

**Spider: RecoBundles****Version: 1.0.1****Creation Date: July 7, 2020****Authors:**

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Project : LANDMAN\_UPGRAD

Subject : 229415

Session : 229919

Resources : 301, LANDMAN\_UPGRAD-x-229415-x-229919-x-801-x-dtiQA\_v6

Number of Seeds : 1000000

Tracking Method : probabilistic

Atlas Directory : /SUPPLEMENTAL/dipy-Atlas\_80\_Bundles

Run Date : 2020-07-11 00:38:31.572630

**Methods Summary**

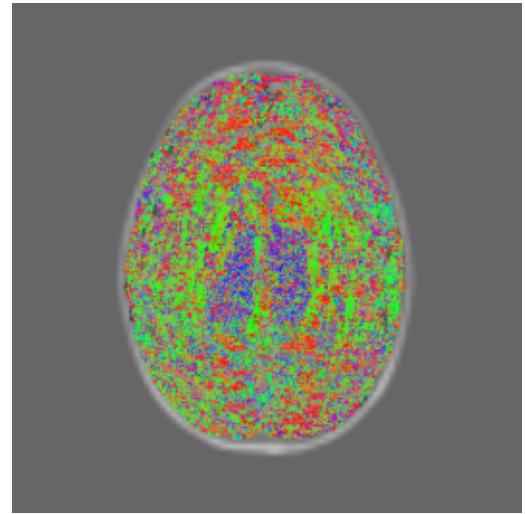
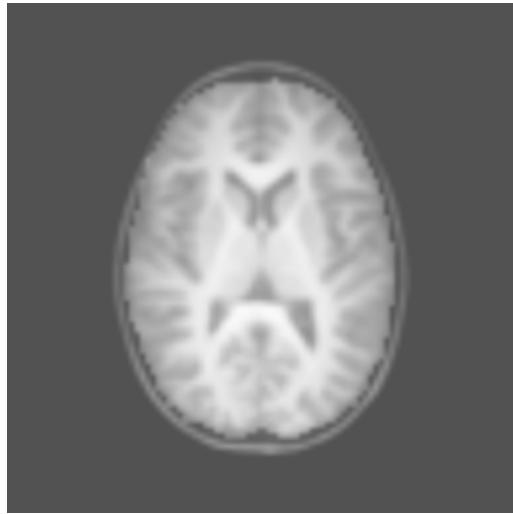
RecoBundles is a white matter bundle recognition method developed by Garyfallidis et al [1]. It uses streamline registration and clustering to extract streamline bundles from the patient streamline space based on prior model bundles. In this implementation, preprocessed diffusion data are first converted to a tractogram. The fiber orientation distribution is calculated via constrained spherical deconvolution [2], which is then used to perform probabilistic fiber tracking. This tractogram is next registered to the model space [3], and the RecoBundles algorithm is applied to extract up to 78 streamline bundles. The Diffusion in Python (Dipy) software package was used to implement the RecoBundles algorithm and all tracking operations [4].

**References**

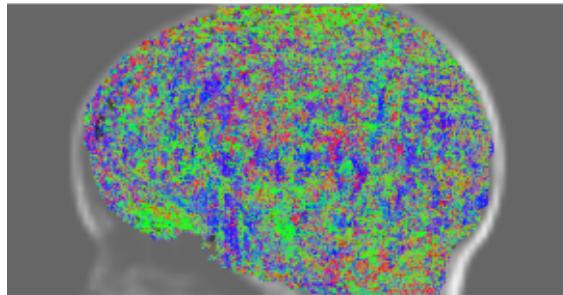
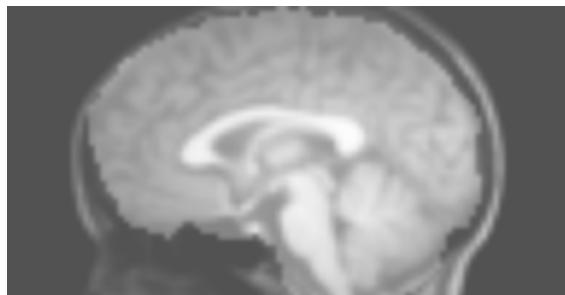
- [1] E. Garyfallidis et al., "Recognition of white matter bundles using local and global streamline-based registration and clustering," *Neuroimage*, vol. 170, pp. 283-295, 2018.
- [2] M. Descoteaux, R. Deriche, T. R. Knösche, and A. Anwander, "Deterministic and probabilistic tractography based on complex fibre orientation distributions," *IEEE Trans. Med. Imaging*, vol. 28, no. 2, pp. 269-286, 2009.
- [3] E. Garyfallidis, O. Ocegueda, D. Wassermann, and M. Descoteaux, "Robust and efficient linear registration of white-matter fascicles in the space of streamlines," *Neuroimage*, vol. 117, pp. 124-140, 2015.
- [4] E. Garyfallidis et al., "Dipy, a library for the analysis of diffusion MRI data," *Front. Neuroinform.*, vol. 8, no. FEB, pp. 1-17, 2014.

# Whole-Brain Mask & Tractogram

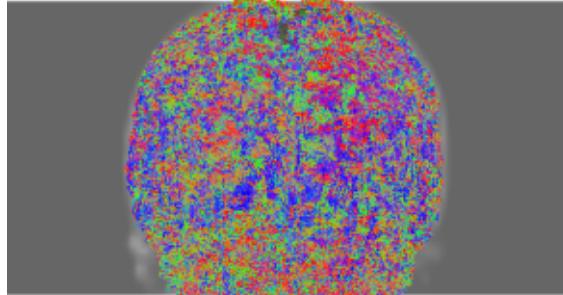
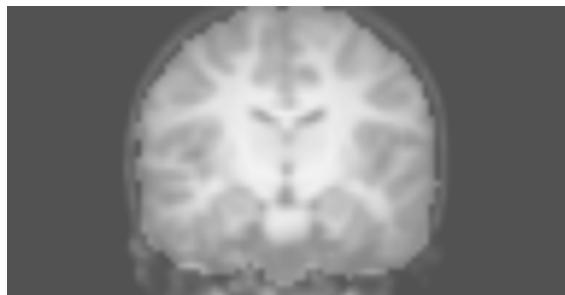
Axial



