RE: [External] RE: topography

From: **Patrick Lyden** | plyden@usc.edu Tuesday, Jun 8, 3:19 PM

To: **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu

Cc: **Diniz, Marcio A** | Marcio.Diniz@cshs.org, **'Andre Rogatko (Andre.Rogatko@cshs.org)'** | Andre.Rogatko@cshs.org, **Jessica Lamb** | lambj@usc.edu, **Karisma A Nagarkatti** | nagarkat@usc.edu

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What do you think?

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From: **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu Tuesday, Jun 8, 3:26 PM

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Great to hear, and exciting! I appreciate the opportunity to work on sharing these results,

For #1, I'll start making overlays of the anatomical regions like you describe. We can also make 3D surface renderings in case they are able to show more too. For #2, I think Marcio only shared the cases with 0 & 1, but not the intermediate cases. So if the full table can be shared, then I can also look at those cases with intermediate values and do those additional tests. Maybe after that we could go over to discuss and plan any remaining pieces before writing?

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Email: rcabeen@loni.usc.edu
Web: cabeen.io
www.ini.usc.edu

> From: **Marcio A** | Marcio.Diniz@cshs.org Tuesday, Jun 8, 3:49 PM
>
> Hi Ryan,
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From: **Patrick Lyden** | plyden@usc.edu Thursday, Jun 10, 1:30 PM

To: **Diniz, Marcio A** | Marcio.Diniz@cshs.org, **'Andre Rogatko (Andre.Rogatko@cshs.org)'** | Andre.Rogatko@cshs.org
Cc: **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu

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Ryan's fabulous results (see attached) confirm our theory: the "0" animals (all right turns) have striatal lesions and the "1" animals (all left turns) have mainly cortical and thalamic lesions. There is very little overlap in the frequency distributions. Ryan and I are going to start working on a paper, and I would like you involved too. I think it would be very interesting to next map the intermediate scores. Marcio, can you send Ryan a list of IDs for the animals who scored within a range of 0.5, say 0.4 to 0.6?

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To: **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu

Yes, I would like to see the plots that show each group separately as well.

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To: **Patrick Lyden** | plyden@usc.edu, **Rogatko, Andre** | Andre.Rogatko@cshs.org
Cc: **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu

Hi Patrick and Ryan,

That's look exciting! Apologies for my delay, I was taking care of randomization for stage 2 with Jessica.

I created a variable corner_index_cat that includes the following categories 0, 0.01 – 0.2, 0.21 – 0.4, 0.41 – 0.6, 0.61 – 0.8, 0.81 – 0.99 and 1. Please see corner_test_categorized.csv.

I also filtered only mice with corner test between 0.4 and 0.6 as requested. Please see corner_test_only_4_6.csv.

Let me know if you need the data in different format, Ryan.

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Thanks. What do you need to pull it off?

> From: **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu | To: **Patrick Lyden** | plyden@usc.edu | Tuesday, Jun 8, 3:26 PM
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> > Room 245

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1501 San Pablo Street
Los Angeles, CA 90089-2821
plyden@usc.edu

From: **Patrick Lyden** | plyden@usc.edu Friday, Jun 11, 5:11 PM

To: **Diniz, Marcio A** | Marcio.Diniz@cshs.org
Cc: **Rogatko, Andre** | Andre.Rogatko@cshs.org, **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu

Thanks Marcio.

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From: **Ryan Cabeen** | ryan.cabeen@loni.usc.edu Monday, Jun 14, 9:43 PM

To: **Diniz, Marcio A** | Marcio.Diniz@cshs.org

Hi Marcio,

One more thing, I just wanted to loop you in on a few tests I did for validating the MRI pipeline. Dr Ayata suggested comparing early timepoint lesion volume and late timepoint tissue volume (atrophy). Our idea was that this would be some indication of the quality of the imaging pipeline, since they should have a strong association (seems to be the case empirically). The results are attached — thought I'd share with you in case they are useful, or if you might have some additional insights.

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From: **Diniz, Marcio A** | Marcio.Diniz@cshs.org Thursday, Jun 17, 11:03 AM

To: **Ryan Cabeen** | Ryan.Cabeen@loni.usc.edu

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From: **Ryan Cabeen** | ryan.cabeen@loni.usc.edu Wednesday, Jun 23, 10:39 PM

To: **Diniz, Marcio A** | Marcio.Diniz@cshs.org

Hi Marcio,

I appreciate the guidance on testing the interaction — I'll indeed go with your recommendation of the likelihood ratio test! Also, that's right about the ipsi and contra tissue volume variables.

Agreed that it's important to transform those videos into statistical tests. I should clarify that the video showed the difference in lesion frequency (group 1 minus group 0). The colormap codes negative values as blue and positive values as red (so they are not two separate distributions that map overlap). The darkest red and blue colors correspond to a 20% difference in lesion probability. So one important note, both groups had lesions in striatum, but group 1 had 20% less of them there (and more elsewhere). I guess what's missing here is that the plot doesn't capture the variability within each group, which could be big enough to swamp the group difference.

So I was thinking a possible next step is to do voxel-based analysis, where we formalize this as a statistical test at each point in the lesion areas. I've done this in other MRI studies using this tool: github.com/ANTsX/ANTsR This could avoid the issues of hard categorization of each case as striatum vs cortex (it seems each case is a mixture of both, but at different proportions). So perhaps next, I can this a try and we can then review the results and code

together?

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