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UNDERSTANDING THE IMPACT



EVALUATING THE POSTDOCTORAL FELLOWSHIP AWARDS

California
Breast Cancer Research Program

A PRELIMINARY REPORT

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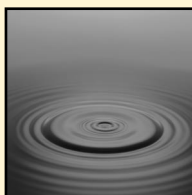


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BACKGROUND

The mission of the California Breast Cancer Research Program (BCRP) is to reduce the impact of breast cancer in California by supporting research on breast cancer and facilitating the dissemination of research findings and their translation into public health practice. Founded in 1993, when breast cancer activists joined forces with scientists, clinicians, legislators and University of California officials to seek passage of the Program's enabling legislation, BCRP was designed to push breast cancer research in new, creative directions. Funded primarily by a California state tax on tobacco, the BCRP has provided over \$110 million in research funds to investigators throughout California.

The Breast Cancer Research Council, which is an advisory committee to the BCRP, provides vision, sets research priorities, conducts a programmatic review of submitted applications, and makes funding recommendations. BCRP funds research across a broad spectrum of disciplines, including basic science, clinical sciences, public health sciences and technology development. A variety of awards are available, including career development awards. Postdoctoral fellowship awards are one of three career development awards meant to attract and train the most talented breast cancer researchers in California.

Postdoctoral scholars or “postdocs” are a group of scientists-in-training that is increasing in both number and importance. According to data gathered by the National Science Foundation, the number of postdocs nearly tripled during the period from 1979 to 1997, from just under 14,000 to 38,050.¹ Postdoctoral scholars enter into a short-term agreement with an institution, doing research with a mentor that is intended to prepare them for a long-term professional research career. Postdoctoral appointments have quickly become the norm. In many fields, undertaking one postdoctoral appointment, if not more, has become essential to a continuing career path in research.

In the United States, women hold 37.4 % of all postdoctoral positions, a percentage that has remained relatively unchanged since the early 1980s.¹ In 1997, there were 1,242 minority postdoctoral scholars, who made up 5.5% of the U.S. postdoctoral population.¹ In 1998, slightly more than half of all postdocs in the U.S. were international scholars without permanent residency.¹

Since 1995, BCRP has awarded 94 postdoctoral fellowship awards totaling almost \$6.4 million. Awards are given to individuals with doctoral degrees to obtain postdoctoral research training in a field of breast cancer with a designated mentor, for up to two years at \$40,000 per year.² The primary goal of the postdoctoral fellowship award program is to draw talented new researchers into breast cancer research.

In 1999, the BCRP staff and Council created a committee to develop a formal evaluation of the impact of BCRP's funding efforts. The evaluation of the postdoctoral fellowship award

¹ *Enhancing the Postdoctoral Experience for Scientists and Engineers: A Guide for Postdoctoral Scholars, Advisers, Institutions, Funding Organizations, and Disciplinary Societies.* (2000). National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. Committee on Science, Engineering, and Public Policy. Washington, DC: National Academy of Sciences Press.

² During Cycles I-V, BCRP awarded up to \$35,000 for 2 years to postdoctoral fellows.

program represents the first major evaluation of outcomes from BCRP funded research. As a pilot study for the larger on-going evaluation, we hope to gain insight into the impact of our funding as well as critical insight into how to measure outcomes of our funding efforts. This preliminary report focuses on assessing outcomes from the first four years of the postdoctoral fellowship award program.

GOALS OF THE STUDY

The primary goals of this study are three-fold:

- To assess the outcomes of the first four funding cycles of the CA BCRP postdoctoral fellowship award program;
- To improve the BCRP postdoctoral fellowship award program; and
- To conduct a pilot study for the larger on-going evaluation of BCRP's funding efforts.

EXPECTED OUTCOMES

To guide the evaluation process, the BCRP staff and Council evaluation committee drafted evaluation models that articulate expected outcomes from BCRP's funding efforts. Seven models have been developed focusing on each major BCRP funding activity, including the focus of this study: career development and the need to recruit new investigators and retain experienced investigators in breast cancer research. The other six models will be used to guide future evaluations. These models identify the problems addressed by BCRP funding efforts; resources needed to address these problems; and expected short, intermediate and long-term outcomes from BCRP's funding efforts. The evaluation of the postdoctoral fellowship awards was framed by the following expected short and intermediate outcomes:³

1. High quality researchers from a wide variety of disciplines will submit proposals of relevance to breast cancer;
2. BCRP funding will help to develop the careers of the recipients;
3. New researchers will be recruited into the breast cancer field;
4. Experienced breast cancer researchers will be retained in the breast cancer field; and
5. Promising new avenues of breast cancer research will be created and continued.

³ Although BCRP's focus is to accomplish the Program's mission, we recognize that progress toward this mission may best be evaluated through the systematic tracking of short term and intermediate outcomes.

METHODS

The BCRP evaluator conducted eight exploratory interviews with BCRP postdoctoral scholars from funding cycles I-IV⁴ to focus the evaluation and create answer choices for the close-ended questions in the larger survey. After the exploratory interviews were conducted, the BCRP evaluator and the evaluation committee designed a survey consisting primarily of close-ended questions that could be administered over the phone or via email. The questions covered the current career or employment of the postdoc, the impact the BCRP award had on their career, outcomes from the research conducted with BCRP funds, and commentary from respondents about BCRP. The survey was pilot tested and minor changes were made before implementation.

BCRP evaluation staff gathered updated contact information, sent initial contact letters via email (when available), and called each potential respondent to explain the study further and to arrange a telephone interview. Six respondents living overseas were asked to respond to the survey via email. Seven respondents living in the U.S. also chose to respond via email. Telephone interviews lasted between 15 and 30 minutes. When necessary, the staff evaluators contacted the respondent's previous mentor or colleagues to confirm or complete data given by the respondent.

