

# Specimens

## Specimens

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The Adult Changes in Thought (ACT) study is a longitudinal population-based prospective cohort study of brain aging and incident dementia in the Seattle metropolitan area. This cohort includes 5,000+ participants of which more than 700 have agreed to autopsy upon their death. From this smaller population who agreed to an autopsy, participants who had experienced at least one mild to moderate traumatic brain injury (TBI) with a loss of consciousness were chosen for this study, along with sex-, age- and post mortem interval- (PMI) matched controls. The specimens page lists this cohort sub-group in a sortable matrix, which allows for exploration of the donors by various demographic and/or pathological features.

Clicking on the column header will sort alphanumerically, clicking twice will toggle between ascending and descending order.

Donor	Age (yrs)	Sex	Educatio...	TBI?	# TBI	Age at 1...	Duration	Dementia?	DSM-IV Dx	ApoE4	CERAD ...	Braak st...	NIA Rea...
<a href="#">H14.09.025</a>	84	M	16	Y	2	23	10 min - 1 hr	Dementia	Alzheimer'...	N	0	0	0
<a href="#">H14.09.058</a>	88	M	14	N	0	0	Unknown ...	No Deme...	No Deme...	N	1	1	1
<a href="#">H14.09.028</a>	78	M	16	N	0	0	Unknown ...	No Deme...	No Deme...	N	2	3	2
<a href="#">H14.09.030</a>	90-94	F	15	N	0	0	Unknown ...	No Deme...	No Deme...	Y	3	3	2
<a href="#">H14.09.021</a>	88	M	12	Y	1	18	> 1 hr	Dementia	Alzheimer'...	N	0	1	1
<a href="#">H14.09.008</a>	90-94	M	9	N	0	0	Unknown ...	Dementia	Multiple E...	N	3	6	3
<a href="#">H14.09.001</a>	90-94	M	16	Y	2	15	> 1 hr	No Deme...	No Deme...	N	0	6	2
<a href="#">H14.09.062</a>	89	F	16	N	0	0	Unknown ...	No Deme...	No Deme...	Y	1	3	1
<a href="#">H14.09.075</a>	78	F	6	Y	1	56	3-5 min	Dementia	Alzheimer'...	N	3	6	3
<a href="#">H14.09.004</a>	90-94	M	14	N	0	0	Unknown ...	No Deme...	No Deme...	N	1	3	1

## Specimen Detail Page

Clicking on a link from the Specimens page or clicking on a circle from the t-SNE plot from one of the data snapshots will open a specimen detail page. This page allows access to the data collected from this donor including [Gene Detail](#), [Gene Set](#), [Neuropathology Metric Detail](#), [Neuropathology Metrics](#), [Donor Detail](#) and [Image Data](#).

### Gene Detail

**Symbol:** MAG

**Name:** myelin associated glycoprotein

**z-score:** PCx -0.5230 TCx -0.1490 FWM 1.4238

**Related:**

### Neuropathology Metric Detail

**Name:** SLC17A7 **Method:** ISH

**Full Name:** Solute carrier family 17 (vesicular glutamate transporter), member 7 (ISH)

**Description:** ISH of the vesicular glutamate transporter SLC17A7 (VGLUT1), targeting all excitatory cells.

**Measured:** FWM N/A HIP N/A PCx N/A TCx N/A

**z-score:** FWM N/A HIP N/A PCx N/A TCx N/A

### Donor Detail

Donor	H14.09.021	Age	88	Sex	M
TBI?	Y	# TBI	1	ApoE4	N
Braak stage	1	CERAD score	0	NIA Reagan	1
Dementia?	Dementia	DSM-IV Dx		Alzheimer's Disease Type	

### Genes from the Overview Tours

Gene Symbol	PCx	TCx	FWM
LRRC37A2			
TF			
APLN			
JUNB			
CPLX2			
TEX29			
MAG			
ST18			
SPHKAP			
SCARNA11			
SELE			
SERPINA3			
RELB			
CTNNA3			
HAPLN4			
PCSK1			
GABRQ			
LAMP5			
CLDN11			

### Neuropathology Metrics

Metric	Method	FWM	PCx	TCx
α-SNCA	Luminex			
pTau-181	Luminex			
VEGF	Luminex			
Tau	Luminex			
TNFα	Luminex			
RANTES	Luminex			
MIP-1α	Luminex			
MCP-1	Luminex			
IL-7	Luminex			
IL-6	Luminex			
IL-4	Luminex			
IL-1β	Luminex			
IL-10	Luminex			
IFNγ	Luminex			
BDNF	Luminex			
Aβ42	Luminex			
Aβ40	Luminex			
SLC6A1	ISH			
SLC17A7	ISH			

### IHC/ISH Images for Selected Metric/Structure

Name: SLC17A7  
Structure: PCx

## Gene Detail

Once a data point is selected in the [gene set](#) panel, details of that gene will populate this space including the gene symbol, the gene name, the expression value from the [RNA-Sequencing](#) data, and a link to other Allen Institute datasets that have measured this gene.

