

Re: [EXTERNAL] Re: SPAN initial rat imaging test

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

Friday, Mar 26, 9:11 AM

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

Cc: **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu, **Fahmeed Hyder** | fahmeed.hyder@yale.edu, **Huang, Shuning** | Shuning.Huang@uth.tmc.edu, **Joe Mandeville** | jbm@nmr.mgh.harvard.edu, **Adnan Bibic** | adnan.bibic@jhmi.edu, **Basavaraju Ganganna** | basavaraju.ganganna@yale.edu, **Mihailovic, Jelena** | jelena.mihailovic@yale.edu

We are routinely using hypertensive rats (older ~400-600gm) for brain imaging with the following parameters:

We are using a FOV of 26.6 and a slice thickness of 0.8mm. We have 35 slices in total.

For T2WI Turbo-rare TE/TR = 60/6100 ms

MSME T2map 15 echoes TE= 10, 20,150ms ; TR= 6000

Flair TE/TR = 22/10000ms

DTI 3D EPI TE/TR 22/800ms

High resolution 3D T1WI : Resolution is 0.150 isotropic. TE/TR = 3.5/21ms

Ali S. Arbab, MD, PhD

Professor, Georgia Cancer Center

1410 Laney Walker Blvd., CN-3315

Augusta, GA. 30912

Tel: 706-721-8909

From: Ayata, Cenk, M.D. <CAYATA@mgh.harvard.edu>

Sent: Thursday, March 25, 2021 9:17 PM

To: Thedens, Daniel R <dan-thedens@uiowa.edu>

Cc: Ryan.Cabeen@loni.usc.edu; Fahmeed Hyder <fahmeed.hyder@yale.edu>; Huang, Shuning <Shuning.Huang@uth.tmc.edu>; Joe Mandeville <jbm@nmr.mgh.harvard.edu>; Arbab, Ali <AARBAB@augusta.edu>; Adnan Bibic <adnan.bibic@jhmi.edu>; Basavaraju Ganganna <basavaraju.ganganna@yale.edu>; Mihailovic, Jelena <jelena.mihailovic@yale.edu>
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Thanks, Dan, this is very helpful. I am cc'ing the MRI group for their thoughts and comments, and it would indeed be helpful if you can share the images with all cc'ed here. Ryan and I will take a look at the uploaded images as well. I suspect this will be a core discussion at the April 2 and 6 zooms.

Regards,

Cenk

On Mar 25, 2021, at 12:53, Thedens, Daniel R <dan-thedens@uiowa.edu> wrote:

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I have uploaded a rat MRI study to the Pilot Stage 2, labelled "IR0001" (Iowa rat 0001). This is a Day 2 post-surgery.

The protocol I used was identical to the mouse protocol except that the field of view was increased to 25.6 mm (from 19.2) and the slice thickness was increased to 0.8mm (from 0.5mm). Matrix sizes were kept at 128x128 to keep the scan time the same. Voxel sizes are thus larger than in the mouse. I also added a second RARE_anatomy_192 scan that increased the matrix size to 192 x 192 in-plane and reduced averages from 4 to 3. This resulted in a very similar scan time and should have approximately the same SNR as in the mouse images.

Comments on this initial run:

- Overall image quality was good for RARE and T2 map sequences. This is not surprising given that the voxel volume is nearly 3x larger.
- The DWI scans are probably unusable in this set as there is a large amount of motion artifact. I can think of variety of causes, including vibration in the fixture, respiratory motion arising from sub-optimal positioning and restraint, or even reduced warm airflow causing the animal to shiver. I will need to investigate.
- The higher resolution RARE scan looks considerably more 'crisp' with the same duration.
- There is a decent amount of phase wrap in the images at this field of view, though it does not affect the brain. Still, in larger animals it might be excessive. I have historically done this with phase in the L/R direction, but I don't think there would be an issue swapping and it might alleviate the problem.
- It may be desirable to increase the matrix on the T2 and DWI, but since these are run at 1 average, this is very likely to require additional time unless we do anisotropic resolution in-plane (say 192 x 128).

Cenk, if you want to see the images and it's more convenient, I can put these at an externally accessible link for download.

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Dan Thedens

dan-thedens@uiowa.edu

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From: **Adnan Bibic** | adnan.bibic@jhmi.edu

Wednesday, Apr 7,
2:20 PM

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 everyone,

We talked about the fat suppression yesterday.

Here is the information about the protocol we used at JH.

Localizer	fat suppression
RARE	fat suppression
T2map	no fat suppression
ADC	no fat suppression

Was RARE supposed to be without fat suppression?

Best regards

Adnan

Adnan Bibic, Ph.D.

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