Eligibility for the study consisted of the following criteria:

- Awarded postdoctoral fellowship from BCRP during cycles I-IV (1995-1998)
- Accepted award
- Utilized at least one year of funding

During BCRP's funding cycles I-IV, 49 postdoctoral awards were given to 48 individuals. Of those 48 people, six people returned the award before they used one year of funding so they are not eligible for the study. Of the 42 eligible respondents, BCRP evaluation staff were able to contact and conduct interviews with 39 people. Thus, the study has a 93% response rate.

⁴Cycles I-IV occurred during 1995-1998. Awards given in the fourth cycle typically ended 6/2000.

FINDINGS

BCRP invested almost \$3 million in the 49 postdoctoral fellowships awarded during Cycles I-IV. This represents approximately 5% of the total dollars awarded during these first 4 years of the program. In terms of the number of awards, the postdoctoral fellowship awards comprised about 21% of the total number of grants awarded (49 of the 226 grants) during cycles I-IV (1995-1998). On average, it has been about 2½ years since the respondents completed their BCRP-funded postdoctoral research.

I. Description of the Sample

BCRP evaluation staff interviewed 39 of the 42 eligible respondents. Data were gathered on gender, ethnicity, priority area of the grant, and the institution and dollar amounts invested in the respondents. Sixteen or 41% of the sample were female, and 67% were Caucasian, 28% were Asian, and 5% were Latino/Hispanic/Chicano. Twenty-three of the respondents' grants were in pathogenesis, five in the etiology of breast cancer, and four grants focussed on discovering better treatments for the disease. Three of the respondents sought to better understand socio-cultural, behavioral and/or psychological issues relevant to breast cancer and three grants were aimed at finding ways to detect breast cancer at an earlier stage. One respondent worked in the area of prevention of breast cancer. The 39 postdoctoral awards were given to 13 different institutions with the top six institutions being: Lawrence Berkeley National Laboratory (LBNL); University of Southern California (USC); University of California, San Diego (UCSD); The Burnham Institute; The Scripps Research Institute, and Stanford University (see table 1).

TABLE 1

BCRP Postdoctoral Funds Invested by Institution:
Funding Cycles I-IV (1995-1998)
N=39

INSTITUTION	# OF GRANTS	TOTAL \$ AWARDED*
Lawrence Berkeley National Laboratory	7	\$469,108
University of Southern California	6	421,204
The Burnham Institute	5	377,792
Stanford University	4	273,716
Scripps Research Institute	4	266,174
University of California, San Diego	4	211,380
Salk Institute for Biological Studies	2	150,490
University of California, Los Angeles	2	138,694
University of California, Irvine	1	83,849
University of California, Davis	1	75,000
California Pacific Medical Center	1	73,185
University of California, Santa Cruz	1	70,000
University of California, Berkeley	1	69,981

* These figures include 8% indirect costs given to non-UC institutions.

FIGURE 1

Demographic Information of Respondents

N=39

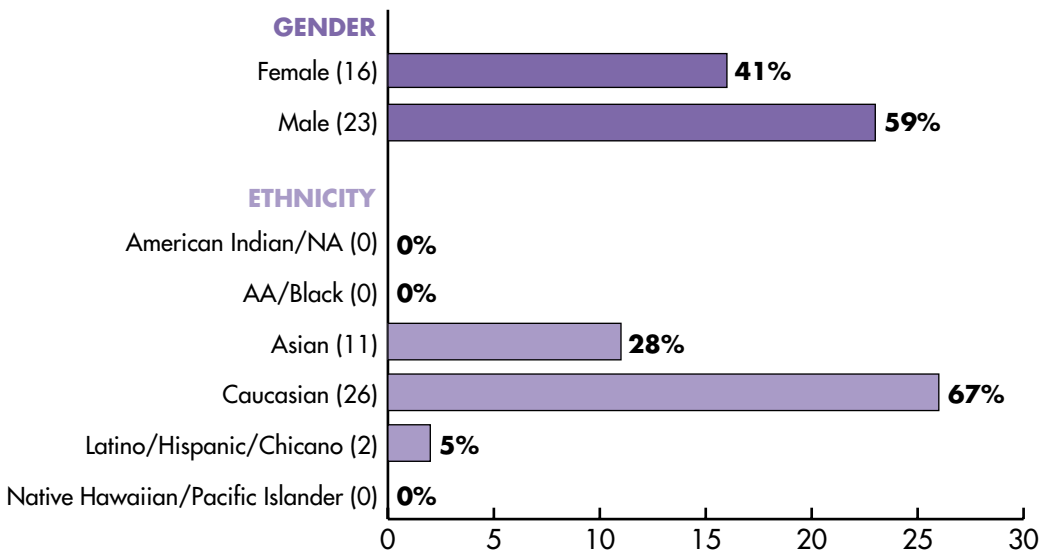
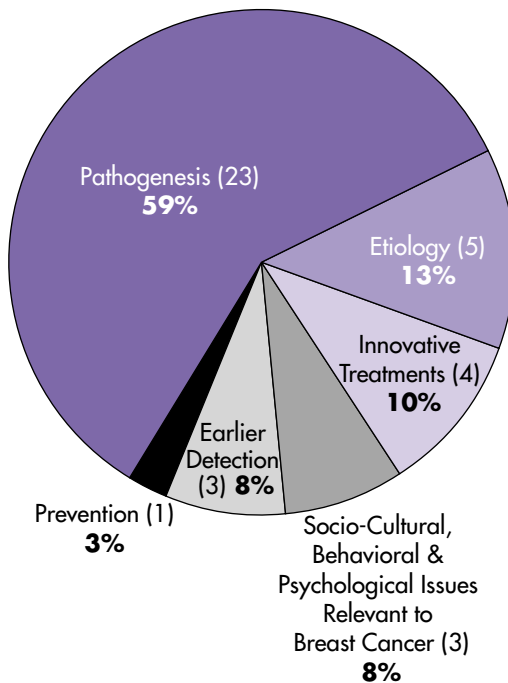