Sagittal



Coronal

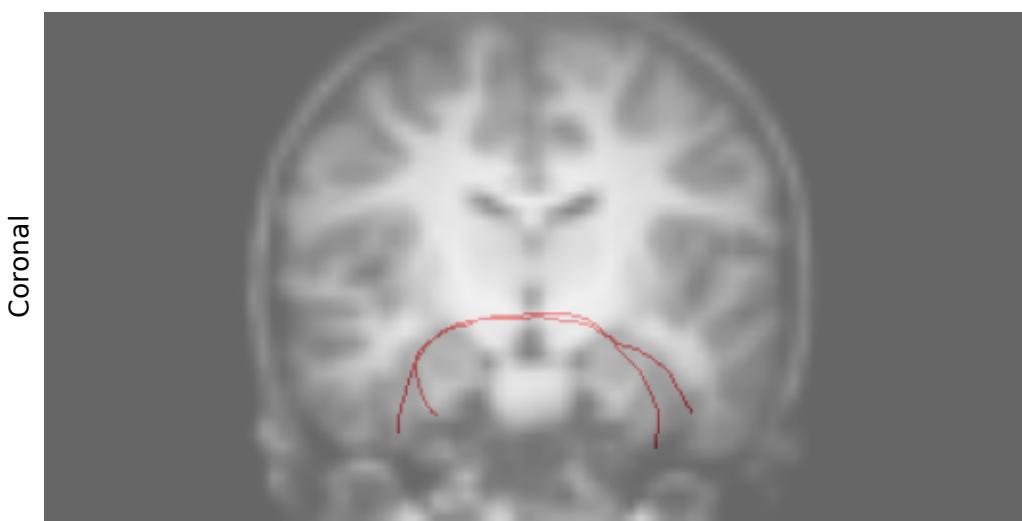
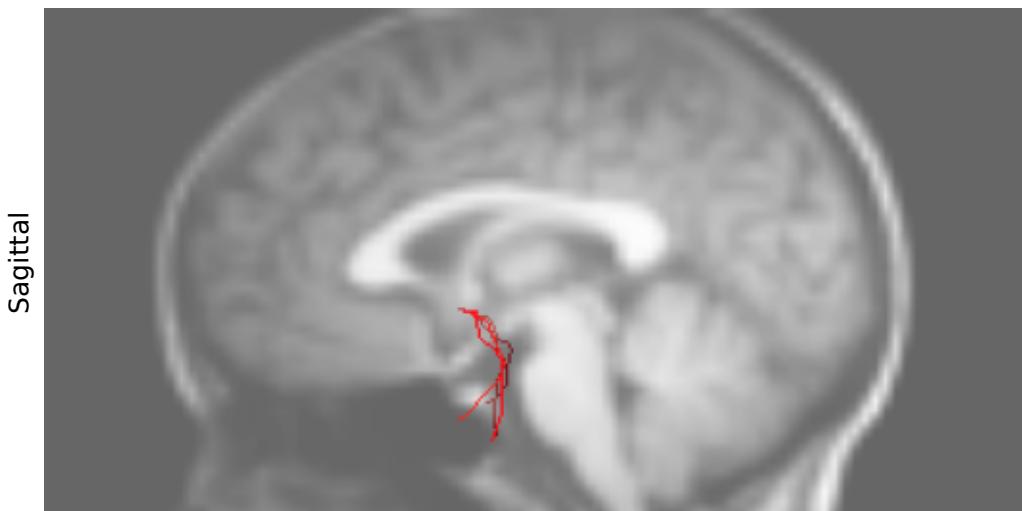
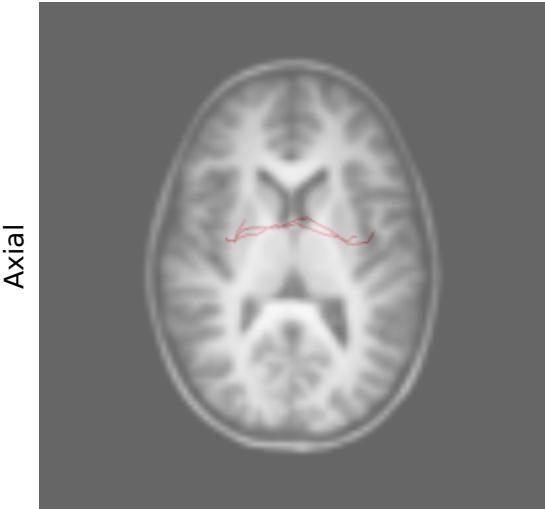


# 76 of 78 Bundles Found

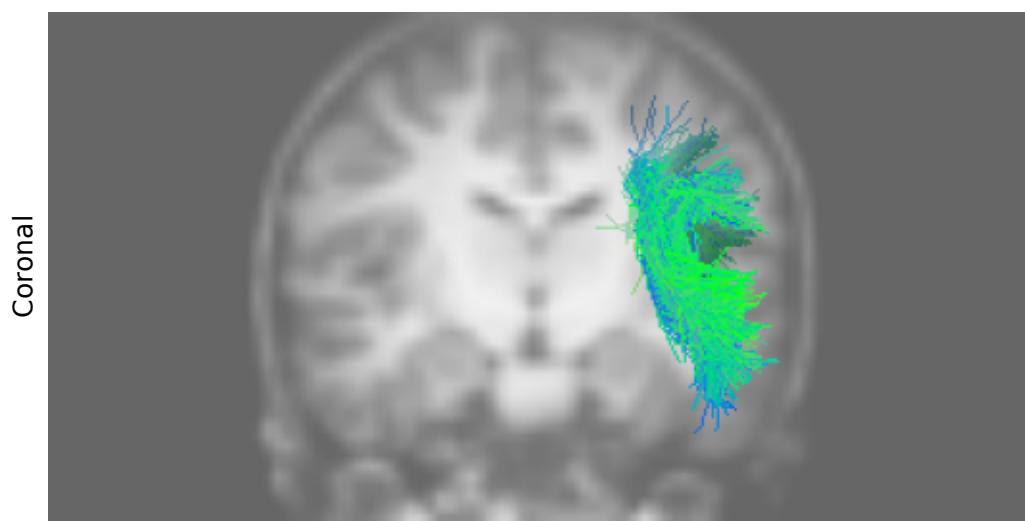
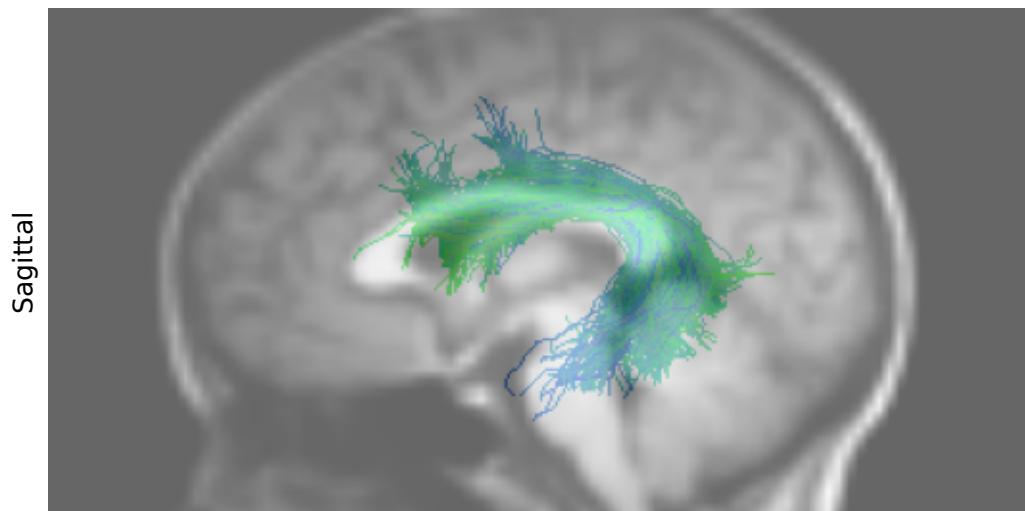
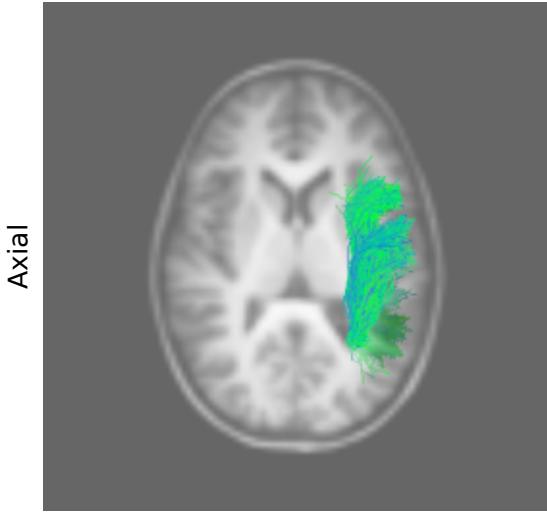
AC	AF_L	AF_R	AR_L	AR_R	AST_L	AST_R	CB_L	CB_R	CC
CCMid	CC_ForcepsMajor	CC_ForcepsMinor	CNIII_L	CNIII_R	CNII_L	CNII_R	CNIV_L	CNIV_R	CNVIII_L
CNVIII_R	CNVII_L	CNVII_R	CNV_L	CNV_R	CST_L	CST_R	CS_L	CS_R	CTT_L
CTT_R	CT_L	CT_R	C_L	C_R	DLF_L	DLF_R	EMC_L	EMC_R	FPT_L
FPT_R	F_L_R	ICP_L	ICP_R	IFOF_L	IFOF_R	ILF_L	ILF_R	LL_L	LL_R
MCP	MLF_L	MLF_R	ML_L	ML_R	MdLF_L	MdLF_R	OPT_L	OPT_R	OR_L
OR_R	PC	PPT_L	PPT_R	RST_L	RST_R	SCP	SLF_L	SLF_R	STT_L
STT_R	TPT_L	TPT_R	UF_L	UF_R	V	VOF_L	VOF_R		

