Re: [EXTERNAL] Re: SPAN: MRI Fat Suppression and Scan time in Stage 1

From: **Arbab, Ali** | AARBAB@augusta.edu

Friday, Apr 9, 10:05 AM

To: **Ayata, Cenk, M.D.** | CAYATA@mgh.harvard.edu, **Basavaraju Ganganna** | basavaraju.ganganna@yale.edu, **Fahmeed Hyder** | fahmeed.hyder@yale.edu, **Joe Mandeville** | jbm@nmr.mgh.harvard.edu, **Bibic, Adnan** | Bibic@kennedykrieger.org, **Huang, Shuning** | Shuning.Huang@uth.tmc.edu, **Thedens, Daniel R** | dan-thedens@uiowa.edu, **Mihailovic, Jelena** | jelena.mihailovic@yale.edu, **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu

Cc: **Karisma Nagarkatti (USC)** | nagarkat@usc.edu, **Patrick Lyden (USC)** | plyden@usc.edu

At AU, we agree

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From: **Ayata** | CAYATA@mgh.harvard.edu

To: **Basavaraju Ganganna** | basavaraju.ganganna@yale.edu

Friday, Apr 9, 12:57 PM

Dear All,
Here is the bottomline that emerged from the two discussion on MRI for the animal models for stage 2.

MRI acquisition protocol for Stage 2 Pilot:

- Scan n=3 normal brains and n=3 stroked animals for each animal model for each site. You may scan the same animal before and 48 hours after stroke.
- Obtain RARE + T2 map + ADC map
- Field of view:
  - Aged and obese mice: (a) original 19.2 mm in-plane x 15 mm in slice direction, and (b) 10% larger (21.12 mm).
  - Spontaneously hypertensive rats: 25.6 mm in-plane, 0.8 mm slice thickness.
- Matrix density 128 x 128 x 30 slices in all scans.

- Use fat suppression for all scans.

This is specifically for the pilot scans. Based on the observations in the pilot, we will finalize the FoV and RARE decisions on stage 2 MRI protocols. We will decide whether we need a larger FoV, and we may drop RARE from both time points or perform RARE-only 30d scans. One way or another, scan times will be reduced.

In pilot, we will scan RARE because Fahmeed raised the possibility of eliminating T2/ADC from 30d scan and performing RARE only. This is based on the fact that 30d scan readout is only the brain volume to quantify tissue loss, and RARE can potentially achieve this. If it works, it would be a tremendous time save. There are potential problems, however, which is the reason why we will keep RARE/T2/ADC in the pilot and compare the RARE-only approach to T2/ADC approach in the pilot. In the meantime, Ryan is working to see if a a RARE-only neural net might be developed using stage 1 MRI. But we do not know whether aged/obese mouse or hypertensive rat images will perform as well in the neural net, hence the ask for n=3 animals.

It is imperative that all sites sac the mice after 48h scan and perform TTC staining based on a standardized protocol that will be distributed by the CC as part of the Stage 2 Pilot SOP. The latter is important because validation requires comparing MRI to TTC, and TTCs from different sites must be comparable.

Please REPLY ALL if you agree, or send suggestions to revise further if I made an error. Once final, this will be inserted in the Stage 2 Pilot SOP.

Thanks!
Cenk

PS: Karisma, would you please kindly plan to use this summary, and responses to it, to revise the working draft for the Stage 2 Pilot SOP?

From: **Arbab, Ali** | AARBAB@augusta.edu Tuesday, Apr 13, 10:10 AM

To: **Ayata, Cenk, M.D.** | CAYATA@mgh.harvard.edu, **Thedens, Daniel R** | dan-thedens@uiowa.edu

Cc: **Basavaraju Ganganna** | basavaraju.ganganna@yale.edu, **Fahmeed Hyder** | fahmeed.hyder@yale.edu, **Joe Mandeville** | jbm@nmr.mgh.harvard.edu, **Bibic, Adnan** | Bibic@kennedykrieger.org, **Huang, Shuning** | Shuning.Huang@uth.tmc.edu, **Mihailovic, Jelena** | jelena.mihailovic@yale.edu, **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu, **Karisma Nagarkatti (USC)** | nagarkat@usc.edu, **Patrick Lyden (USC)** | plyden@usc.edu

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The images will be uploaded soon. The same mice will undergo post-stroke MRI on Friday