FIGURE 2

Number of Respondents by Priority Area of Grant

N=39



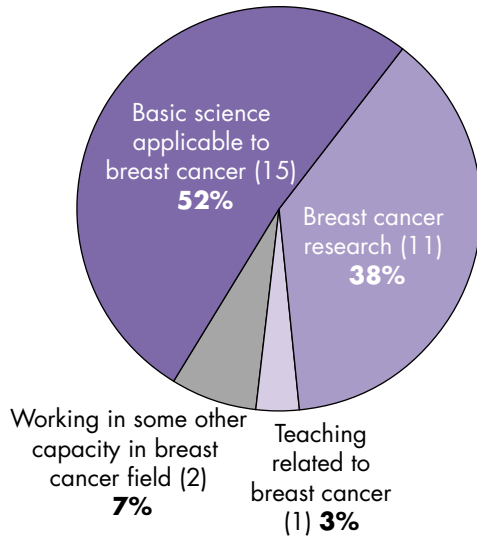
II. Current Career and Employment of Respondents

The first area of the survey pertained to the current career of the respondents. Primarily we were interested in whether or not the postdoctoral scholars are still conducting breast cancer research. Twenty-six of the 39 respondents or 67% are currently conducting breast cancer research. An additional three respondents are either teaching in some way related to breast cancer or working in another capacity in the breast cancer field (e.g. advocacy). Of those still working in the breast cancer field, over 60% are spending between 50-100% of their work time focussing on breast cancer (see figure 4). Over one quarter of these respondents felt that without the BCRP fellowship, they would not still be in breast cancer research.

FIGURE 3

Type of Breast Cancer Work Done by Respondents Still in the Breast Cancer Field

N= 29

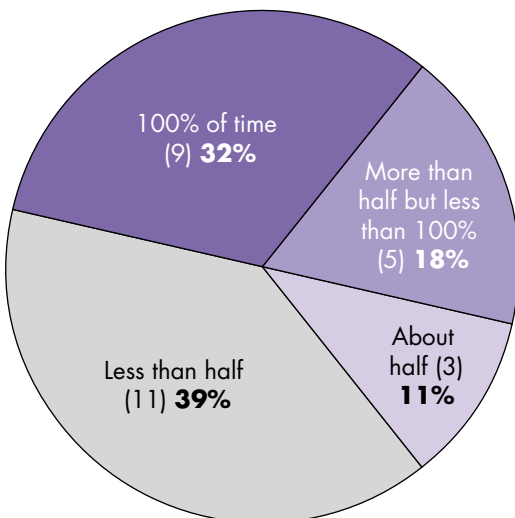


67% of respondents are still conducting breast cancer research.

FIGURE 4

Respondents Still in Breast Cancer Field: Percent of Work Time Devoted to Breast Cancer Work

N=28*



*one respondent did not answer this question

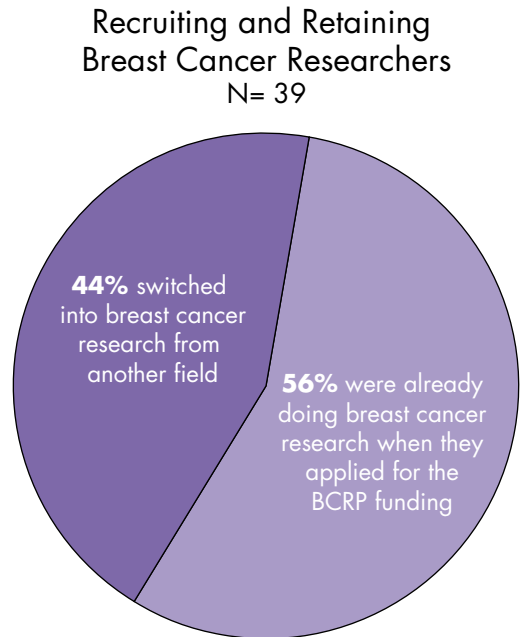
When surveying those who are not currently doing any type of breast cancer research, we found that all of them are still involved in research or science related activities. Four are doing another type of cancer research while the remaining six are either teaching, involved in another type of scientific research, or in business development for a biotech firm. Respondents gave various reasons for leaving breast cancer research including job opportunities, reaching a dead end in their research, and wanting to commit more time to their family.

III. Impact of BCRP Fellowship Award on Career

The next area of the study addressed the impact of the BCRP fellowship award on the postdoctoral scholar's career. We were interested in:

- whether or not scholars used the award to switch into breast cancer research from another field;
- whether or not the award gave them the opportunity to do research in breast cancer that they would not have otherwise been able to do;
- whether or not the award helped them to stay in breast cancer research and if so, how did it help them to stay; and
- what career gains, if any, they received from their BCRP funded postdoctoral training.