AC = Anterior Commissure	AF_L = Arcuate Fasciculus - L	AF_R = Arcuate Fasciculus - R	AR_L = Acoustic Radiation - L
AR_R = Acoustic Radiation - R	AST_L = Frontal Aslant Tract - L	AST_R = Frontal Aslant Tract - R	CB_L = Cerebellum - L
CB_R = Cerebellum - R	CC = Full corpus callosum	CCMid = Corpus Callosum Mid	CC_ForcepsMajor = Corpus Callosum Major
CC_ForcepsMinor = Corpus Callosum Minor	CNIII_L = Oculomotor nerve - L	CNIII_R = Oculomotor nerve - R	CNII_L = Optic nerve - L
CNII_R = Optic nerve - R	CNIV_L = Trochlear nerve - L	CNIV_R = Trochlear nerve - R	CNVII_L = Cranial/Vestibulocochlear/pure sensorial nerves - L
CNVIII_R = Cranial/Vestibulocochlear/pure sensorial nerves - R	CNVII_L = Facial Nerve - L	CNVI_R = Facial Nerve - R	CNV_L = Choroidal neovascularization - L
CNV_R = Choroidal neovascularization - R	CST_L = Corticospinal Tract - L	CST_R = Corticospinal Tract - R	CS_L = Corticostratial Pathway - L
CS_R = Corticostratial Pathway - R	CTT_L = Central Tegmental Tract - L	CTT_R = Central Tegmental Tract - R	CT_L = Corticothalamic Pathway - L
CT_R = Corticothalamic Pathway - R	C_L = Cingulum - L	C_R = Cingulum - R	DLF_L = Dorsal Longitudinal Fasciculus - L
DLF_R = Dorsal Longitudinal Fasciculus - R	EMC_L = Extreme Capsule - L	EMC_R = Extreme Capsule - R	FPT_L = Frontopontine Tract - L
FPT_R = Frontopontine Tract - R	F_L_R = Fornix Left and Right merged	ICP_L = Inferior Cerebellar Peduncle - L	ICP_R = Inferior Cerebellar Peduncle - R
IFOF_L = Inferior Fronto-occipital Fasciculus - L	IFOF_R = Inferior Fronto-occipital Fasciculus - R	ILF_L = Inferior Longitudinal Fasciculus - L	ILF_R = Inferior Longitudinal Fasciculus - R
LL_L = Lateral Lemniscus - L	LL_R = Lateral Lemniscus - R	MCP = Middle Cerebellar Peduncle	MLF_L = Medial Longitudinal fasciculus - L
MLF_R = Medial Longitudinal fasciculus - R	ML_L = Medial Lemniscus - L	ML_R = Medial Lemniscus - R	MdLF_L = Middle Longitudinal Fasciculus - L
MdLF_R = Middle Longitudinal Fasciculus - R	OPT_L = Occipito Pontine Tract - L	OPT_R = Occipito Pontine Tract - R	OR_L = Optic Radiation - L
OR_R = Optic Radiation - R	PC = Posterior Commissure	PPT_L = Parieto Pontine Tract - L	PPT_R = Parieto Pontine Tract - R
RST_L = Rubrospinal Tract - L	RST_R = Rubrospinal Tract - R	SCP = Superior Cerebellar Peduncle	SLF_L = Superior longitudinal fasciculus - L
SLF_R = Superior longitudinal fasciculus - R	STT_L = Spinothalamic Tract - L	STT_R = Spinothalamic Tract - R	TPT_L = Temporopontine Tract - L
TPT_R = Temporopontine Tract - R	UF_L = Uncinate Fasciculus - L	UF_R = Uncinate Fasciculus - R	V = Vermis
VOF_L = Vertical Occipital Fasciculus - L	VOF_R = Vertical Occipital Fasciculus - R		

