Best Practices and Pearls in Interdisciplinary Mentoring from Building Interdisciplinary Research Careers in Women's Health Directors

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and the Building Interdisciplinary Research Careers in Women's Health Directors

Abstract

Background: Increasingly, national programs and leaders are looking at interdisciplinary collaborations as essential to future research. Twelve years ago, the National Institutes of Health (NIH) Office of Research on Women's Health (ORWH) developed and implemented the Building Interdisciplinary Research Careers in Women's Health (BIRCWH) K12 program to focus on interdisciplinary mentored career development for junior faculty in women's health research.

Methods: We applied a mixed-methods approach using an electronic survey and in-person presentations and discussions to understand best practices and lessons learned for interdisciplinary mentoring across BIRCWH K12 program leaders.

Results and Conclusions: We received responses from all 29 active BIRCWH programs. Factors associated with success included ensuring sufficient protected time for regular (weekly or biweekly) mentoring; mentors promoting the research independence of the Scholar; a team mentoring approach, including career as well as content mentors; and explicit and clear expectations outlined between the Scholar and mentor. The majority of programs conduct formal evaluations of mentorship, and 79% of programs offer training in mentorship for either Scholars, mentors, or both. This article presents program leaders' best practices, challenges, and lessons learned from mentoring junior faculty who are conducting women's health research, whether basic, clinical, behavioral, translational, or health services research, using an interdisciplinary mentoring approach.

Introduction

Effective mentoring is considered to be one of the most important components of a successful career in academia. Over recent years, momentum has been increasing for promoting interdisciplinary mentoring that includes collaboration across scientific disciplines.[1,2] The National Institutes of Health (NIH) Office of Research on Women's Health (ORWH) developed and implemented the Building Interdisciplinary Research Careers in Women's Health (BIRCWH) K12 program to promote interdisciplinary mentored career development for junior faculty in women's health research in 2000. As the concept of interdisciplinary research continues to be expanded through the NIH Roadmap and Common Fund initiatives, understanding how to mentor and train scientists successfully in interdisciplinary research is increasingly important.[3]

The ORWH recognized in the early 1990s that women's health research by its very nature must be interdisciplinary and should encompass not only clinical studies but also the full spectrum of research types, ranging from molecular and genetic studies to those of prevention, behavior, outcomes of interventions, and clinical translation of newly proven hypotheses.[4] The ORWH BIRCWH K12 program is built around three pillars: interdisciplinary research, mentoring, and career development.[5] The concept of interdisciplinary mentoring under the BIRCWH program necessitates the use of a team of mentors rather than a single mentor, recognizing that mentors from more than one area of expertise are better able to address complex health conditions that are relevant to women's health, such as HIV, diabetes, obesity, stroke, pain syndromes, and others. However, few studies have assessed the skills that are needed for successful interdisciplinary mentoring. Because the BIRCWH program has over a decade of

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experience in interdisciplinary mentorship and career development, best practices and lessons learned from NIH, ORWH BIRCWH programs may provide helpful information to other institutions and organizations that are focusing on career development of junior faculty.

This article describes the mentoring practices that are being used under the national BIRCWH mentored junior faculty (also known as "Scholar") career development program in women's health from ORWH. Currently, there are 29 BIRCWH sites across the United States (Appendix), and over 450 Scholars have participated as BIRCWH Scholars. The goal of this article is to provide an overview of the existing best practices in mentoring in an interdisciplinary environment under the BIRCWH program to inform further research efforts of this type of career development practice. This report seeks to identify the critical elements for successful mentoring approaches and techniques that may be used to provide tools for junior faculty development at other research-intensive academic institutions. Understanding the lessons learned in interdisciplinary mentoring has generalizable implications in terms of potentially leading to changes in the paradigm of mentoring practice across different training programs and ultimately for all disciplines of science.

Materials and Methods

We applied a mixed-methods approach to integrate findings from presentations, discussions, and an electronic survey. A 1-day interactive directors' roundtable of best practices of mentoring was held for BIRCWH program directors at the Annual Meeting of BIRCWH Directors at the NIH in November 2011. The workshop was facilitated by the three authors (J.M.G., J.D.N, J.G.R.). Half of the active BIRCWH sites presented information about their sites, and all programs participated in the discussions that followed. In advance of the meeting, three guiding questions were provided to the presenting programs to organize their presentations. Time was reserved at the end of the presentations for open discussion among all principal investigators and program directors (PI/PD). Summaries of program experiences, challenges, and pearls to successful research mentoring were provided from each program's presentation materials and from discussions.

After the meeting, all BIRCWH programs were invited to submit written responses to the three guiding questions (Table 1), as well as responses to general structured questions about numbers of mentors, evaluation of mentoring, and training in mentoring. Lastly, all programs were asked to submit a bulleted list of 150 words or less of pearls for best practices for mentoring. This process was conducted between October 2011 and February 2012. The Oregon Health & Science University Institutional Review Boards determined that the project did not meet the definition of human subject research per 45 CFR 46.102.

Analysis

Quantitative data were analyzed using descriptive statistics. Qualitative data were analyzed using content analysis performed by two authors (J.M.G., J.G.R.) and also independently using NVivo software by two objective research associates with training in qualitative analyses. Narrative responses were reviewed as a whole to identify initial themes and then again

TABLE 1. GUIDING QUESTIONS ABOUT MENTORING

Please respond to the following three guiding questions:

1. We are looking for ingredients to successful mentorship. Could you please compare and contrast successful and less successful mentee-mentor relationships that you have seen in your program (What do you think makes them succeed vs. fail (e.g. process, personality, skill, other)? What are the most common challenges reported in the mentor-mentee relationship?
2. Do you have a process to evaluate mentorship quality? (If there are tools/instruments that you use, please attach.)
3. Do you have programs focused on mentoring (educational activities, training, etc) at your site? (Please list.)

in more detail to identify subthemes. Counts for occurrences of themes are presented in parentheses in results.