FIGURE 5



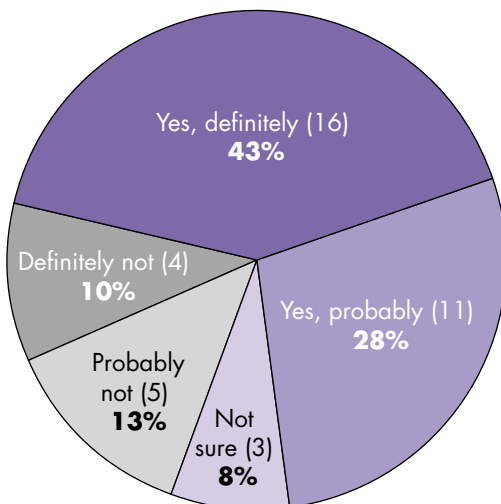
When asked whether or not they used the BCRP award to switch into breast cancer research from another field, 44% (17 of 39)

of the respondents said yes. The remaining 56% (22 of 39) were already doing research related to breast cancer when they applied for the funding. For those that were new to the field, some said that it is difficult to switch into a new field and BCRP provided them with a much-needed opportunity to gain background in breast cancer research to continue in the field. Indeed, of the 17 who switched into the field, 71% (12) have remained, at least partially, in breast cancer research.

FIGURE 6

Did the BCRP award give you the opportunity to do work relevant to breast cancer that you would not have otherwise been able to do?

N= 39



Opportunity

Over 70% of the respondents (27 of 39) felt that the BCRP postdoctoral fellowship gave them the opportunity to do work relevant to breast cancer that they would not otherwise have been able to do. Although we did not specifically ask for comments related to this question, some respondents said that without the BCRP funding, their project would have taken much longer to get funded or would not have been funded at all. Several said that the type of research they wanted to do was too risky for other funding agencies to fund an initial project.

"I felt that [BCRP was] willing to take a risk with me. That made it possible for other places to take a risk on me too."

Staying in Breast Cancer Research

Over 60% of the respondents (24 of 39) said that the BCRP fellowship helped them to stay in breast cancer research once their fellowship award ended. When asked how the BCRP fellowship helped them to stay in the field, almost all of the respondents or 92% (22 of 24) said that it gave them the chance to write and publish papers; 84% (20 of 24) said it provided groundwork for the rest of their career; 79% (19 of 24) said that it gave them the background and training they needed; and 71% (17) said that it helped them to continue working on an already initiated project (see figure 7). Other reasons given include: the BCRP

fellowship award made them more competitive to obtain additional funding in breast cancer;

it helped steer their career towards breast cancer research; and the award gave them breast cancer specific training.

Furthermore, respondents who are currently in the breast cancer field were asked if they would still be in breast cancer research had they not received their BCRP award. While 66% said they would either probably or definitely still be in the field, 27% said that they would not have stayed in the field if they had not received the BCRP postdoctoral award (see figure 8).

FIGURE 7

How did the BCRP fellowship award help you to stay in breast cancer research?

N=24

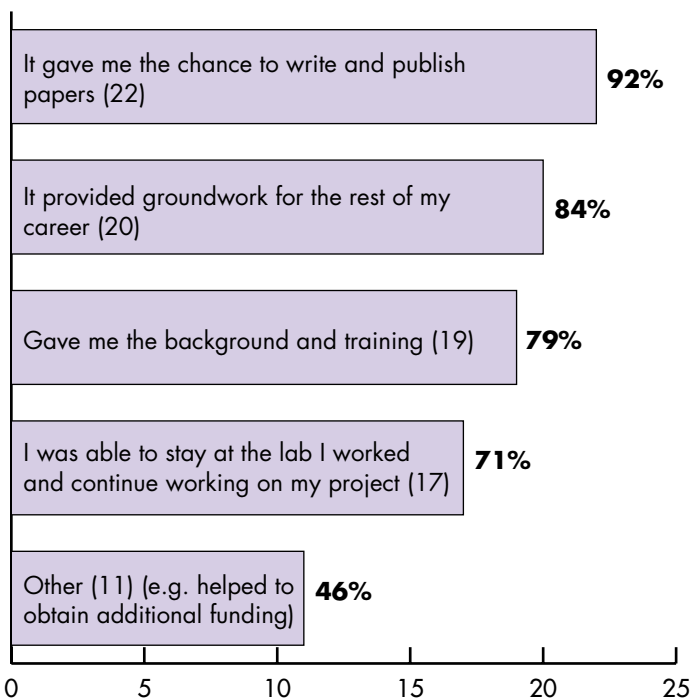
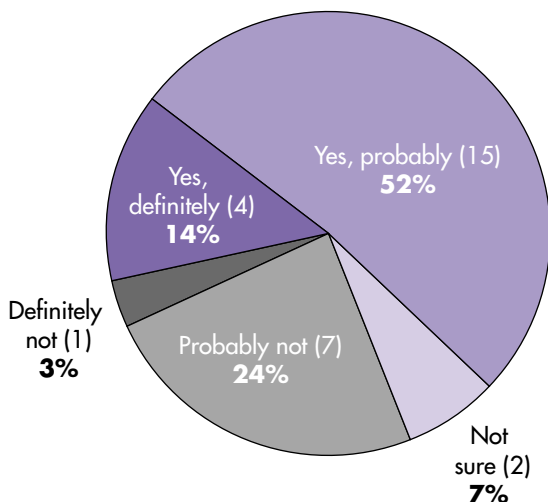


FIGURE 8

If you had not received your BCRP fellowship, do you think that you would still be involved in breast cancer work now?

N=29



Career Gains

As a career development award, the postdoctoral fellowship is meant to provide scholars with career gains.

Thus, we asked respondents about

potential career gains that they received from their BCRP funded postdoctoral training.

Almost all of the respondents felt they gained significant career gains from the BCRP funded postdoctoral fellowship. Almost half (46%) of the respondents stated that the BCRP fellowship award helped them to gain a faculty position (or equivalent) in research. Other career gains mentioned by respondents include managerial experience, legitimacy in the breast cancer research field, and the freedom to pursue their own research interests and hypotheses. See figure 9 below for more information about career gains identified by respondents.