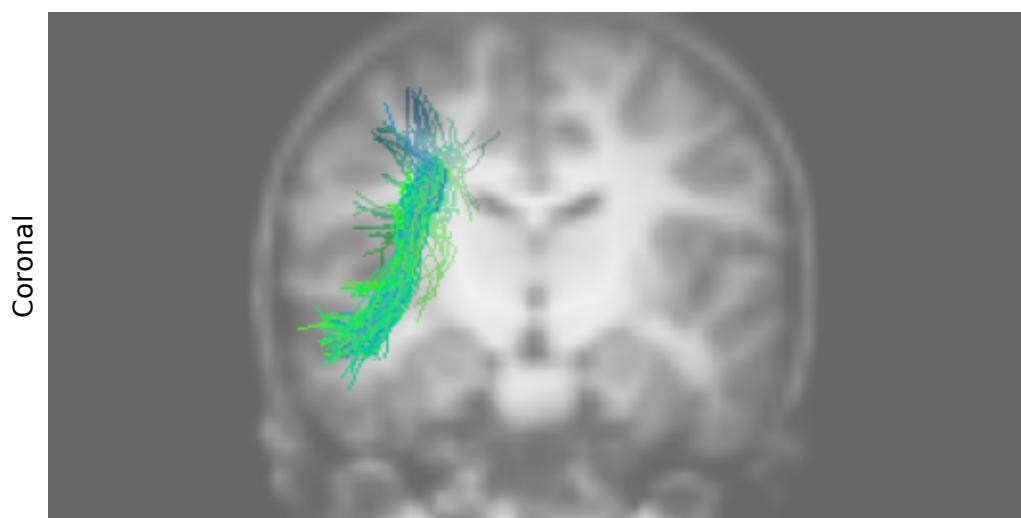
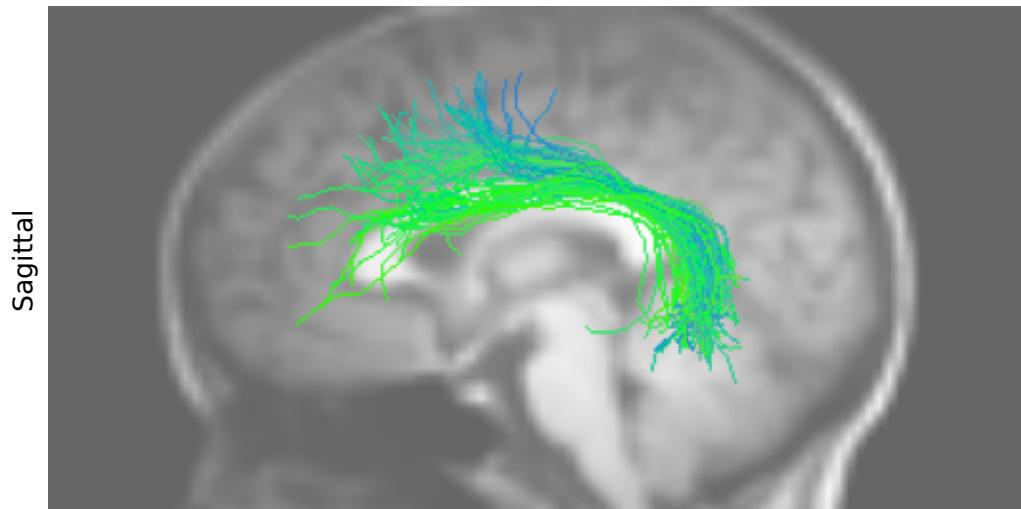
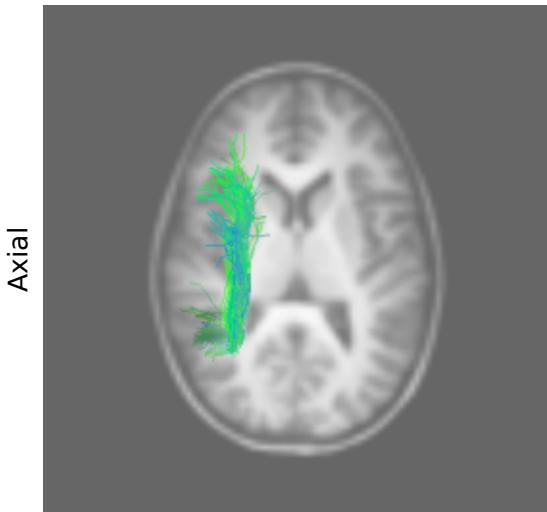
# Anterior Commissure (AC)



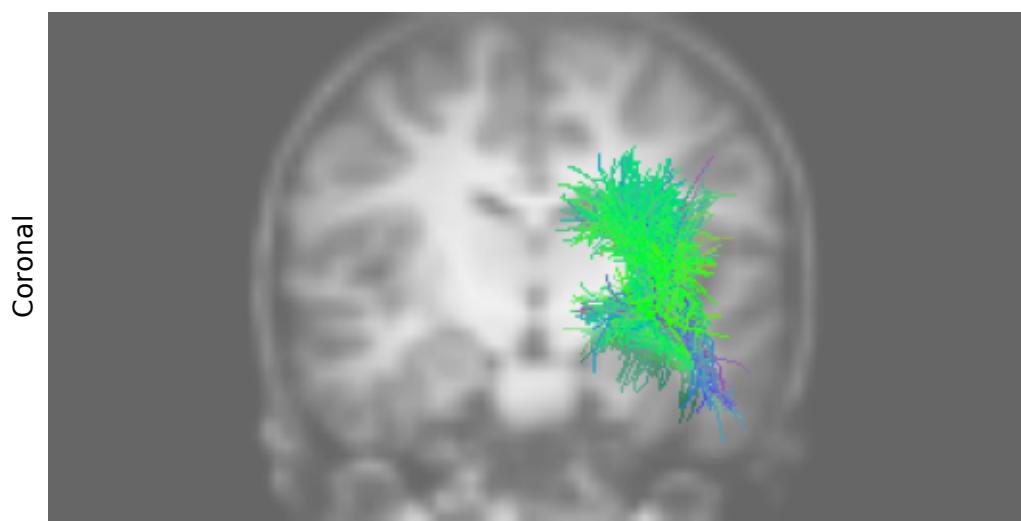
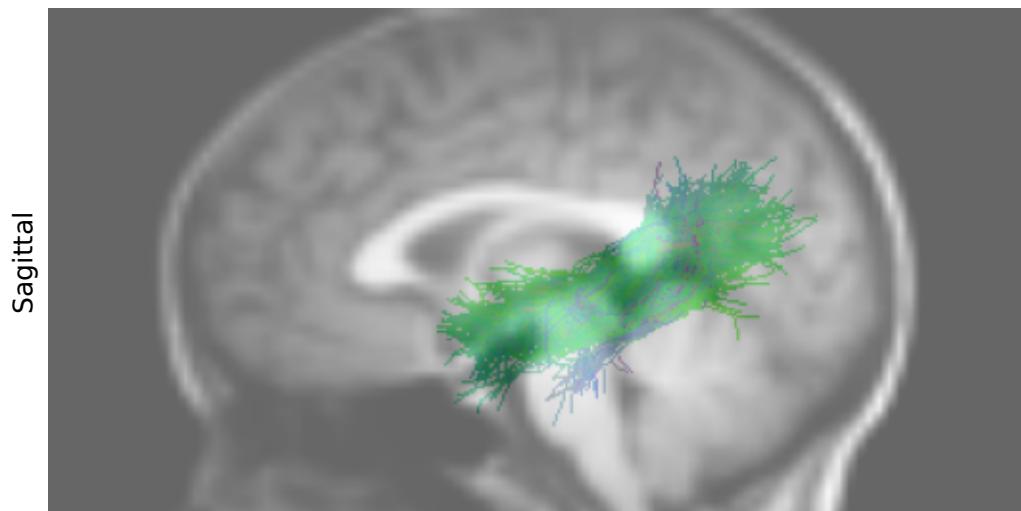
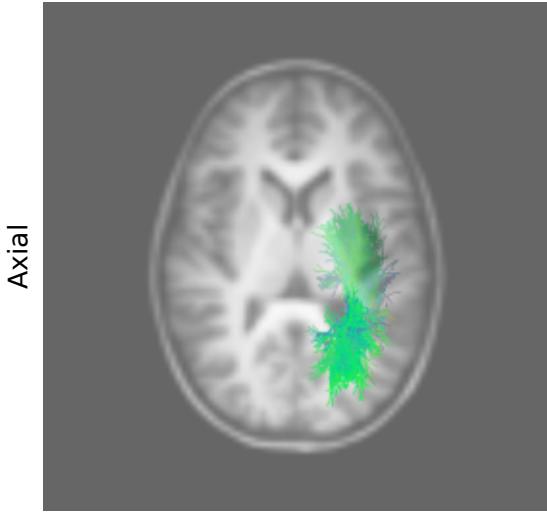
# Arcuate Fasciculus - L (AF\_L)