## Gene Set

The gene set panel is populated by the genes in the data snapshot (if you linked from a specific snapshot) or by the entire gene set that was used in all the snapshots (if you arrived from the Specimens page). The column headers are the samples from this donor that were sequenced. The gene set is a smaller version of the heatmap from the RNA-Sequencing data limited by the number of genes and the donor. For more information on the heatmap functionality, click [here](#). The icon in the top right-hand corner of the gene set display will link you to the RNA-Seq data for all donors and samples.

## Neuropathology Metric Detail

Once a datapoint in the [neuropathology metrics](#) display is selected, metric detail will populate this panel (and if the metrics came from an image, the image will also populate the [image data](#) panel) including the short and long names of the metric, the method used to collect the metric, a description of what the metric is and it's significance, and the values collected or calculated.

### Neuropathology Metric Detail

**Name:** pTau-181 **Method:** Luminex

**Full Name:** Phosphorylated Tau

**Description:** Tau abnormally phosphorylated at threonine 181; abnormally phosphorylated tau plays an important role in tau aggregation and the pathological process in Alzheimer's disease; neurofibrillary tangles are comprised of hyperphosphorylated tau.

**Measured (ng/mg):** FWM N/A HIP 1.16 PCx N/A TCx 1.26

**z-score:** FWM N/A HIP -0.36 PCx N/A TCx -0.28

## Neuropathology Metrics

This panel lists all the neuropathology assays collected on this donor. To populate data from this panel into the [neuropathology metric detail](#) panel, click on a data point in the heatmap.

Column	Description
	An icon in this column indicates there is a value for this metric. Clicking on the column header will sort the data by this column.
	An icon in this column indicates there is image data for this metric. Clicking on the column header will sort the data by this column.
Metric	Lists the assay that was measured/calculated. Also listed in the <a href="#">neuropathology metric detail</a> display.
Method	Lists the method that was to acquire the metric. Also listed in the <a href="#">neuropathology metric detail</a> display.

Heatmap Columns	Brain regions from which the metric was collected/calculated. This data is presented in heatmap form, and the color range can be adjusted by using the sliders on the color map below the heatmap.
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### Donor Detail

The donor detail panel is populated with metadata from this donor including Donor ID, Age, Sex, Reported TBI, #TBI, Presence of ApoE4 allele, Braak stage, CERAD score, NIA Reagan, Dementia diagnosis and DSM-IV diagnosis.