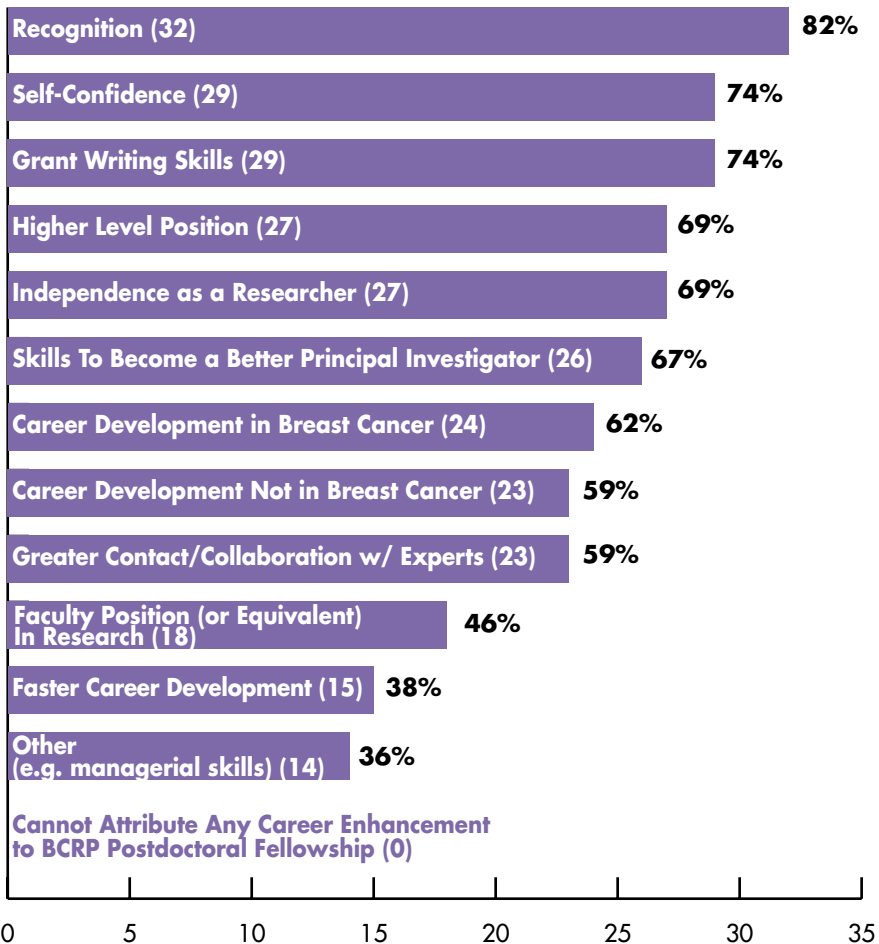
"The BCRP fellowship was a real career boost and gave me confidence to stay in the field."

Approximately half of the respondents felt that the BCRP postdoctoral fellowship award helped them to gain a faculty position (or equivalent) in research.

FIGURE 9

Career Gains Identified by Respondents

N=39



IV. Outcomes from the Research Conducted with BCRP Funds

Standard indicators of scientific productivity include quantity and quality of publications produced from the research, citations of the work in peer-reviewed journals, patents that result from the research, and awards won. For the purposes of this study, we collected the number of publications, presentations and patents that resulted, at least in part, from the BCRP-funded research. The respondents reported a total of 108 publications, 78⁵ presentations, and four patents that were at least partially funded by the BCRP fellowship. See table 2 for more information about publications resulting from BCRP funded postdoctoral research. Additionally, we were also interested in whether or not any respondents won awards or honors for the research they did as BCRP postdoctoral scholars. We found that seven of the respondents won a total of nine awards. Additionally, three of these respondents were awarded a BCRP Cornelius J. Hopper Scientific Achievement Award.

TABLE 2

Publications Resulting from BCRP Postdoctoral Fellows Surveyed

# of Publications at Least Partially Supported by BCRP Fellowship Award	Range per Respondent	Average per Respondent	% of Respondents Who Have Published at Least 1 Paper
108	0-10	2.8	82%

Obtaining Additional Funds for Breast Cancer Research

The BCRP postdoctoral fellowship awards are meant to help new investigators begin independent careers in breast cancer research. For many of our respondents, the BCRP fellowship was the first grant they served as the principal investigator. One essential aspect of an independent career is the ability to obtain on-going funding. BCRP is particularly interested in whether or not our grantees were able to obtain additional funds for breast cancer research as a result of the research they conducted with BCRP funds. Has BCRP helped grantees to obtain additional funds for breast cancer research?

In order to answer this question, we asked each respondent if they have received funding for subsequent grants based on their BCRP funded research. Realizing that some of our postdocs are not

AWARDS OR HONORS GIVEN TO RESPONDENTS FOR BCRP-FUNDED RESEARCH

Hot Paper designated by *The Scientist*

Runner-up: Biggest Break-through of 1996 designated by the journal *Science*

American Association for Cancer Research (AACR) Young Investigator Award (3)

American Family Life Assurance Company (AFLAC) Young Investigator Award

USC/Norris Cancer Center Best Postdoctoral Researcher Prize

Lawrence Berkeley National Laboratory Outstanding Achievement Award

⁵ This represents a conservative number because several of the respondents did not have complete information about the talks they have given over the years.

yet in a position to be principal investigators on grants, we also asked if the research they did with BCRP funds helped their mentor or other colleagues to obtain additional funding for breast cancer research. We found that BCRP-funded research has helped 31 of the 39 (80%) postdocs and/or their colleagues⁶ obtain additional funds for breast cancer research. In all, postdoctoral fellowship awardees reported that 51 grants totaling over \$36 million⁷ were obtained as a result of the work performed during the BCRP-funded fellowship. Furthermore, 19 of the 39 (49%) respondents have obtained over \$8 million for breast cancer research where they are the primary recipient or principal investigator (see table 3).