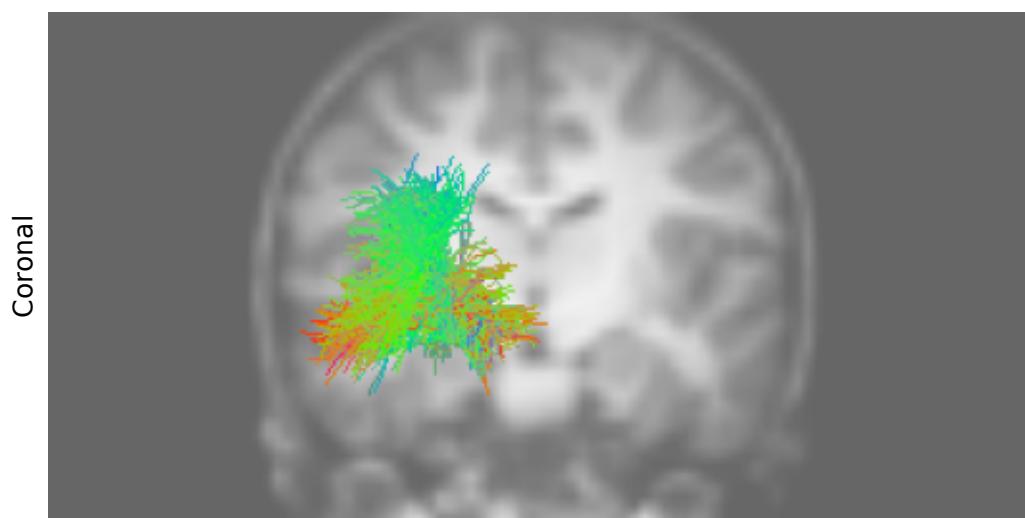
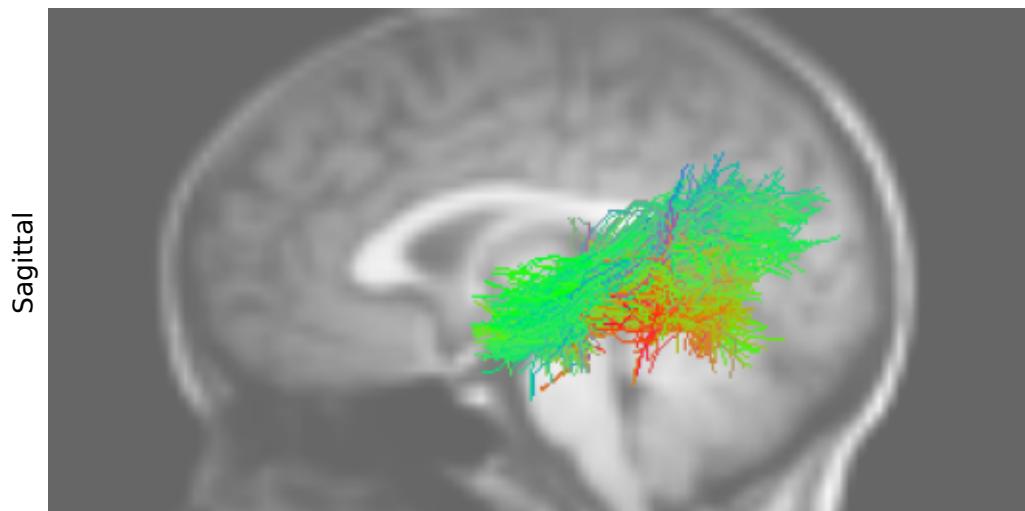
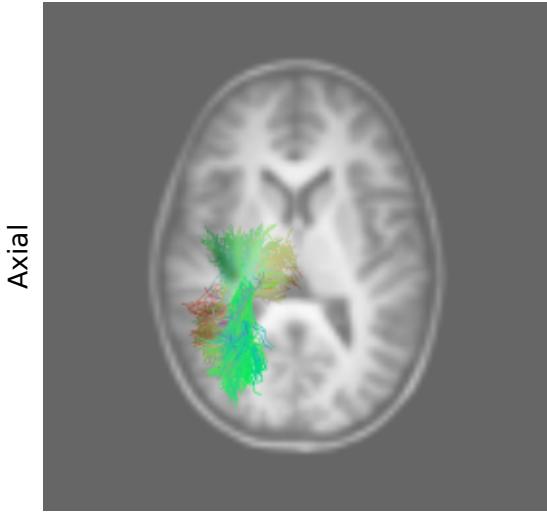
# Arcuate Fasciculus - R (AF\_R)