Results

We received responses from 29 (100 %) current BIRCWH program leaders. On average, programs reported that Scholars had an average of three mentors, with a range of one to seven mentors. Programs were asked to compare and contrast successful vs. less successful mentoring relationships and to describe the characteristics that are associated with success. Themes obtained from the three guiding questions are provided in Table 2. Factors associated with success included ensuring that both mentor and Scholar have sufficient protected time to invest in regular (weekly or biweekly) mentoring, mentors being able to support the independent research of the Scholar (referred to by several respondents as "mentor altruism") as opposed to having the Scholar work on the mentor's research, interdisciplinary team mentoring including career as well as content mentors, and clear expectations and goals outlined between the Scholar and mentor from the beginning.

BIRCWH programs were asked how they select mentors for their BIRCWH Scholars. The majority of programs reported that potential Scholars can self-select mentors but that each mentor needs to be approved by the BIRCWH leadership or BIRCWH committee (and ORWH). They also reported that the BIRCWH leadership or BIRCWH committee may select specific mentors for Scholars where a need is identified for either content or career mentoring. Some sites recommended the use of a contract or formal agreement to outline expectations and goals between mentor and Scholar ($n=11$). Innovative programs designed to support Scholars and mentors included providing protected time and institutional incentives to promote mentoring, an institutional mentoring academy, a virtual mentoring network, and mentoring toolkits.

Among the 33 factors reported to be associated with failure of the mentoring relationship, the leading factors reported were lack of support for mentor or Scholar or both ($n=7$), poorly stated or lack of clear expectations ($n=6$), and time constraints ($n=6$). Other common challenges included lack of time/resources for mentoring and poor time management for either Scholars or mentors.

Twenty-eight of 29 BIRCWH programs formally evaluate mentoring. Most sites evaluated mentoring using surveys,

TABLE 2. RESPONSES TO GUIDING QUESTIONS INTERDISCIPLINARY MENTORING ABOUT INGREDIENTS
OF SUCCESSFUL MENTORSHIP AND COMMON CHALLENGES

Domain	Response
Themes of success in successful mentoring	Mentor-Scholar interests closely match
	Mentor-Scholar personalities/styles mesh
	Good communication between mentor and Scholar
	Regular weekly or biweekly meetings between Scholars and mentors addressing research content and career issues
	Mutual accountability
	Setting an agenda for each meeting helps promote productivity
	Interdisciplinary team mentoring approach is highly effective; both content and career mentoring is necessary, and various elements of mentoring may come from different people or the same person; team mentoring can help alleviate time limitation issues of each individual mentor
	Mentors should have strong collaboration skills
	Periodic meetings with Scholars and their entire mentoring team are highly beneficial so that everyone on the team is fully informed and their expertise is used
	Mentoring experience: good track record for research and mentoring
	Structured mentoring program with clear and aligned expectations and goals from the beginning; contract or mentoring agreement may be beneficial
	Mentor must be committed to career development of Scholar and provide support to achieve Scholar's goals; mentors must be altruistic to some degree; they cannot expect Scholars to work on the mentor's agenda
	Mentors must have good track record for research and mentoring and must enjoy mentoring
	Institution must ensure that mentors have adequate time, protection, and training to mentor appropriately
	Mentors should be able to receive mentoring training
	Institution must place high value on mentoring
	Protection of Scholar research time by mentor, department, and institution, including percent time and years in program
	Scholars should learn mentoring skills
	Mentor must have good network and expose Scholar to opportunities, including colleagues, resources, leadership possibilities, and grant requests in a timely manner.
	Scholars must be motivated and prepared
	Good mentors must be willing to advise and sometimes mediate when issues arise
Themes of less successful mentorship	Personality clashes
	Mentor or Scholar is not engaged; lack of mutual respect
	Long distance mentor can be risky
	Mentor expects Scholar to support mentor's research
	Mentor expects co-authorship even if not involved in a project
	Lack of compliance with Scholar's need to maintain 75% research time
	Failure to address lack of progress
	Mentor does not have adequate time and resources to mentor
	Poor time management skills for either mentor or Scholar
	Silo* approach to science
	Mentor is junior and needs more first authored articles and may be in competition with Scholar
	Lack of commitment on the part of either Scholar or mentor
Most common challenges	Adequate time for mentors to dedicate to mentoring
	Scholar's openness to mentoring in terms of both content and career mentoring
	Transitions in career and/or location by mentor
	Lack of adequate support for mentor or Scholar
	Poor mesh of personalities or incompatible work styles
	Lack of accountability for either Scholar or mentor
	Poor time management skills for either mentor or Scholar
	Scholar open to mentoring—content and career

*Researchers working in relative isolation within their department or field.

although interviews were also used. Twenty of twenty-nine programs ask Scholars to evaluate their mentor(s), mentors to evaluate the Scholar, and program leadership to evaluate mentoring and Scholar productivity. A minority (5 of 29) reported having mentors self-evaluate their mentoring. As far as frequency of evaluations, 18 of 29 (62%) conduct evaluations of mentoring on a semiannual basis, 9 of 29 (31%) evaluate annually, and 2 of 29 (7%) conduct evaluations quarterly.

Best practices and pearls from BIRCWH programs

Pearls and best practices from BIRCWH programs are summarized in Table 3, and details are presented by program in Table 4. Several themes arose across BIRCWH program pearls (frequencies of mentioned items are shown in parentheses). Pearls specific to mentors included the concepts of team mentoring (18), mentors actively engaging Scholars (19),

TABLE 3. SUMMARY OF PRACTICE/PEARLS IN MENTORING

Domain	Description

Mentor-specific items	Mentor actively engaging with Scholar; good communication; committed to Scholar's career development
	Choosing appropriate mentor based on both interests and personalities/styles
	Specify types of mentors mentioned
	  Career mentor
	  Secondary mentor
	  Primary mentor
	  Health disparities mentor
	  Other
	Mentoring experience: good track record for research and mentoring
	Attention to mentor's needs