One way of considering whether or not BCRP has made an worthwhile investment in the postdoctoral fellowship program is to consider the amount of funds obtained by postdocs and/or their colleagues and divide it by the amount of money BCRP invested in the postdoctoral awards during the first four cycles. When we do this, we learn that:

- For every \$1 BCRP invested in postdocs during Cycles I-IV, respondents and their colleagues have obtained over \$12 for breast cancer research from various funders.
- For every \$1 BCRP invested in postdocs during Cycles I-IV, respondents have obtained almost \$2 in additional funds for breast cancer research from other funders besides BCRP.
- For every \$1 BCRP invested in postdocs during Cycles I-IV, respondents have obtained almost \$1 in additional funding for breast cancer research from BCRP.
- For every \$1 BCRP invested in postdocs during Cycles I-IV, respondents' mentors/colleagues have obtained more than \$9.50 in additional funds.

TABLE 3 Subsequent Funds Obtained as a Result of the Work Performed During the BCRP-Funded Postdoctoral Fellowship

	TOTAL IN FUNDS	TOTAL IN NUMBERS
OVERALL	\$36,117,818	31 people/51 grants
Postdoc PI:		
BCRP FUNDING	\$2,804,452	8 people/11 grants
OTHER FUNDERS	\$5,381,906	15 people/23 grants
Mentor/Colleagues:		
BCRP FUNDING	\$1,344,836	4 people/4 grants
OTHER FUNDERS	\$26,586,624	12 people/16 grants

V. Feedback about BCRP from Respondents

The survey asked respondents to provide feedback about BCRP and we specifically sought their suggestions for improving our postdoctoral fellowship award program.

The first two questions in this final section asked whether or not respondents had

⁶ In most cases, BCRP evaluation staff contacted these colleagues to confirm and/or complete information given to us by the respondents.

⁷ All dollar amounts in this section refer to direct funds only.

"I am impressed with the level of support given by BCRP during the grant writing process as well as during the course of the fellowship. Continue to offer this type of support."

recommended BCRP to their colleagues and whether or not they chose BCRP funding over another opportunity. Of the 39 respondents, 37 had recommended the program to their colleagues. The two respondents who had not recommended the BCRP postdoctoral fellowship had not had

the opportunity to do so because one was no longer working with scientists living in California and the other worked in a field in which postdoctoral appointments are rare. Six of the respondents were offered other fellowship opportunities the same year they received the BCRP award. There were several reasons why respondents chose BCRP over other opportunities including:

Amount of money: BCRP offered more money for the award and/or for travel to meetings (5);

Timing: BCRP offered the fellowship first (2);

Reputation: BCRP had a better reputation and funded more interesting research than the other funder (2); and

Breast cancer specific: BCRP was a breast cancer specific funder and the postdoc wanted to establish herself in breast cancer research (1).

Suggestions for Improvement

Overall, respondents were very satisfied with the BCRP's postdoctoral fellowship program and felt that the experience had greatly contributed to their career development. Only one respondent reported being generally unsatisfied with the program. While we heard very positive comments about BCRP's program, the respondents were forthcoming about how BCRP could improve our funding efforts. Most of the suggestions or comments listed below were mentioned only once or twice during the interviews. Respondents suggested the following ways to improve BCRP:

TRAINING

- Offer a grant-writing workshop (at the Symposium) for postdocs and new investigators.
- Sponsor a training in breast cancer pathology for those new to the field or conducting research in other breast cancer research areas.
- Collaborate with another funder (such as the Department of Defense Breast Cancer Research Program) to have postdocs sit in on grant review panels. One respondent had the opportunity to be a reviewer and said that this experience has helped him tremendously.

UNIQUE BCRP ATTRIBUTES IDENTIFIED BY RESPONDENTS

Support of the staff, especially the research administrators (RAs);

Contact postdocs had (specifically at the Symposium) with breast cancer advocates;

Innovativeness of the grants BCRP funds;

Amount of money BCRP offers; and

Quality of feedback postdocs received from the grant review process from the BCRP staff.

APPLICATION/ REVIEW PROCESS/ FUNDING

- Extend postdoc grants to three or more years. As one respondent explained, “It took me the first year to figure out what a postdoctoral fellowship was even supposed to be!”
- BCRP should adjust review criteria to make sure that people who get awards are truly interested in building a career in breast cancer research.
- Focus efforts on getting funding to recipients as close to July 1 as possible. A few grantees noted that it took more than three months for their funding to reach them.⁸
- BCRP should communicate more clearly about how postdocs can spend money on supplies and travel.
- If a principal investigator moves out of state during the award period, but is still overseeing research in California, the principal investigator should be able to continue receiving the funding. (BCRP can only fund California researchers).

NEW AREAS/FOCUS

- Create a new award type especially for MD/PhDs.
- Give supplemental awards to postdocs working with community groups for costs associated with collaboration. Respondent suggested at least \$5000 per community group per year.
- Identify strategies to encourage and fund researchers who are talented, committed to breast cancer research and have good ideas but who have not taken a traditional research path. These include researchers—mostly women—who would like to continue research in a part-time capacity in order to raise a family or for other personal reasons and researchers who have taken soft-money positions for a number of reasons. This is a group that appears to have a high attrition rate that has less to do with the quality of their ideas or interest in breast cancer than it has to do with institutional factors such as lack of support and opportunity for individuals in these positions.
- Emphasize the postdoc awards more in the BCRP portfolio. Give more money for the awards and award more of them.
- BCRP should be larger and fund more research.