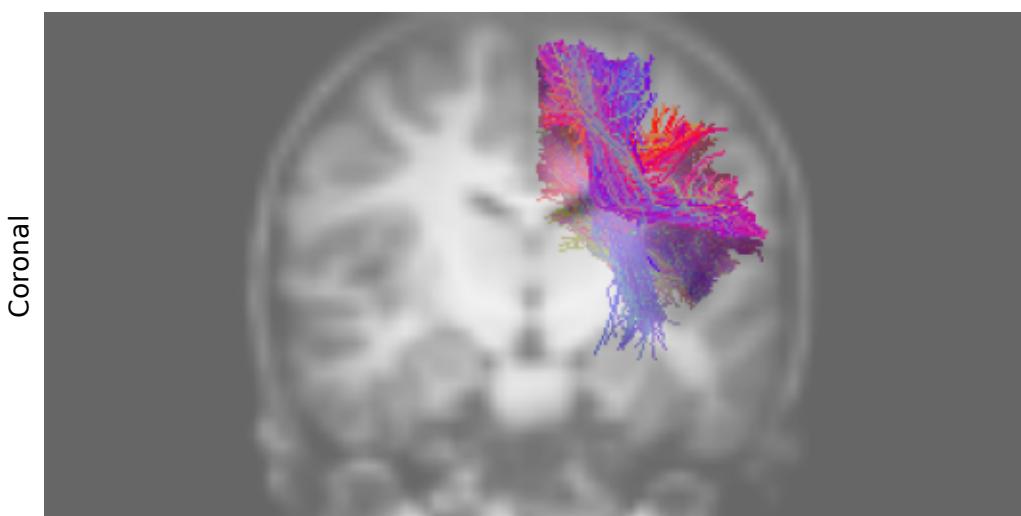
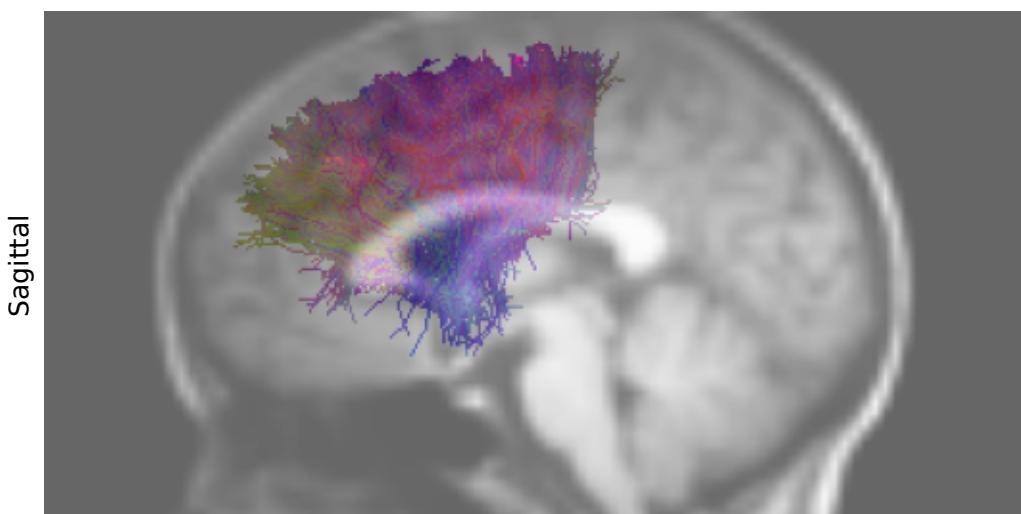
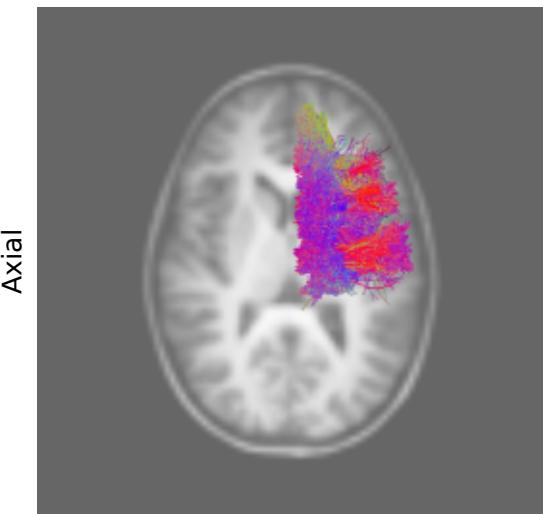
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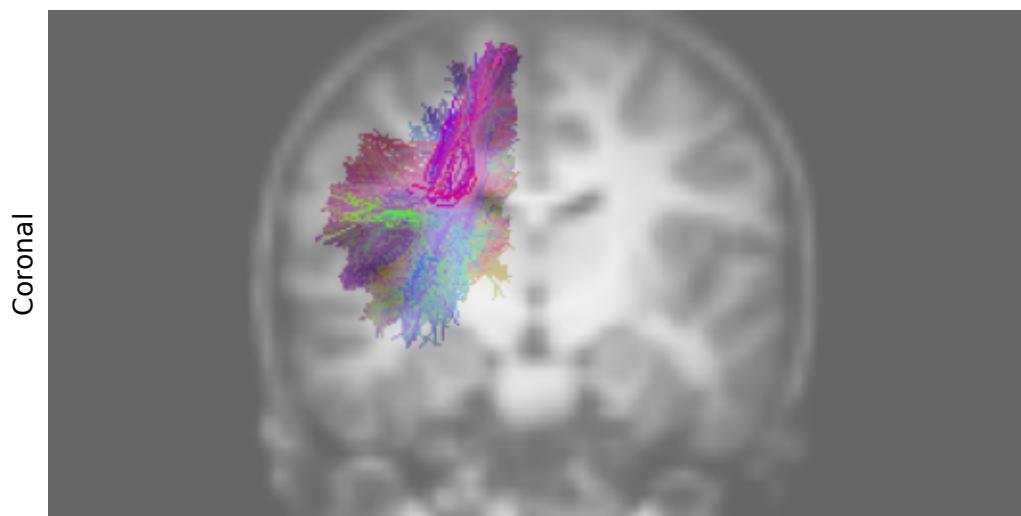
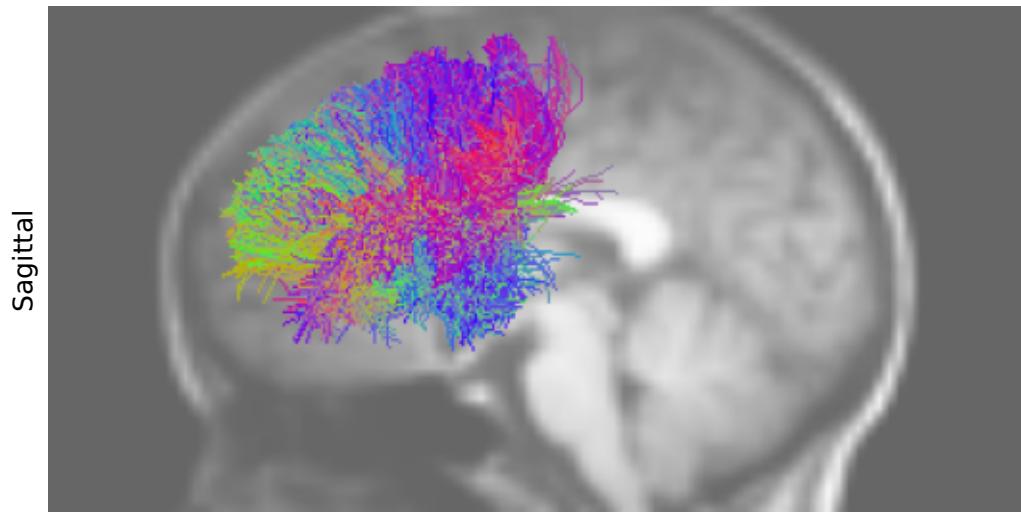
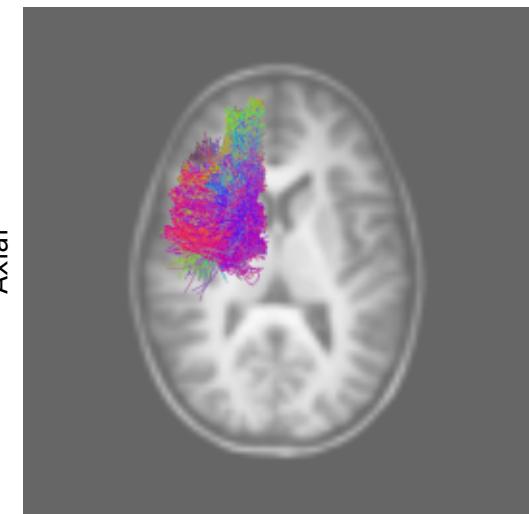
# Acoustic Radiation - R (AR\_R)



