### Vice President’s Clinical and Translational (VPCAT) Research Scholars Program

--- Summary Statement ---

2021 VPCAT Cohort

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<th>Applicant Name:</th>
<th>Heydieh Baradaran, MD</th>
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<td>Project Title:</td>
<td>Imaging Assessment of Vascular Aging and Vulnerable Plaque</td>
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#### CRITIQUE 1

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#### 1. Career Plan

**Strengths**
- She has a clearly defined career vision.
- She will be completing her MSCI during the VPCAT period, funded through a society grant so is ahead of the curve (Goal 1).
- I think there is a high likelihood that Dr. Baradaran’s career plan will contribute to her success in submitting extramural grant applications as a PI and becoming an independent researcher (she already has 2 society grants as a PI).
- Has multiple grant applications planned for 2021, including foundation grant (cost-effectiveness study through ASNR), local seed grants (not specified the subject), and an R01 using the Framingham study to look at how carotid markers correlate with incident dementia. This correlates with Goal 2 which is to improve her grant writing skills, which she plans to gain via appropriate UUH and society coursework.

**Weaknesses**
- Her research niche is a little narrow.
- Her third career goal is to complete 3 projects in the next two years that will serve as preliminary data for her R01, however she plans on submitting this R01 in Feb or June 2021, so without enough time to complete them, and it’s not clear to me that the data generated is related to her R01.
- Along these lines, while recognizing that her current mentors have encouraged her in this direction, my only concern is that she is planning to submit an R01 this spring which seems too soon and under-developed. Specifically, her R01 doesn’t build on her VPCAT proposal b/c her VPCAT proposal is about validating a new MRI sequence while the R01 proposal is to analyze a subgroup of Framingham patients who will not have received imaging via that sequence. So, it’s not clear to me that VPCAT will help her in her R01 proposal. Also, I am concerned that her R01 is not prospective and sounds by the brief description like a project more worthy of a training grant (K type). (major)
- No scientific content training planned, such as cognition, dementia, or clinical stroke (minor)
### 2. Scientific Mentoring Plan

#### Strengths
- Dr. Dennis Parker is an experienced and fantastic mentor. Though a basic scientist, he is well-aligned with Dr. Baradaran’s area of research. Additionally, Dr. Parker is already co-mentoring Adam de Havenon on his K23 so is familiar with mentoring clinicians.
- Dr. Baradaran is already working with Dr. P, with several papers together
- Appropriate meeting frequencies of 2x/mo dedicated with her mentor on top of weekly lab meetings
- Appropriate publication plan

#### Weaknesses
- No plans for monitoring / evaluating of progress (minor)
- She is missing someone in cognitive neuroscience / neurology to better shape her ideas (could be an advisor, mentor, or collaborator). As a neuroradiologist with an MRI physicist mentor, she has a big hole in this area. (major)
- As best as I can tell, she’s not done prospective patient recruitment before and doesn’t list as a mentor or collaborator anyone who has. This is another gap in her mentor plan. (minor)

### 3. Research Plan

#### Strengths
- Cognitive impairment is a hot topic right now, one that is a public health priority and readily fundable, particularly if one can find angles that suggest treatment paradigm changes
- It is feasible in 2 years to recruit such patients (though she doesn’t actually discuss feasibility, her group has successfully recruited in this area before)
- Builds logically on her prior work
- Dr. Baradaran clearly has sufficient research experience to conduct her plans and the plan is appropriate for her stage of research development (major)

#### Weaknesses
- The overall connection between cognitive impairment and carotid atherosclerosis is not convincingly made, nor do I think it can be convincingly made with her proposal
- I have some concerns about the research plan itself:
  - All SA: The number of measures she plans to assess on 30 patients exceeds what is generally considered statistically valid
  - SA 2: what vessels are vulnerable plaque and compliance being measured? Is this on carotid u/s or the new c-vwMRI?
  - SA 2 and 3: I understand that the c-vwMRI can image vessels not accessible to carotid ultrasound. Though Dr. B lists that as a benefit to the MRI-based sequences, I don’t see discussion of how that will be used in the study: there are many neck/brain vessels. Which ones will Dr. B measure the compliance? How will they correlate with findings of brain aging when those findings are dispersed?
  - SA 3: The lack of controls is concerning. I would think that she’d want to include controls matched for HTN, DM, age, sex, etc., in order to know if the markers of carotid atherosclerosis are more likely causative with brain aging markers vs just both being downstream effects of classic vascular risk factors.
- Though she states the c-vwMRI can be added onto a “standard vwMRI acquisition”, vwMRI is not standard (e.g. I cannot order one through IHC), but rather is unique to select academic institutions.
### 4. Institutional Support

**Strengths**
- Excellent
- Currently funded 50% effort through a society grant, which ends June 2021. At that point her department guarantees her 40% protected time.
- Her Chair and Division Chief are very specifically investing in her

**Weaknesses**
- None

### 5. Applicant’s Overall Potential

**Strengths**
- Fantastic publication record (39 peer-reviewed publications, 13 as first author), and in subjects highly aligned with her career goals. As a co-author on 2 of them, I am personally aware of her ability to take constructive feedback and her perseverance with papers.
- Already with society funding (Scholar Award in Neuroradiology from the Foundation of the American Society of Neuroradiology) and since coming to the U, a General Electric Radiology Research Academic Fellowship (GERRAF). Papers coming out based on the two.
- Overall fantastic applicant who is clearly dedicated to a research career
- She clearly has the potential to develop into an independent and productive researcher within their field
- Dr. Baradaran is in the perfect position in her career to get the most out of the 2-years in the VPCAT Program

**Weaknesses**
- None

### Reviewer Comments

Well-written application. The U is lucky to have you! I am concerned that the VPCAT research proposal is under-powered and under-developed and, ultimately, that it doesn’t lead you to the R01 you’re proposing. Nonetheless, I think you’re moving in the right direction and are doing great work.