COLLABORATION AND OUTREACH

- Get the word out about BCRP. Promote BCRP’s postdoctoral fellowships more. Advertise more in the biotech industry. Get the word out in the basic science community. Advertise at the AACR meeting.
- Encourage more interactions between basic scientists and clinical scientists. Help establish collaborations early. Postdocs could have a clinical mentor and a basic science mentor.

⁸ BCRP staff have made considerable effort to shorten the time between when the grantee is notified of the award and when their institution has received the funds.

CONCERNS RAISED BY RESPONDENTS

- One respondent felt that the role of the mentor is unclear. BCRP should either minimize the required involvement of the mentor or require more formal collaboration between the mentor and the postdoc.
- Another respondent felt that BCRP is still funding relatively safe grants. BCRP should not fund anything that could get funded by the NIH.
- A respondent felt that BCRP is no longer focused on early detection and this is disappointing. Even a small amount of money in this area can bring researchers into breast cancer.
- One respondent has been unable to receive a subsequent BCRP award with the same line of research that he was funded for as a postdoc. The work is now at a higher level and he doesn't understand why it was fundable as a postdoc but is not now.

FEEDBACK ABOUT THE BIENNIAL BCRP SYMPOSIUM

- The symposium provided a good opportunity for basic scientists to talk with and hear from breast cancer advocates. Scientists need to get out into the public.
- Enjoyed interaction with activists groups [at the Symposium], got a better sense of the impact and importance of translational work.
- The grant-writing workshop at the Symposium is helpful.
- The symposium was not that helpful. It was more geared toward the public and should have more of a scientific focus.

CONCLUSIONS

Has BCRP encouraged high quality researchers from a wide variety of disciplines?

The quality of the postdoctoral scholars funded by BCRP during the first four years of the program can be assessed in part by publications and patents produced by the research and by the additional funds for breast cancer research obtained by the scholars (see conclusions below for data on these indicators). Data gathered from this study indicate that BCRP did indeed fund a group of high quality, talented researchers during the first four years of the program. When examining the variety of disciplines represented by this group of postdoctoral scholars, we found that BCRP funded at least one grant in each of the priority areas during the first four funding cycles; however, the portfolio lacks balance. The majority of the awards have gone to scholars focusing their research in pathogenesis. The BCRP staff and Council are aware of this imbalance and have taken steps to address it. Evaluation of the postdoctoral program in another four to five years will help determine whether their efforts have been successful.

Has BCRP helped to develop the careers of the postdoctoral scholars?

Three areas of the survey addressed this question. First, career gains identified by respondents indicate that more than half felt that the BCRP fellowship helped them to gain recognition, self-confidence, a higher level position and skills to become a better principal investigator among others. Also, about half of the respondents said the fellowship helped them secure a faculty position (or equivalent) in research. Publications, presentations, patents and awards resulting from the BCRP funded research also helped develop the careers of the recipients. Over 80% have published at least one paper from their BCRP funded postdoctoral research and as a group they have published over 108 articles in peer-reviewed journals. Finally, almost half of the respondents have been able to obtain additional funding for breast cancer research based on the work they did with their BCRP funds. These data indicate that BCRP funding has enhanced several success parameters associated with career development.

Has BCRP recruited new researchers into breast cancer research?

Data from this study show that BCRP has recruited new researchers into breast cancer. Forty-four percent of the respondents used the BCRP postdoctoral fellowship to gain first time experience in breast cancer research. Of these, over 70% have stayed in the field. Additionally, 27% said they would not be involved in breast cancer research today without the BCRP support. These results suggest that a significant proportion of BCRP postdoctoral scholars utilized the BCRP postdoctoral fellowship to move into and then stay in breast cancer research.

Has BCRP helped to retain breast cancer researchers?

About half of the respondents were already doing breast cancer related research when they applied for the postdoctoral fellowship. This suggests that BCRP has funded a significant amount of researchers already committed to breast cancer research. Furthermore, 67% of the respondents are still involved in breast cancer research. Importantly, 62% said that the fellowship helped them to stay in the field by giving them the chance to write and publish papers, provided groundwork for the rest of their career, giving them background and training, and helping them to continue working on a project they had already begun.

Has BCRP helped to fund promising new avenues of breast cancer research that have continued?

The indicators that most answer this question include how much respondents were able to publish and present their work and whether or not additional funds were obtained based on the work funded by BCRP. As was stated above, over 80% of respondents published at least one paper based on the work they did with the BCRP funds and over 108 papers were published in total. Additionally, respondents revealed that they gave more than 78 presentations based on the research they conducted with BCRP funds, thus, sharing their progress with colleagues. When examining funding obtained based on findings from the postdoctoral fellow's work, we found that 51 grants totaling over \$36 million dollars continued, at least partially, the avenues of research begun with the BCRP funding. These figures indicate that BCRP's investment in this small group of postdoctoral scholars has helped to begin and/or continue promising avenues of research.

RECOMMENDATIONS

BCRP should continue to offer postdoctoral fellows:

- Generous feedback from the review process
- Personal interaction between postdoctoral fellowship applicants/awardees and research administrators
- Opportunities to interact with advocates (at the Symposium)
- Financial support for travel to meetings

BCRP should:

Focus outreach in areas that are under-represented in the postdoctoral fellowship portfolio

BCRP staff regularly attend and staff booths at scientific meetings as a way to promote BCRP. Additionally, research administrators employ various outreach strategies to get the word out about BCRP funding opportunities. However, data from this study indicate that outreach efforts may need to be targeted in order to diversify the portfolio.