Institutional/ program support	Regular meetings
	  with entire BIRCWH community
	  with PI, RD, and PD
	Seminars, workshops, and other learning opportunities
	Research resources readily available
	Mentoring awards and incentives

Scholar and mentor relationship	Regular meetings between Scholar and mentor addressing research content and career issues Ample time allotment and protection for Scholar-mentor meetings If needed, reassign Scholar to new mentor Contract between Scholar and mentor; mutual accountability Prompt feedback
Scholar-specific items	Scholar responsibilities, defined roles Scholar collaborations, peer mentoring Scholars actively engaging with mentor and BIRCWH program Scholar independence; must be motivated and prepared Continual support for Scholar Scholar presentations

BIRCWH, Building Interdisciplinary Research Careers in Women's Health; PD, program director; PI, principal investigator; RD, research director

and choosing the appropriate mentor (11). Pearls specific to Scholars included the importance of peer mentoring among Scholars (8) and having clearly defined roles and expectations for the Scholar (8). A major finding across sites is that programs are increasingly finding success using peer mentoring. Pearls relating to the mentor-Scholar relationship included having ample time allotted to mentoring to promote a strong relationship (7) and mentoring awards and incentives (5). Institutional or programmatic factors that were mentioned among program pearls included promoting regular meetings between mentor and Scholar (12) and provision of workshops, seminars, and learning opportunities (8). Lastly, programs recommended reassigning mentors when necessary, providing prompt feedback early in the relationship (before 6 months), and use of formal mentoring contracts to avoid or address challenges.

Twenty-three of 29 (79%) BIRCWH programs offer mentorship training at their institutions. Among 45 responses to narrative descriptions of formats used for training, the most common formats used were workshops, symposia, or seminars (28), followed by classes or coursework (8), newsletters or virtual materials (6), single lectures (3), toolkits (3), and single occurrences for a resource center, a reference book, and career coaching. All but 1 of the programs that offer training in mentoring target this to both mentors and Scholars, whereas 1 focused exclusively on Scholars.

Discussion

This is the first formal evaluation of interdisciplinary mentoring practices across the national BIRCWH K12 programs. Because the BIRCWH is one of the longest running programs dedicated to interdisciplinary mentoring, understanding common pearls, struggles, and solutions can be very informative to other, similar efforts. Several themes emerged from the experiences of the BIRCWH programs over the years. The most commonly cited factors associated with success included that both mentors and Scholars need sufficient protected time to meet (at least weekly), mentors need to demonstrate mentor altruism, and Scholars need an interdisciplinary and collaborative team mentoring approach, including career mentors as well as sufficiently diverse content mentors.

In terms of factors associated with breakdowns in the mentoring relationship, major issues reported included lack of support for the mentor or Scholar or both, poorly stated or lack of clear expectations, and time constraints. As time pressures and financial pressures continue to increase for faculty, programs and institutions will be looking for mechanisms, tools, education, and organizational structures to support the work and promote the efficiency, productivity, and rewards for mentoring.

Although in the last few years, there has been extensive discussion of eliminating silos* and encouraging interdisciplinarity in science, the importance of mentoring with an interdisciplinary focus in contrast to other types of mentoring has only recently received study.[6] Schultz et al.[7] reported that building interdisciplinary research capacity took deliberate focus and effort on the part of the institution. The Clinical Translational Science Award (CTSA) Consortium recently conducted a semistructured phone survey to assess best practices for the KL2 program (similar to the K12 program) across 46 CTSA sites.[8] Although the two evaluations, CTSA and BIRCWH, differ somewhat in their focus, information from the two provides complementary information about career mentoring and emerging issues. The CTSA survey similarly found that rewards and incentives to recruit and retain qualified mentors were an important factor across institutions. Although, unlike the CTSA survey, we did not specifically ask a question directed at this issue, some BIRCWH programs mentioned institutional commitments to protect time that faculty devote to mentoring and issuing institutional mentorship awards to recognize successful faculty mentoring. The CTSA authors found substantial variability in mentoring practices across sites and limited consensus about the core elements of "effective mentoring practices."[8] In contrast to the CTSA findings, BIRCWH program directors appeared to share many common mentoring practices. BIRCWH

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*Researchers working in relative isolation within their department or field.