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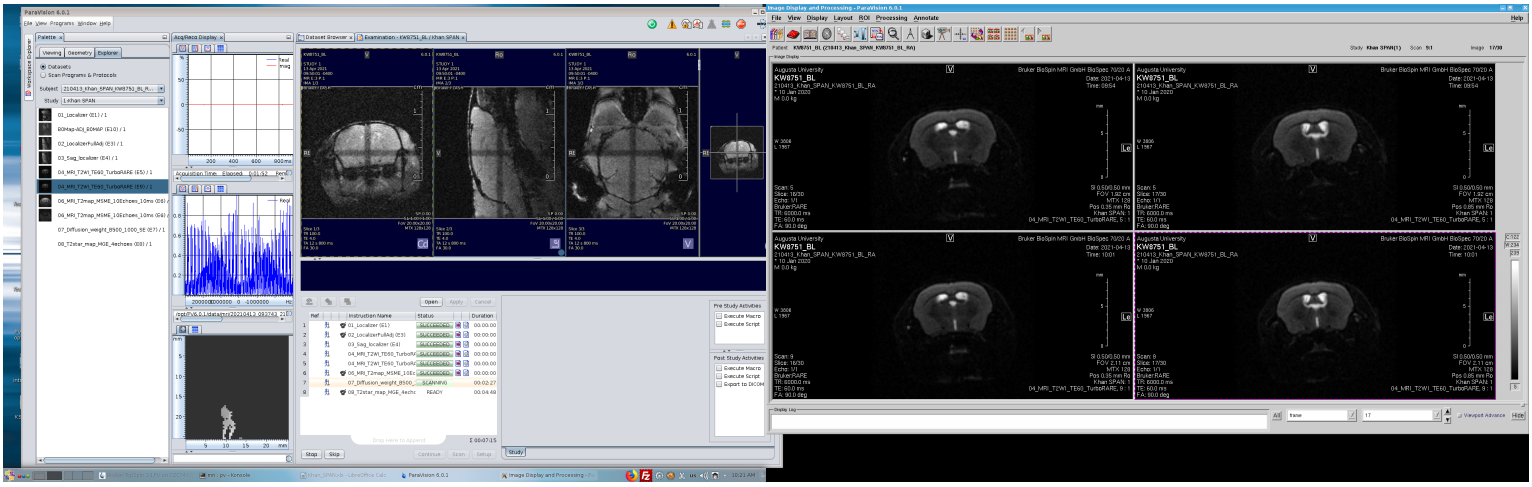
Ali S. Arbab, MD, PhD
Professor, Georgia Cancer Center
1410 Laney Walker Blvd., CN-3315

Augusta, GA. 30912
Tel: 706-721-8909



From: **Ayata** | CAYATA@mgh.harvard.edu To: **Thedens** Friday, Apr 9, 1:17 PM

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Good point. Yes, the intent to compare two FoVs essentially duplicates the scan time.

As a group we must decide whether 10% larger FoV is really essential. Correct me if I am wrong but this was out of concern for the increased fat content in obese mice. If fat suppression can eliminate this concern, or the problem can be overcome by tweaking other scan parameters, then we can drop it from the pilot, which simplifies things a lot.

On the other hand, mice will be sac'ed at the end of the scan in pilot, so post-MRI health or mortality is not a concern. But if larger FoV is not felt to be essential, then I would rather keep thing simple and efficient.

What do others think?

Cenk

> From: **Daniel R** | dan-thedens@uiowa.edu Friday, Apr 9, 1:08 PM
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> Question/clarification:
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> > From:

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dan-thedens@uiowa.edu

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From: **Adnan Bibic** | adnan.bibic@jhmi.edu — Tuesday, Apr 13, 10:25 AM

To: **Arbab, Ali** | AARBAB@augusta.edu, **Ayata, Cenk, M.D.** | CAYATA@mgh.harvard.edu, **Thedens, Daniel R** | dan-thedens@uiowa.edu

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Hi,

JH

1) localizers and RARE images are with fat suppression and T2map and ADC are without fat suppression
2) Average scan time is about 40 minutes.

Best regards
Adnan

Adnan Bibic, Ph.D.

MRI Biophysicist
Manager – Pre-Clinical MRI Facility
F. M. Kirby Research Center, Kennedy Krieger Institute
ROOM G28B, 707 N. Broadway, Baltimore MD 21205

Email 1: adnan.bibic@jhmi.edu
Tel:1-443-923-9527

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