Investigate the costs and benefits associated with increasing the amount of money awarded and length of grant for postdoctoral fellowships

Since 1995, BCRP has raised the total postdoctoral award amount from \$70,000 in the first five funding cycles to \$80,000 in funding cycles VI-VIII. For cycle IX, BCRP should consider raising the amount of money available to postdoctoral scholars as well as changing the length of the award from two years to three. Additional research will be conducted to identify the costs and benefits for both the BCRP and postdoctoral scholars associated with raising the amount and length of the award.

Consider different award types that might complement postdoctoral awards

Consider creating a supplemental award for postdocs working collaboratively with communities. One respondent suggested giving at least \$5000 per community group, per year.

Investigate creating a MD/PhD award.

Provide training for postdoctoral fellows

Offer specific grant writing/grant application workshop for postdocs (at Symposium).

Work with postdocs to obtain additional BCRP funding, especially new investigator awards.

Consider working with a breast cancer funder in another state to offer postdoctoral fellows the opportunity to sit in on grant review panels.

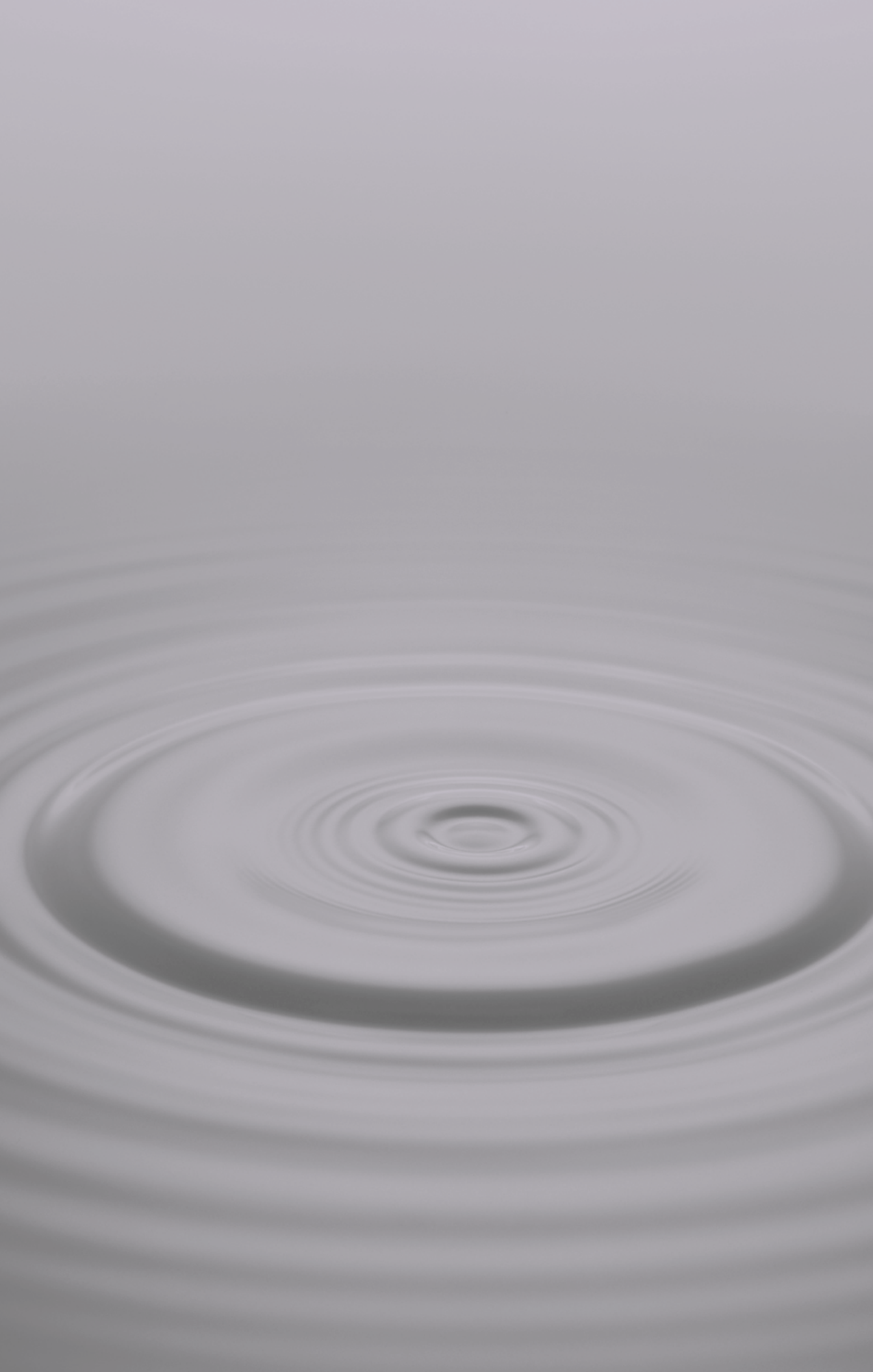
Conduct an evaluation of the postdoctoral fellowship award program approximately every 4-5 years

An evaluation of the postdoctoral program every 4-5 years would allow BCRP the opportunity to monitor the impact of the program more closely. In 4-5 years time, BCRP funds enough postdoctoral scholars to survey and there is enough time to assess whether or not scholars have been able to gain career development from their BCRP-funded postdoc. Additionally, BCRP would also have the opportunity to assess whether changes made to the program and recommendations adopted have been successful.

FURTHER RESEARCH

Scientists on non-traditional research paths

Even though BCRP funds grants to people on non-traditional research paths—e.g. part-time and those with non-faculty appointments—we heard that these type of researchers face institutional challenges that can prevent them from continuing in breast cancer. BCRP should examine special challenges facing high-quality researchers, who are committed to breast cancer and have good ideas but who are not on a traditional research path.



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