TABLE 4. BEST PRACTICES AND PEARLS FROM PROGRAM LEADERS

School BIRCWH PI/PD	Pearls and best practices in mentoring
Boston University K. Freund, M.D., M.P.H. B. Sherman, Ph.D. R. Sillimanm, M.D., Ph.D.	• Teaching Scholars how to become their own advocates through addressing misunderstandings early, role playing, etc. This is a skill set they will need throughout their career. • Help BIRCWH Scholars identify appropriate career mentors vs. research mentors, as they are both necessary for a successful academic career but are typically two different people. • Examples of less successful mentorship include personality clashes, mentor expecting mentee to support his/her research, differing expectations of authorship, and mentee overshadowing the career of the mentor. • May need to review with mentor appropriate roles and responsibilities for mentee • Sometimes it is better for both the Scholar and mentor to sever the mentorship relationship and reassign the Scholar to a new mentor.
Duke University P. Leppert, M.D., Ph.D.	• Annual faculty mentoring awards in basic, translational, and clinical research. • Mentoring record is a factor in promotion and tenure decisions. • Duke mentoring pearls: 1. Mentors model success. 2. Effective mentors help mentee expand vision. 3. Provide mentee a strategy for success. 4. Mentors develop a truthful relationship and assist mentee in finding the truth in all situations. 5. A successful mentor takes effective behavior in the mentee and optimizes it. 6. A successful mentor builds relationships and allows mentee to flourish on own. • Review of Scholars and mentors on a quarterly basis. • Review of Scholars and mentors at the annual advisory board meeting with discussion of productivity.
Harvard University J. Goldstein, Ph.D., M.P.H. U. Kaiser, M.D.	• Each Scholar has a primary mentor, who is either a basic or clinical investigator depending on the interests of the Scholar. The Scholar meets weekly with the primary research mentor. • A secondary mentor is selected as the clinical or basic research counterpart to the primary mentor. The secondary mentor is available to guide the Scholar's thinking in a translational manner through readings, course work, and supervision, depending on the needs of the Scholar. The Scholar meets monthly with the secondary mentor. • In addition, the team includes a career mentor, who ensures that the Scholar understands the departmental academic structure and can move through the system and develop a comprehensive career development plan to facilitate the Scholar's transition to a position as an independent investigator. Scholars meet with the career mentor semiannually. • The team includes a mentor in health disparities. Issues relating to health disparities cross disorders, and thus we have mentors who expose Scholars to thinking about how social/environmental factors may contribute to or modify gender differences in population patterns of disease. Scholars meet with their health disparities mentor quarterly or semiannually. Finally, the BIRCWH PI and RD have a monthly meeting with the Scholars, in addition to twice annual individual meetings with all Scholars to discuss their progress and address individual concerns, with additional meetings as needed.
Mayo Clinic R. Bahn, M.D. V. Miller.,Ph.D.	• A detailed agreement form, completed at the onset of the mentoring relationship, assists both Scholar and mentor in explicitly defining goals and expectations and ensures alignment. Expectations are defined in research, education/training, academic skills, career development and personal conduct. Progress is assessed periodically during mentor/mentee meetings and quarterly during meetings between the BIRCWH Scholar and the PI/PD. • A quarterly seminar series on mentoring is aimed at teaching best practices to mentors. Other sessions focus on the role of the mentee in a successful relationship. The sessions are interactive and often case-based. Outside speakers are invited to discuss approaches that are successful at other institutions. • A monthly lunch meeting (called "Germination") brings together all the BIRCWH Scholars. The PI and PD and members of the BIRCWH Executive Committee or other BIRCWH mentors are invited. This meeting fosters informal discussion around a predetermined topic of interest to the Scholars.
Medical University of South Carolina K. Brady, M.D., Ph.D. J. McGinty, Ph.D.	Innovations in Research Career Development: • BIRCWH Scholars research addictions/mental health and aging/cognitive decline, with basic scientists and academic clinicians represented in both research areas

(continued)

TABLE 4. (CONTINUED)

School BIRCWH PI/PD	Pearls and best practices in mentoring
	• Scholars receive interactive mentoring by two faculty members representing clinical and preclinical disciplines, providing expertise in research and career development. • Comprehensive evaluation plan utilizes biannual formative and summative techniques as well as formal and informal approaches for reviewing and evaluating Scholar progress, mentorship, and program effectiveness. • The entire BIRCWH K12 community attends regular meetings where Scholars discuss their research and cross-disciplinary collaborations are fostered. Fostering Interdisciplinary and Institutional Change: • BIRCWH participants work with MUSC women Scholars initiative to organize and attend seminars/workshops promoting information exchange and interdisciplinary interaction. • Ongoing activities provide review/consultation in biostatistical analysis, research ethics, regulatory issues, human subject protection and privacy issues, and grantsmanship. • Scholars present their data monthly to faculty and trainees of the Specialized Center of Research (SCOR) on sex and gender factors affecting women's health to catalyze interdisciplinary collaboration. • Scholars participate in exchanges with other interdisciplinary research groups at MUSC pertinent to BIRCWH Scholar's chosen research interests, fostering interdisciplinary perspectives and expanding networking opportunities for future collaborations.
Michigan State University M. Nettleman, M.D., M.S., MACP C. Holzman, D.V.M., M.P.H., Ph.D.	• For newly appointed Scholars, waiting until a semiannual evaluation may be too late. Some Scholars only have 2 years on the BIRCWH program, and this is 25% of their time! If there are issues with the mentoring arrangements, they will usually become evident much earlier than 6 months. Therefore, an evaluation at 2–3 months is appropriate for new Scholars. Existing Scholars who have highly functional mentoring relationships need less oversight. • Popular mentors are often asked to mentor numerous junior faculty and trainees. Scholars need skills in assessing and negotiating time with the mentor at the very beginning of the relationship. For some, this may mean being assertive about rescheduling missed meetings or adding additional meetings during times when more mentoring is needed.
Northwestern University, Feinberg School of Medicine M. Urbane, Ph.D T. Woodruff, Ph.D. A. Dunaif, M.D.	The mentoring for the scholars is implemented via a multipronged approach that is tightly integrated with other aspects of career development with the goal of training the next generation of independent investigators in the science of sex differences and in other fields relevant to women's health. Mentoring consists of: • Individualized mentoring provided by the Scholars' mentors. • Group mentoring of the scholars at regular BIRCWH meetings between scholars and BIRCWH PI/PDs. • Peer mentoring as implemented by the manuscript sprints that are organized by the Scholars for the scholars. • Didactic mentoring regarding grant and manuscript writing, navigating the professoriate, and career development through a series of courses and seminars aimed at junior faculty.
Oregon Health & Science University D. Dorsa, Ph.D. J. M. Guise, M.D., M.P.H.	• Scholars have mentoring teams that include clinical and basic science content and methodologic mentors as well as a career mentor, with one assuming the role as primary mentor. • Scholars meet weekly to biweekly with mentors individually and meet periodically with the entire mentoring team. • Scholars have explicit benchmarks for productivity that guide Scholar-mentor meetings. • Scholars and mentors have defined roles and responsibilities. • Interdisciplinary Advisory Committee actively evaluates: mentor team, Scholar productivity and progress, and Scholar/mentor match and suggests additions/revisions. • Peer mentoring among Scholars catalyzes productivity and interdisciplinary collaborations. • We select mentors who facilitate connections and networking for Scholars, advise the Scholar on their choices and help them prioritize their work, and help Scholars problem solve and manage conflict. • OHSU offers ongoing learning opportunities in mentoring through the lead mentor program, career perspectives series, mentor skills workshops, grow from within to excellence website, virtual mentoring pilot.

