the next generation some of the information I wish I had known when I started out."

The process of crafting a career is like an ongoing chemical research project—a series of experiments with plenty of failures, dead ends, surprising results, and serendipitous successes.

You may open the secret textbook and begin Experiment #1—right now. Good luck.

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