### Image Data

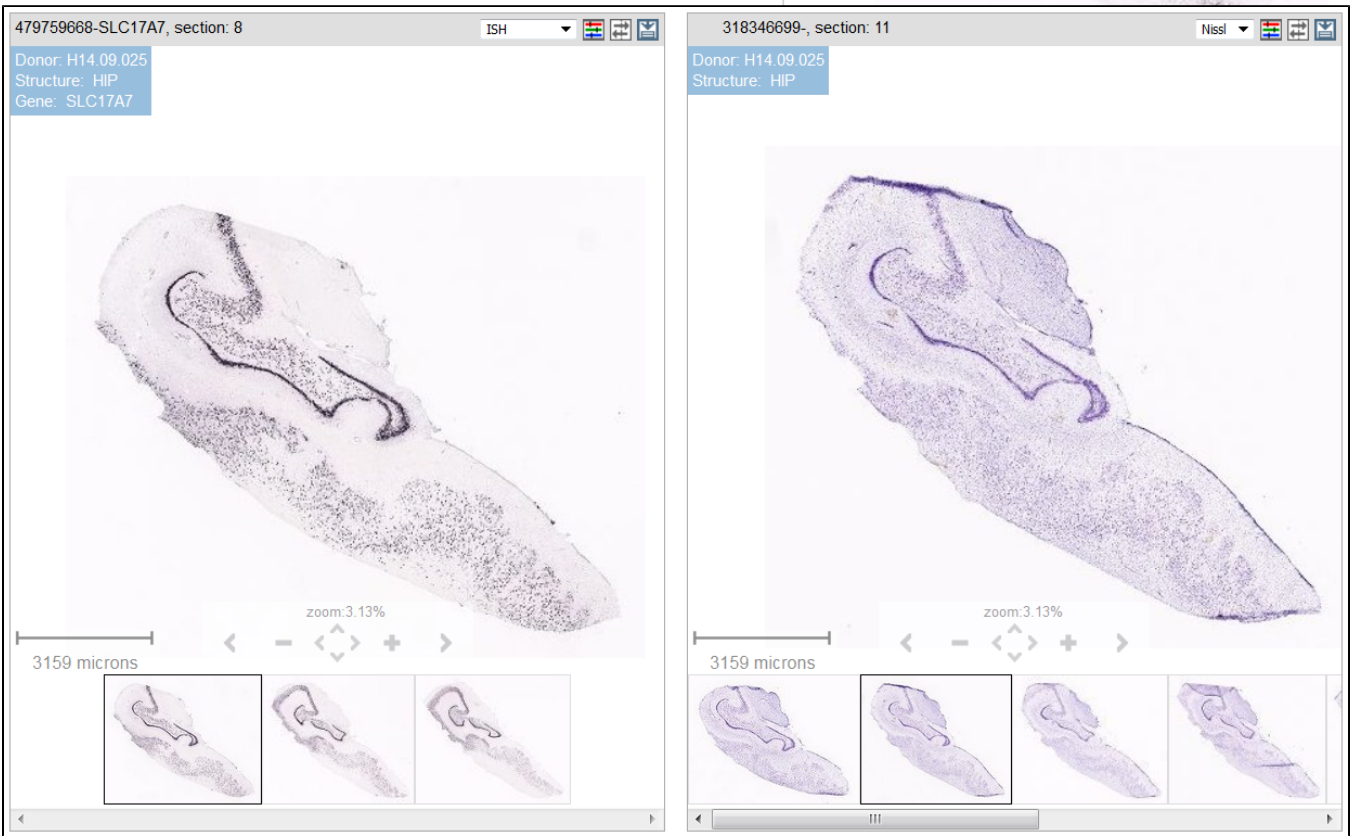
The image data panel is populated once a data point has been selected in the neuropathology metrics panel. This image viewer includes a main viewer, thumbnail views of all the images in the series - which when selected will bring up the image in the main viewer, the name of the assay and the location in the top left-hand corner of the viewer and on-screen navigation tools. Zoom in and out with the onscreen tools or use the [keyboard commands](#).

In the top right hand corner of the viewer is an icon that will take you to a [High Resolution Image Viewer](#).






### High Resolution Image Viewer

Once you click on the full screen viewer button, you will be taken to a screen with side by side viewers (when available). The left hand viewer shows the image series you launched the viewer from and the right hand viewer displays the closest reference image from the same specimen block. This viewer is very similar to the viewer on the donor page with more functionality (see the [toolbar](#) features).

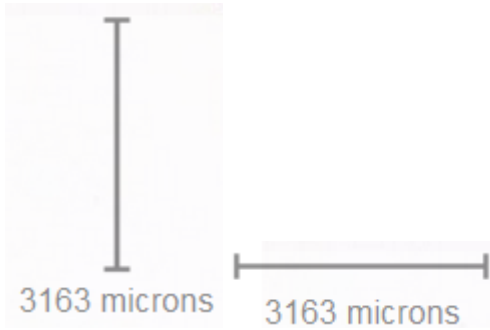


### Toolbar

Icon	Description
ISH	Toggle between the current image, other reference images or the <a href="#">expression</a> view

	Click to open adjustable image filters
	Find nearest reference image in the adjacent viewer
	Download the current image

## Scale Bar



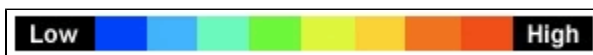
Shows the current viewing resolution of the image, in microns. This value dynamically changes as you zoom in/out of the image. You can position the scale bar anywhere on the main image by dragging the scale bar by its ruler.

You can toggle the orientation of the scale bar from horizontal to vertical by clicking on the scale bar text. When you download an image, the scale bar is not included with the image.

## Keyboard Commands

Key	Description
F	Advance to the next image in the series
D	Go back to the previous image
R	Advance to the last image in the series
E	Go back to the first image in the series
A	Zoom in
Z	Zoom out

## Expression Mask Colors



The Expression Mask image display highlights those cells that have the highest probability of gene expression using a heat map color scale (from low/blue to high/red).