(continued)

TABLE 4. (CONTINUED)

School BIRCWH PI/PD	Pearls and best practices in mentoring
Pennsylvania State University C. Weisman, Ph.D. K. Kjerulff, Ph.D.	• We use an evidence-based functional mentoring model in which mentors focus on helping Scholars develop specific research skills, complete their BIRCWH research projects, and meet other BIRCWH program milestones (publications, grant submissions). • We use multidisciplinary, cross-campus mentor teams of senior investigators representing at least two disciplines and both campuses that participate in the BIRCWH program—medical campus and main campus; this approach familiarizes Scholars with the different research cultures within the academic environment and expands opportunities for cross-disciplinary collaborations. • The most effective mentors are experienced collaborative researchers who understand the importance of interdisciplinary perspectives, team approaches, and nurturing junior colleagues across disciplines; we strive for mentor teams that include at least one experienced collaborative researcher.
Tulane University A. Warren, M.P.H. C. Johnson, Ph.D., J. Magnus, M.D., Ph.D. M. Krousel-Wood, M.D., MSPH	• We develop the Scholar-specific mentoring program based on the career development plan that assesses knowledge and skills of Scholars at baseline and planned activities to reach career goals. • We provide mentor teams that are individually tailored to complement and enhance the backgrounds and experiences of mentees. • We organize regular meetings with Scholars and the entire mentor team to give input on specific benchmarks for progress toward goals. • We offer specialized mentoring in statistical design and analysis from the women's health resource laboratory director. • We invite program graduates to serve as midcareer-level mentors to provide peer-to-peer guidance. • We continue our support of program graduates, especially clinician scientists, by helping them identify alternative funding sources.
University of California at Davis C. Pomeroy, M.D., M.B.A. E. Gold, Ph.D. N. Lane, M.D.	• Creating mentoring teams that include both research and career mentors. • Mentoring teams for Scholars include mentors from a minimum of two different disciplines, which must be justified by Scholars and approved by the BIRCWH PI/PDs. • Collaborate with faculty development program and newly established Mentoring Academy to provide incentives for engaging in team science and interdisciplinary collaboration by specifically rewarding those who are involved in interdisciplinary mentoring and research projects in the merits and promotions process. • Networking with another regional BIRCWH program, including an annual symposium attended by Scholars and mentors to foster collaboration. • Using innovative technology to visualize research collaboration networks (including publications and grants); we document the evolving research networks of both Scholars and mentors in terms of inter/disciplinary and sustained research focus on women's health. Our tools allow us to use the network data to track program and participant success over time.
University of California, San Francisco (UCSF) M. Gandhi, M.D., M.P.H.	• Mentor/mentee should meet face to face at least monthly. • Mentors and mentees should answer emails from each other within 2 business days. • Mentees should send an email prior to each meeting summarizing the goals of the meeting, progress to date, and what she/he hopes to move forward. Mentee should then send an email after each meeting thanking the mentor for the conversation and summarizing the key points. • Mentor should have goal to introduce mentee to at least one key collaborator in the field at a major meeting yearly as well as try to encourage program planning committees to invite the mentee to give a summary presentation. • Mentors should demonstrate a diverse and independent portfolio of research funding before joining the BIRWH mentorship pool.

(continued)

TABLE 4. (CONTINUED)

School BIRCWH PI/PD	Pearls and best practices in mentoring
	• Because the mentor/mentee relationship is actually mutually beneficial, the mentor should display generosity of spirit and the mentee should display appreciativeness and acknowledgment throughout the interaction. • We provide each mentor with a BIRCWH-appointed career mentor independent of the research mentor. We also host a monthly seminar series for the scholars, which includes career-focused workshops in addition to didactic and research talks in women's health.
University of Cincinnati J. Tsevat, M.D., M.P.H. M. Yi, M.D., M.Sc.	• Vetting of prospective primary mentors for BIRCWH Scholars to be appointed to the cadre of mentors, using a rigorous review process in order to maximize the potential for a successful mentor-mentee relationship. • Confirmation that the mentor's department/division guarantees at least 5% protected time to serve in this role. • Active promotion of team science so that multiple experienced faculty members from different departments and disciplines are invested in the Scholar to ensure the successful career of the young investigator. • Training programs for current mentors and for faculty ready to transition into mentorship roles. • Full access for BIRCWH Scholars and their mentors to the research resources provided by our institution's CTSA (entitled Center for Clinical and Translational Science and Training [CCTST]) to facilitate their collaborative journey to research independence. • BIRCWH mentors are also appointed as CCTST Scholars, which gives them 5 extra free (transferable) hours of Research Central support
University of Colorado Anschutz Medical Campus J. Regensteiner, Ph.D. M. Neville, Ph.D. J. Zerzan, M.D.	• Good matching of Scholars and mentors is very important. If a mentor-Scholar pair is not working out, possible change in a mentor should be investigated. • Our BIRCWH program has an interdisciplinary team mentoring approach. This approach is very important to our success. • Regular meetings for Scholars with mentors (at least weekly for the primary mentor) are critical. • Providing mentoring training is of great value to both Scholars and mentors. • Twice yearly BIRCWH meetings for each Scholar where Scholars present their work to all their mentors, followed by discussion of progress and goal setting, are very important. More frequent meetings for BIRCWH leadership with Scholars (in addition to weekly meetings between primary mentors and scholars) are also important, as careful attention by BIRCWH leadership to Scholar and mentor issues is essential for success. Careful program evaluation is very critical to success. Having an unbiased person run the evaluation program is very important in order to preserve objectivity.
University of Illinois at Chicago S. Geller, Ph.D. P. Maki, Ph.D. T. Hughes, Ph.D. A. Koch, M.A.	We believe that successful mentorship begins with recognition that junior faculty have a wide array of needs, such as professional development, advocacy and support, access to opportunities and professional networks, an intellectual community, accountability, safe space, assistance with maintaining work/life balance, and role models. Successful mentorship at UIC includes: • Team mentoring approach that pairs Scholars with at least two mentors plus a BIRCWH program advisor. • Structured mentoring program with clearly defined responsibilities and expectations for Scholars and mentors, supported by close oversight from BIRCWH program advisors. • Monthly group meetings of Scholars and mentors that address research and career development topics while fostering interdisciplinary communication and a supportive peer network among Scholars. • Active engagement of Scholars in identifying their needs and working with their mentors to meet them. • Attention to mentors' needs (mentoring the mentor initiative) and recognition that mentor engagement is the greatest facilitator of a successful mentoring relationship.
University of Kansas Medical Center P. Thomas, M.D. S. Carlson, Ph.D.	• Scholars select two to three mentors from an existing panel of approved faculty or suggest their own. • Prior to approval, mentors must have established research programs in areas relevant to women's health and demonstrate significant mentoring experience. • Mentor/Scholar relationships are informally evaluated by BIRCWH program administrators at routine monthly meetings to detect potential conflicts early.