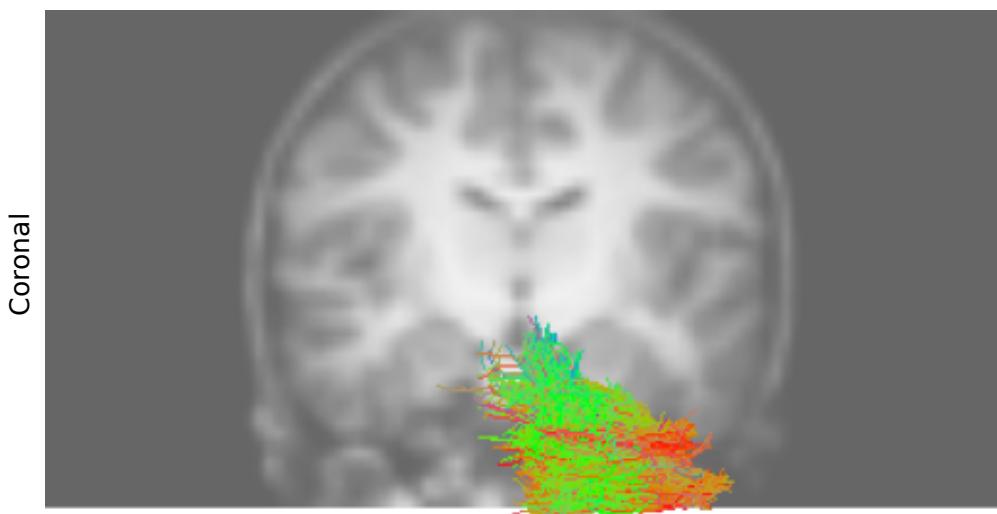
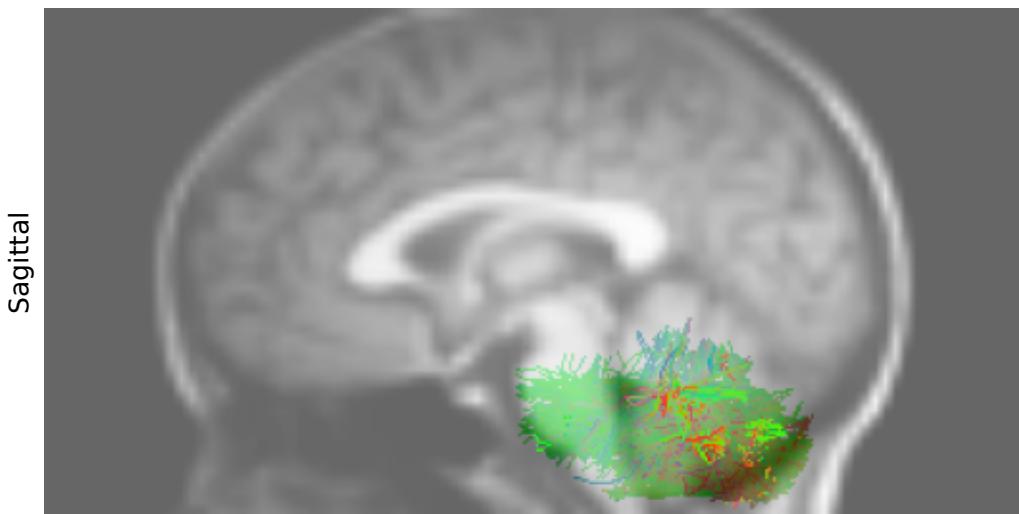
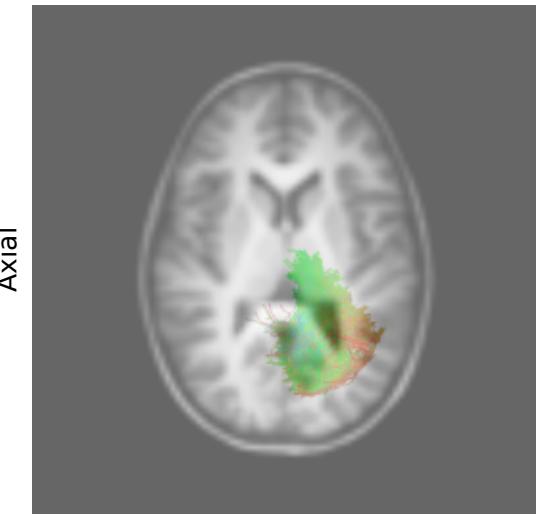
# Frontal Aslant Tract - L (AST\_L)



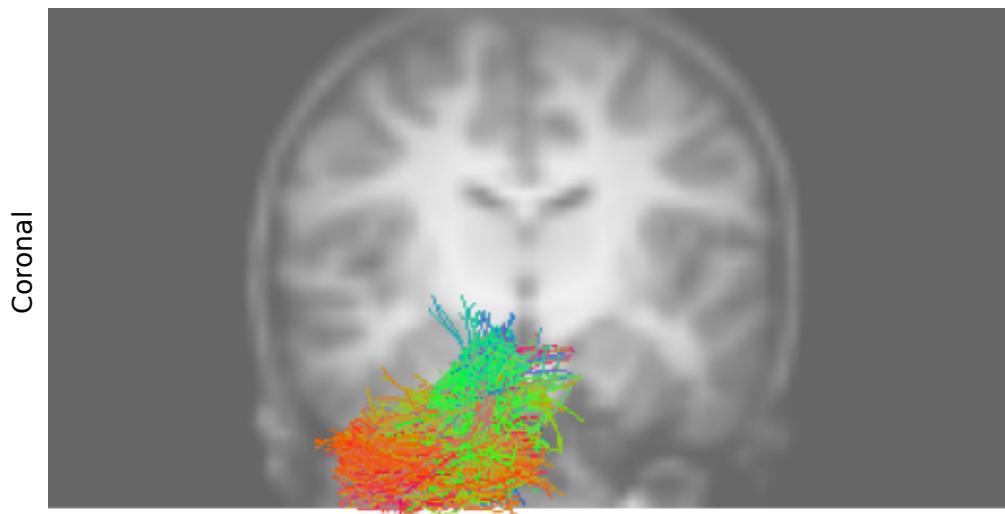
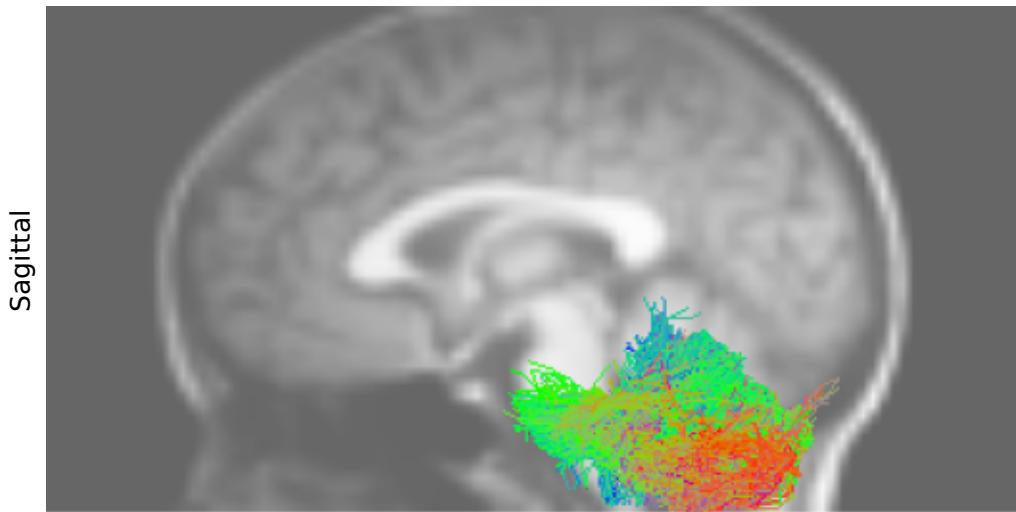
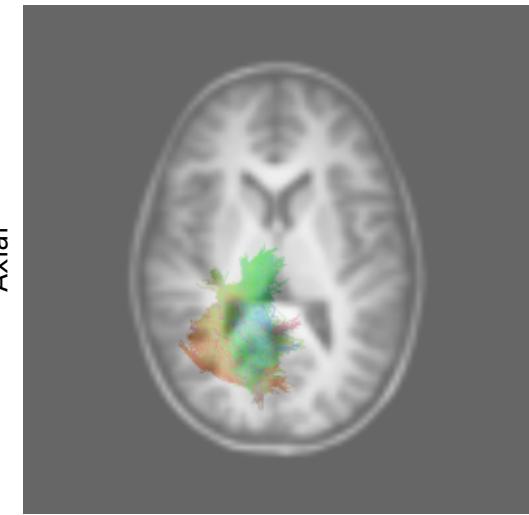
# Frontal Aslant Tract - R (AST\_R)