### CRITIQUE 2

1. Career Plan: 2
2. Scientific Mentoring Plan: 1
3. Research Plan: 1
4. Institutional Support: 1
5. Applicant’s Overall Potential: 2

### 1. Career Plan

**Strengths**
- The career plan is clearly defined and includes specific goals and coursework that will support Dr. Baradaran’s continued progression and development.
Dr. Baradaran will attend the RSNA Advanced Grant Writing course, which will augment other grant writing training offered institutionally.

**Weaknesses**
- Goal 3 would be strengthened by additional details on how Dr. Baradaran will learn to lead specific research projects.

### 2. Scientific Mentoring Plan

**Strengths**
- The primary mentor, Dr. Parker, has substantial expertise in Radiology and Imaging Sciences, and has mentored other VPCAT Scholars. Therefore, the scientific mentor is very well qualified for the proposed research.
- The applicant will meet regularly with Dr. Parker and attend his lab meeting's, which will provide valuable opportunities for continued learning, training, and advancement.
- Dr. Baradaran has been working with Dr. Parker since 2018.

**Weaknesses**
- There are no significant weaknesses.

### 3. Research Plan

**Strengths**
- The research plan builds on innovative imaging techniques that the applicant and their team have developed, including the ability to measure vulnerable plaque. Therefore, the research is innovative and addresses an area of high public health significance.
- The proposed research builds logically on the applicant’s prior work, training, and expertise.
- The proposed research is hypothesis driven and feasible.
- The proposed research is likely to support extramural grant applications.

**Weaknesses**
- There are no significant weaknesses.

### 4. Institutional Support

**Strengths**
- There is very strong institutional support.

**Weaknesses**
- There are no significant weaknesses.

### 5. Applicant’s Overall Potential

**Strengths**
- This is an excellent application from a highly productive physician scientist with a clear career development plan, well-qualified mentors, a significant research plan, and very strong institutional support.
Weaknesses

- There is just a very minor weakness in one goal in their career development plan, as noted above.

Reviewer Comments

CRITIQUE 3

1. Career Plan: 5
2. Scientific Mentoring Plan: 3
3. Research Plan: 2
4. Institutional Support: 4
5. Applicant’s Overall Potential: 3

1. Career Plan

Strengths

- Dr. Baradaran’s proposal has a clearly defined vision and research niche involving establishing extramurally funded research program centered on imaging carotid atherosclerosis and evaluating its relationship to downstream effects, including cerebrovascular ischemia, cognitive dysfunction, and dementia.

- Career goals and objectives including MSCI courses are appropriate in the context of Dr. Baradaran’s prior experience and have a high likelihood of success in contributing to research independence.

Weaknesses

- There is not a clear relationship between the career development plan and the proposed research. For example, Dr. Baradaran has proposed to take coursework involving Systematic Reviews, Regression and Cost-Effectiveness, however it is unclear how those domains relate to the proposed specific aims.

- Although Dr. Baradaran has a clearly defined transition to independence plan, she will be increasing her clinical time and decreasing her academic time starting July 21. If Dr. Baradaran requires additional career development, this would be a weakness to decrease her protected academic time.

- There are no detailed plans to evaluate career development progress.

2. Scientific Mentoring Plan

Strengths

- Scientific mentor, Dr. Parker is uniquely qualified to support Dr. Baradaran in the proposed research.

- Drs. Parker details his role in Dr. Baradaran research proposal and his contributions to the proposed work.

- Dr. Baradaran has received extramural and institutional support.

- Dr. Minoshima details current 50% FTE, decreasing to 40% in July 2021.

Weaknesses

- Drs. Parker and Baradaran only have one published abstract together and with only one manuscript currently in submission.

- There are no detailed plans to evaluate research progress.
### 3. Research Plan

**Strengths**
- Convincing significance and preliminary data by Dr. Baradaran to support proposed research
- Clearly detailed future plans for NIH R01 Funding

**Weaknesses**
- Unclear alignment of career development courses and research aim.

### 4. Institutional Support

**Strengths**
- Strong support from Mentors (Parker) and Division Chief (Minoshima)
- Clearly defined release to attend VPCAT activities.
- Financial and research support documented from institution.

**Weaknesses**
- Drop in protected academic time from 50% to 40% in July 2021 is concerning given Dr. Baradaran is proposed continued career development work.
- Unclear plan to address inadequate time provided

### 5. Applicant’s Overall Potential

**Strengths**
- Dr. Baradaran is a strong applicant with a track record of publications and existing extramural funding.
- Highly qualified mentorship team with a history of successful mentorship.
- There is a high likelihood of extramural funding in the next two years.

**Weaknesses**
- Lack of alignment of career and research aims as mentioned above.
- Decreased in protected academic time is a weakness.

### Reviewer Comments

Dr. Baradaran presents a strong application to the VPCAT program, with a strong track record of publications, and extramural funding. The mentor is excellent and has a history of successful mentorship. The application can be improved by better aligning career development and research aims. In addition, the drop in protected academic time does not indicate institutional support for continued career development.