(continued)

TABLE 4. (CONTINUED)

School BIRCWH PI/PD	Pearls and best practices in mentoring
	• Our KUMC campus recognizes outstanding mentoring relationships with annual awards. • Collaborations among Scholars, both past and present, create a safe environment to share innovative ideas and apply for interdisciplinary grants. • BIRCWH-sponsored lecture events allow Scholars access to mentoring experiences from senior scientists around the world. • Scholars are encouraged by mentors to follow career paths in which they are passionate. Grant writing should be focused to research in which genuine, self-motivated interest exists.

University of Kentucky
T. Curry, Ph.D.
C. Martin, M.D.
A. Coker, Ph.D.
	• Engaged mentor.
	• Engaged Scholar.
	• Dedicated time for mentor/Scholar interaction.
	• Different mentors for different situations.
	  Scientific mentor
	  Personal mentor
	  Discipline specific mentor
	  BIRCWH specific mentor
	• Scholar who respects and values the mentor's time, advice, and insight.

University of Maryland Baltimore
P. Langenberg, Ph.D.
I. Merchenthaler, M.D., D.Sc.
	• Frequent and close contact.
	• Clear expectations for the mentor-mentee relationship.
	• Regular evaluation of mentoring relationships.
	• Emerging independence of Scholars is the best measure of success.
	• Good mentors are good role models who set a good example.
	• Good mentors expand the mentee's world through:
	  Introducing mentee to his/her professional networks.
	  Recommending mentee for review of grants and manuscripts.
	  Guiding through the grant process.

University of Michigan S. Domino, M.D., Ph.D. T. Johnson, M.D.	• A senior research mentor is needed for grounding in a scientific discipline. • An interdisciplinary mentor outside one's field of training broadens scientific vision. • A career development mentor assures progress toward promotion. • Develop additional mentoring relationships over time to form a mentor quilt. • Include a work-life balance mentor whom you admire for personal support. • When working with mentors, be aware of differences in communication style; i.e. some mentors work best with the big picture, whereas others can help with protocol details. • Appreciate in yourself your own communication style: how you make decisions, what motivates you. • Develop personal habits of time management, make internal deadlines and keep them. • To achieve scientific independence, differentiate your career from your primary mentor's research area. • As you build your own unique research team, plan ahead to lead your group, including policies on collaboration, evaluations, journal club and research meeting, authorship, deadlines, data notebooks, and research ethics.
University of Minnesota N. Raymond, M.D. J. Wyman, Ph.D.	• Meetings between the Scholar and the primary mentor at least every other week and preferably weekly. Mentoring relationships in which the primary mentor is overcommitted and less engaged are associated with slower progress on the part of the Scholar. • A Scholar meeting with her entire interdisciplinary team at least quarterly is associated with Scholar success. These meetings lead to new approaches to research, better supervision of progress, and new research collaboration opportunities with the Scholar and between mentors.

(continued)

TABLE 4. (CONTINUED)

School BIRCWH PI/PD	Pearls and best practices in mentoring
	• Willingness of the Scholar to take advice and direction from the mentors and the BIRCWH PI and PD. Scholars who tend to continue in a direction when mentors have advised considering a different course have found that the manuscript or grant reviewers give them the same feedback they already received at their own institution. • Use of the BIRCWH career development plan tool and adherence to the U of M BIRCWH program benchmarks. These tools as tools assist the team in assessing their Scholar's progress and productivity.
University of North Carolina at Chapel Hill E. Orringer, M.D. K. Boggess, M.D.	• Strive to assist Scholars to select mentors with compatible work styles and goals for the mentoring relationship. • Clearly describe program goals and timelines to both mentors and mentees. • Develop a community of Scholars consisting of other early-stage researchers who are proceeding along a similar track as BIRCWH Scholars. Engage the group in peer-to-peer mentoring by holding routine meetings to discuss research progress, strategize on next steps, and assist with problem solving. • Be flexible and adapt your mentoring expectations to the needs and level of the Scholar. • Adopt a village approach, in which Scholars benefit from input not only from the research mentors but also from program leaders and other scientists who model the behaviors of successful researchers. • Maintain active involvement of former BIRCWH Scholars within the program. These Scholars are ideal role models for current Scholars and offer different perspectives from more established researchers.
University of Pittsburgh J. Roberts, M.D. M. Broido, Ph.D.	• We believe mentoring is successful only when the mentor makes a firm commitment to and is motivated by the future success of the Scholar. • Evidence of commitment is the mentor meeting with the Scholar, even before the Scholar has been chosen, to draw up a career development plan. • There is no substitute for regular, scheduled meetings of mentors and Scholar. For the primary mentor, this should be at least weekly, for secondary mentors monthly, and for the team together quarterly. • The mentor must be present when the Scholar is evaluated to provide input and to be assessed herself. • We believe for mentoring team to work as a team, the number must be limited. In most circumstances, this will be three mentors, with additional mentors serving as consultants. • We encourage peer mentoring by the Scholars. • Scholars are encouraged to act as mentors for residents, fellows, and students and to take part in the CTSI courses on mentoring. Knowing the qualities of a good mentor facilitates Scholar's evaluation of the mentor.
University of Rochester D. Cory-Slechta, Ph.D. E. van Wijngaarden, Ph.D.	• PI/PD and advisory committee provide guidance on grant and manuscript presentations, oral presentation skills, management and leadership of independent research programs. • Individual quarterly meetings of each Scholar with the PI and PD to provide mentorship and guidance and to discuss how the BIRCWH program could best assist in their career development. • Scholars are encouraged to take advantage of existing didactic programs. • Scholars receive interactive mentoring by two faculty members representing different disciplines. • The interdisciplinary advisory and mentoring committees provide multidisciplinary feedback on Scholars' research progress on a regular basis. • Scholars are encouraged to conduct peer-to-peer publication review, which facilitates discussion among Scholars. • Provide opportunities for Scholars to give oral presentations at grand rounds or other research seminars across the medical center. • Provide technical support to Scholars in statistical analysis, study design, design of data collection instruments, and maintenance of study databases.
University of Texas Medical Branch A. Berenson, M.D., Ph.D., M.M.S. J. Freeman, Ph.D.	• Each Scholar has one BIRCWH program mentor and two research mentors. The BIRCWH mentors offer guidance on career development strategies and ensure compliance with program and federal requirements. The research mentors offer guidance on the science.

