Author’s response to reviews

Title: Mentored training and its association with dissemination and implementation research output: a quasi-experimental evaluation

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Responses are also included as a Word document table with the revised Personal Cover Letter:

Reviewer 1:

1. I am a little confused about Table 3, models 3 and 4. The CIs for Fellow ORs are 1.0-10.2 and 1.0-11.0 and they are indicated as NS (by not being bolded). Are these being rounded up to 1 and hence they are NS? Or are you rounding down to 1 and they should be bolded and indicated as statistically significant? I suggest providing a little more explanation and/or provide additional decimals. The written description of the findings in the abstract and main paper does not indicate explicitly that Fellow is NS when controlling for previous grant funding. If it is indeed NS, it might avoid some potential confusion if that is explicitly stated in the text somewhere.

RESPONSE: In order to fit multiple models within the table we did in fact round to the nearest decimal and therefore, CIs cross 1.0 and are not significant. To clarify this, we have now added 2 decimal places in cases where the lower bound was rounded to 1.0, both in the tables and in the text. Page 2 line 42; page 9 lines 194-196; page 19 table 3, page 20 table 4

2. Does awarding of grant funding include co-I status or just PI? Would there be any usefulness in looking at 'PI' on grants separately if you combined them thus far? I am assuming that the implicit or explicit focus of the training program is to assist people with getting funded as PI. For example, I assume that the concept papers were all/mostly about
projects the fellows would lead? Either way, it might help the paper to have this be more explicit in the description of the program.

RESPONSE: We added a sentence to clarify that we included records with either co-I or PI status. We agree that looking at PI status would be useful, though our number is low and combining made the most sense. If we were to replicate this study in several years, we may well have enough PI status grants to examine separately. We wanted to capture any funding so that we capture the potential for capacity to be built through sharing expertise. Page 7 lines 148-149

3. Did any candidate-specific or scientific environmental issues/qualifications factor into the selection of fellows? If so, please describe and indicate any potential limitations to your findings as a result.

RESPONSE: Besides the quality of the application, several other criteria were considered. We’ve added these additional areas and have also added a sentence in limitations which underscores how these selection criteria are an example of the limitation of using nonfellows as a comparison group. Page 5 lines 110-113; page 11 lines 249-250

4. If there is room, I think it would be helpful to hear more from the authors about how we might learn more about the potential or actual impacts of specific program characteristics like dose of training/mentoring, types of activities/exercises (like your great focus on networking and collaborative writing), etc. For example, how helpful and feasible would it be to include in future evaluations of programs like this detailed surveying and monitoring of trainees, social network analyses, and/or qualitative explorations?

RESPONSE: We have added a sentence to the discussion section to highlight how understanding impacts based on specific program characteristics is likely understood through combined evaluation approaches. Page 10 lines 222-225

Reviewer 2:

1. The determinants of research outputs and impact are not extensively defined in the paper, and cannot be solely attributed to training and mentoring. Authors need to define the research questions more specifically, and collect and analyse their dataset to prove or disprove their null hypothesis.

For instance, what are the measure of success to determine scientific productivity, good research outputs and impact? The comparative analysis of grant funding, the number of publications and citations between fellows and non-fellows should be analysed, taking into consideration current research trends, areas of interest in cancer research, and the impact factors of journals that articles are published in.

RESPONSE: Our main research question was whether there was a difference in research outputs among applicants who were and were not accepted into the mentoring program. The null would be that they were the same. We have added sentence to clarify our research question. Page 5 lines 98-100
While our analyses suggest rejecting the null, we give several caveats within the limitations section. It is out of the scope of this short report to adequately address the convergence of research trends, and we now include this note in the limitations. While limited in some ways due to the overall small number of applicants, we did look at cancer area as a potential confounder in adjusted analyses (table 3 and 4). We agree that future studies, combining larger samples could address areas of interest or trends. Page 11 lines 249-250
Your point about journal impact factor is a good one. Our analyses were centered on publicly available (and easily accessed) data that other training programs could replicate. Currently, impact factor is not an available metric for download with Scopus citations data. We also feel that, with D&I spanning a wide range of journals, impact factor may be somewhat less reliable as a source of impact. As a still emerging field, new journals specifically focusing on D&I concepts continue to populate the literature with limitations to understanding their impact yet (e.g. Implementation Science Communications, the new companion to Implementation Science was just announced this year). In addition, even if we added impact factors to our analyses, our sample size would be too small for meaningful subgroup analyses. We have added this as a limitation. Page 11 lines 250-252

2. A fundamental question unanswered in this manuscript is what are the common competency gaps which hinder scientific productivity and how have identified gaps been addressed through different types of training interventions?

RESPONSE: We have added a sentence in the background section to clarify the gaps that D&I training seeks to close. All trainings discussed seek to fill the overall gap between scientific discovery and practice. The science behind doing this (e.g., methods, design, analyses) is what makes up competency in the field. There is also a specific set of D&I competencies developed by our team that have been reported on previously (Padek et al. Implementation Science 2015;10:114). Because collecting competency data requires original data collection, we cannot compare competency gaps and gains between fellows and nonfellows given we did not collect new data from nonfellows. Page 4 lines 70-71

3. The relation between mentored training and building capacity in D&I research has long been established. No new knowledge is offered in this manuscript to demonstrate advancement in understanding or application to close the gap between effective training interventions and scientific productivity.

RESPONSE: While we agree that mentored training and building capacity in research has been established, that capacity for D&I through mentored training has more recently been gaining ground. We are one of the first mentored training programs for D&I researchers (Chambers Transl Behav Med, 2016; 7:3) and the first one devoted to cancer prevention and control.
We believe that our manuscript offers one replicable template for training programs to assess trainees’ research productivity. Multiple methods are needed to fully understand growth in capacity. We have added two sentences to clarify how this template along with additional methods are needed to fully capture and understand capacity. Page 10 lines 222-225