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TABLE 4. (CONTINUED)

School BIRCWH PI/PD	Pearls and best practices in mentoring
	• Mentor/Scholar matches begin with a tentative match prior to applicant's campus interview. The PI/PD sends promising applicant CVs to potential mentors in a particular research focus area. After mentors indicate interest in an applicant, a phone interview is arranged with participation by BIRCWH administration and potential mentors. At the next level, potential mentors and potential Scholars interact during a campus interview and a seminar presentation by the applicant. If these interactions promise a successful experience for both, an offer is made to the applicant.
	• Postappointment, adjustments in Scholar/mentor arrangements may be made if either finds that a good fit was not achieved in the initial matching process. The BIRCWH administration meets regularly with individual Scholars to monitor the progress and quality of the Scholar/mentor relationship. If problems arise, the BIRCWH administration may intervene early and negotiate ways to improve the relationship or to broker new mentor teams. The need for adjustment has been rare because the preappointment process has been very successful.
	• Postappointment, the BIRCWH administration meets regularly with all the Scholars as a group. This meeting offers an additional opportunity for assessing the progress and quality of the Scholar/mentor relationship. Also, Scholars receive suggestions from peers.
University of Wisconsin, Madison G. Sarto, M.D., Ph.D.	• Each Scholar has two mentors. Ideally, one mentor will be from a biomedical research field and the other from a behavioral/social science field. If needed, the leadership team and proposed primary mentor help the Scholar select a secondary mentor as needed.
	• Mentors apprentice Scholars (mentor in planning of research, analysis of data, preparation of presentations, writing of manuscripts, formulation of hypotheses for future research, grant writing, and advice on attaining short, intermediate, and long-term career goals).
	• Mentors meet with Scholar and the BIRCWH PI within the first 1–2 months.
	• Mentors are asked to sign off on the Individualized Learning Plan developed with the PI for each Scholar to indicate their agreement and support of the curriculum recommendations.
	• Mentors sign a mentoring contract that verifies their commitment to the BIRCWH Scholar and specifically states that 75% of the Scholar's time will be devoted to research-related activities.
	• Mentors attend yearly BIRCWH advisory committee meeting and participate in annual half-day Evaluation Retreat.
	• Twice per year, mentors complete an evaluation of the Scholar, and their evaluations are discussed in a face-to-face meeting of the Scholars, mentors, and PI.
	• Mentors may be changed during the program to best meet the scholars' research and career development needs.
Vanderbilt University K. Hartmann, M.D., Ph.D. N. Brown, M.D.	• Guide faculty Scholars in constructing mentoring teams including a primary research mentor, research co-mentor, career/departmental mentor, member of the program leadership, and others with specialized expertise or resources salient to the Scholars' work.
	• Use a mentoring contract to make plans for interacting and feedback clear, discuss preferred modes of communication, and set and record goals together.
	• Require twice annual meetings of mentoring teams with formal progress reports while strongly encouraging frequent regular contact.
	• Place expectations on mentors that their success is defined in part by their being a sounding board for their Scholar, assisting with problem solving, clearing barriers, identifying additional resources, and coaching on practical aspects of academic life.
	• Establish a clear sense of norms for the pace of productivity most highly correlated with success; guide the Scholar in establishing and committing to effective timelines to keep the pace.
Virginia Commonwealth University J. Strauss III, M.D., Ph.D.	• Team mentoring is the primary approach. It is important to establish goals. The team approach provides for mentors with different strengths in content and experience to mentor one Scholar.
	• The team members and Scholars commit to at least one formal interaction per month. Time should be set aside for the mentoring relationship and honor all appointments for informal interactions.

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TABLE 4. (CONTINUED)

School BIRCWH PI/PD	Pearls and best practices in mentoring
P. Coney, M.D. S. Spiegel, Ph.D.	• Team members must commit to take an active role in the mentoring process. • Team members must be flexible on meeting times, medium and places for Scholar interaction outside the formal meetings. • The team fosters creativity and independence, provides honest and timely feedback to the Scholars, does not criticize, give advice on everything and does not encourage total dependence on the team. • Team members should make every effort to provide opportunities for the Scholars.
Washington University School of Medicine C. Semenkovich, M.D. T. Baranski, M.D., Ph.D.	• The WU BIRCWH program provides a pool of mentors specifically chosen for research relevant to women's health and an outstanding track record of mentoring young scientists. • The career development committee consists of the BIRCWH PD and three mentors to provide big picture advice regarding the direction of each Scholar's research program, grant applications, and manuscript preparation. The Scholar is encouraged to include the department chair(s) to facilitate discussion of activities that will impact promotion. • The Scholars are encouraged to host visiting professors with whom they share research interests and who can serve as potential outside mentors for their career development. Funds are provided to each Scholar for this activity. • Scholars are required to attend the national BIRCWH meeting. This is an invaluable opportunity for Scholars to gain a broader perspective on mentoring at other institutions. This has been consistently rated highly by our Scholars.
Yale University School of Medicine C. Mazure, Ph.D. S. Ball, Ph.D.	• Scholars develop an individualized written career development plan in collaboration with a primary and secondary mentor (from different disciplines), PI, and PD. The plan includes description of proposed research with a projected timeline, short/long-term goal setting/accountability, and regular meetings to assess progress and revise plan as needed. • Mentor/Scholar dyads evaluate their interactions in a structured format biannually; PI and PD meet with each to discuss strengths, challenges, and career development goals. • Each Scholar meets biweekly with the PD, a trained professional coach specializing in faculty career development. Interactions emphasize completion of writing tasks, planning/execution of specific projects, transitional adjustment to roles, professional growth and emerging independence, life balance, and sustaining mentoring relationships. • Each Scholar has a 6-session laboratory mentoring experience in the mentors' laboratories. Topics include on-site mentoring, developing a mentoring philosophy, goals and expectations, challenges and issues, communication styles, evaluation methods. • The team science advisor leads small cohorts of Scholars, mentors, and other faculty from different disciplines in interdisciplinary team science work groups that promote Scholar career development by identifying common concepts across different disciplines that can be used in research, understanding different methods to investigate a phenomenon of interest, and facilitating scientific interactions on a specified topic. • An advisory committee, including accomplished researchers from other universities, provides guidance and counsel for Scholar and program development.

CTSA, Clinical Translational Science Award; CTSI, Clinical and Translational Institue.

programs over time appear to have identified similar elements for mentorship that include (1) an average of three mentors, one of whom would be a career mentor and at least two other content mentors that differ in their specialty, (2) a primary mentor who meets at least weekly with the Scholar, (3) explicit statement of expectations and roles of mentors and Scholars from the beginning of their work together (often in the form of written contracts), (4) at least annual evaluation from Scholar, mentor, and program leadership, (5) programmatic evaluation to ensure that mentors support the research independence, networking, and other needs of Scholars, and (6) the emergence of educational programs and tools to support the mentorship work of mentors and Scholars.

As highlighted by Domino et al.,[9] the BIRCWH program allows one of the most longitudinal looks at the interdisciplinary mentoring approach. Over time, the BIRCWH programs nationwide appear to have embraced common themes in supporting and evaluating interdisciplinary mentoring at the individual, program, and institutional levels. However, there are limitations to the current report. We are not able to connect particular interdisciplinary mentoring elements identified by BIRCWH programs directly with successful outcomes. Nevertheless, it is notable that BIRCWH programs have been highly successful; 2011 NIH research project grant funding data reveal that 38% of R01 applications submitted by BIRCWH Scholars were funded. This is higher than the overall NIH research project grant success rate of 29.3%.

Success for a BIRCWH Scholar can be measured by many different variables, and future studies may build on these data to further explore the relationships between specific mentoring practices and research independence outcomes more directly. This article is written from the perspective of PIs and PDs, and it is not known if providing Scholars with multiple mentors creates an added burden to Scholars, although that did not emerge as a finding from any of the reports of the Scholar/mentor relationship. It is also worth noting that in the majority of BIRCWH programs, there is a designated primary mentor who works with the scholar to oversee the overall functioning of the interdisciplinary team. Another issue is that the best practices and challenges reported across programs may not take into account other activities that support mentoring within a given institution.[10–13] Because organizational culture certainly can influence the cultivation of interdisciplinary science, this is another dimension that would be interesting to study.

Although it is certainly challenging to quantify the effectiveness of mentoring, especially at the individual level, any faculty member can speak to the importance of mentors to their careers, and institutional leaders can speak to the importance of good mentoring to attract highly qualified students and faculty. This reflection of a highly successful national research mentoring program provides a unique glimpse into common practices that academic institutions have found successful to cultivate the next generation of interdisciplinary research leaders. This information may be relevant not only for women's health but also for other fields and disciplines.

Disclosure Statement

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References

1. Leshner AI. Science at the leading edge. Science 2004;303:729.
2. McCarthy J. Tackling the challenges of interdisciplinary bioscience. Nat Rev Mol Cell Biol 2004;5:933–937.
3. commonfund.nih.gov/about.aspx
4. Pinn VW. Research on women's health: Progress and opportunities. JAMA 2005;294:1407–1410.
5. Pinn VW, Blehar MC. Interdisciplinary women's health research and career development. In: Rayburn WF, Schulkin J, eds. Changing landscape of academic women's health care in the United States. International Library of Ethics, Law and the New Medicine 48. New York: Springer, 2011:53.
6. Heller C, de Melo-Martín I. Clinical and Translational Science Awards: Can they increase the efficiency and speed of clinical and translational research? Acad Med 2009;84:424–432.
7. Schultz D, Keyser D, Pincus HA. Developing interdisciplinary centers in aging: Learning from the RAND/Hartford Building Interdisciplinary Geriatric Health Care Research Centers initiative. Acad Med 2011;86:1318–1324.
8. Silet KA, Asquith P, Fleming MF. Survey of mentoring programs for KL2 Scholars. Clin Transl Sci 2010;3:299–304.
9. Domino SE, Smith YR, Johnson TR. Opportunities and challenges of interdisciplinary research career development: Implementation of a women's health research training program. J Womens Health 2007;16:256–261.
10. Sambunjak D, Straus SE, Marusic A. A systematic review of qualitative research on the meaning and characteristics of mentoring in academic medicine. J Gen Intern Med 2010;25:72–78.
11. Pololi LH, Knight SM, Dennis K, Frankel RM. Helping medical school faculty realize their dreams: An innovative, collaborative mentoring program. Acad Med 2002;77:377–384.
12. Pololi L, Knight S. Mentoring faculty in academic medicine. A new paradigm? J Gen Intern Med 2005;20:866–870.
13. Keyser DJ, Lakoski JM, Lara-Cinisomo S, et al. Advancing institutional efforts to support research mentorship: A conceptual framework and self-assessment tool. Acad Med 2008;83:217–225.

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