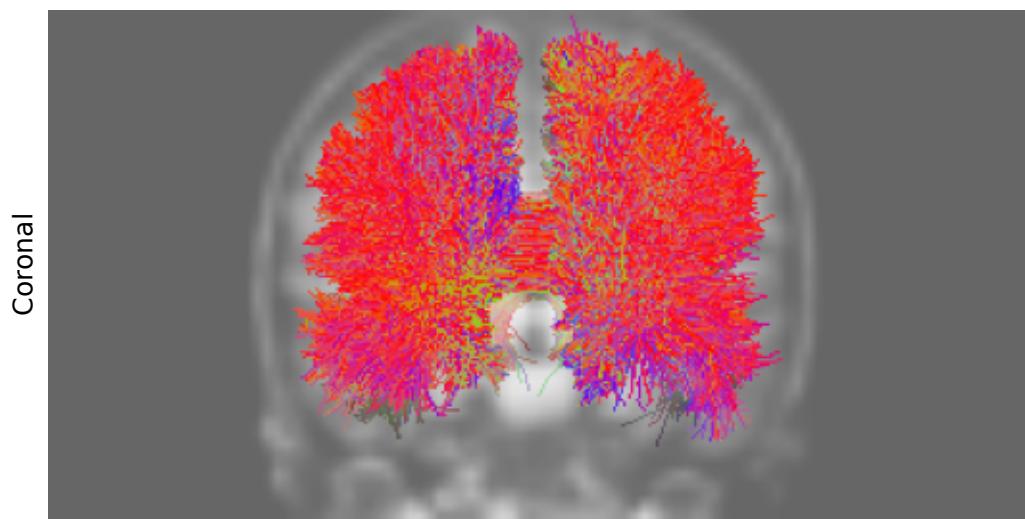
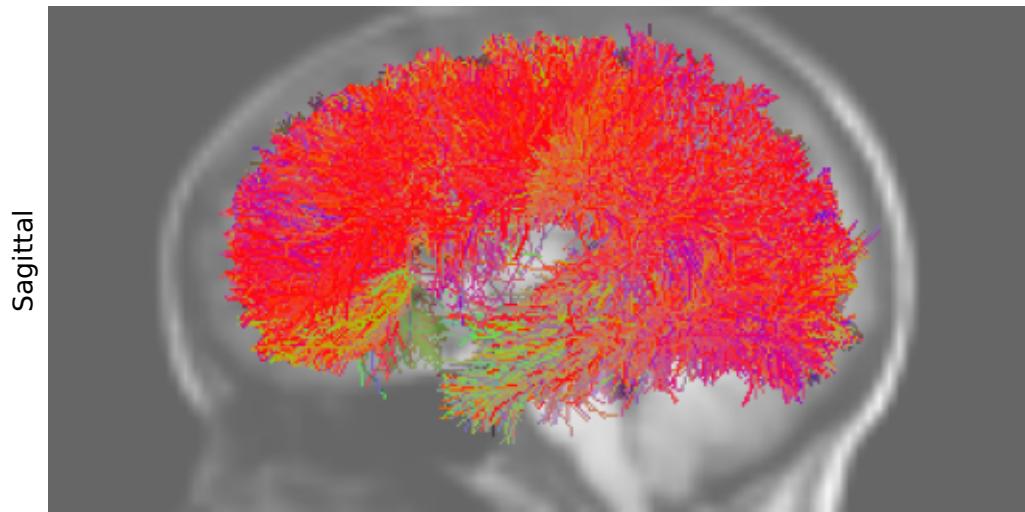
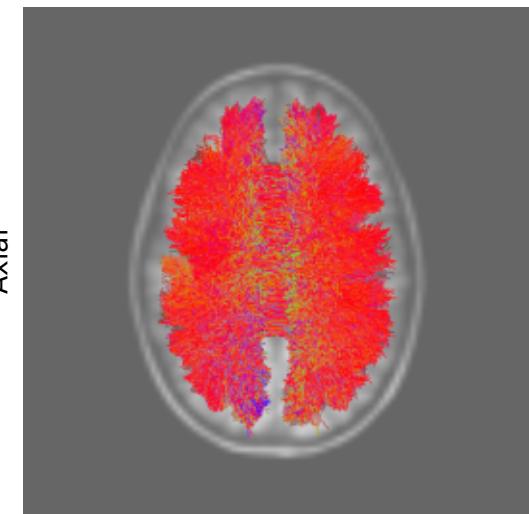
# Cerebellum - L (CB\_L)



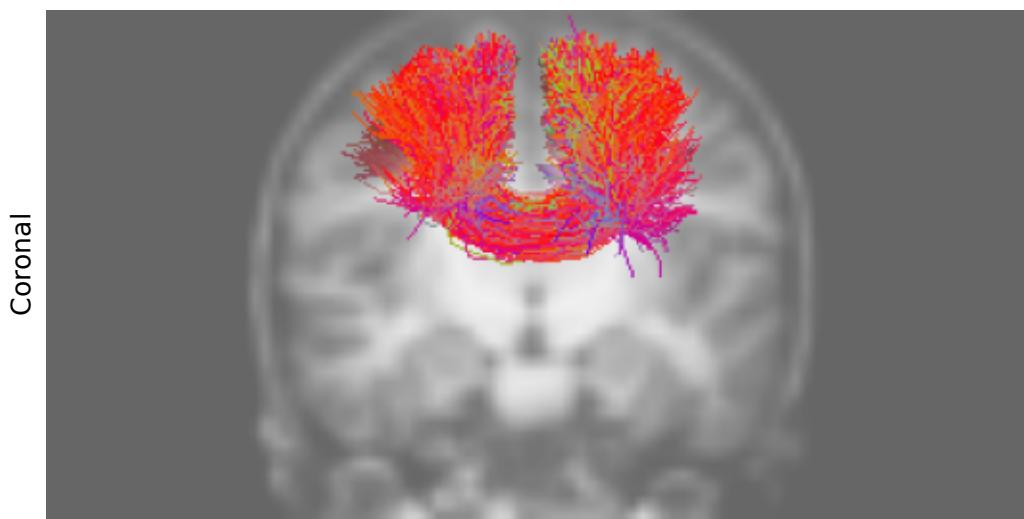
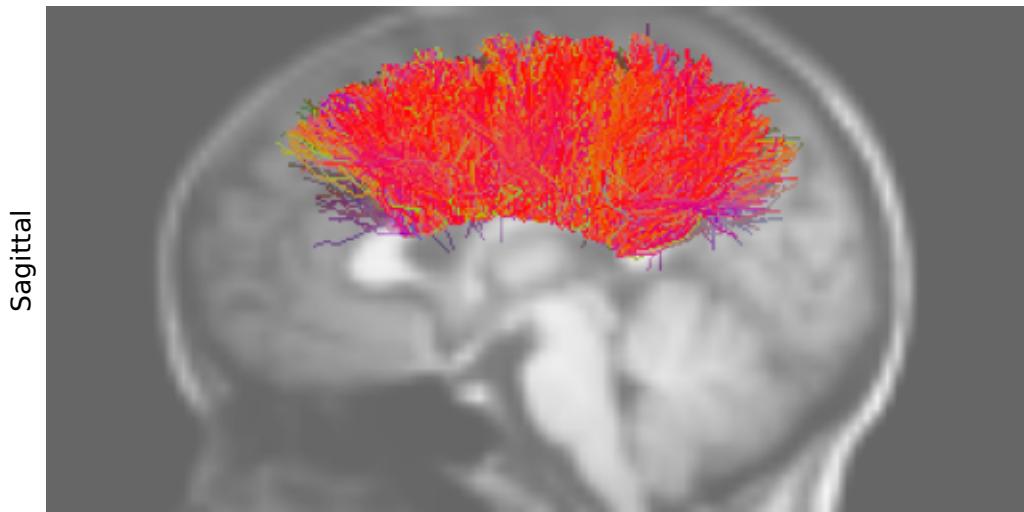
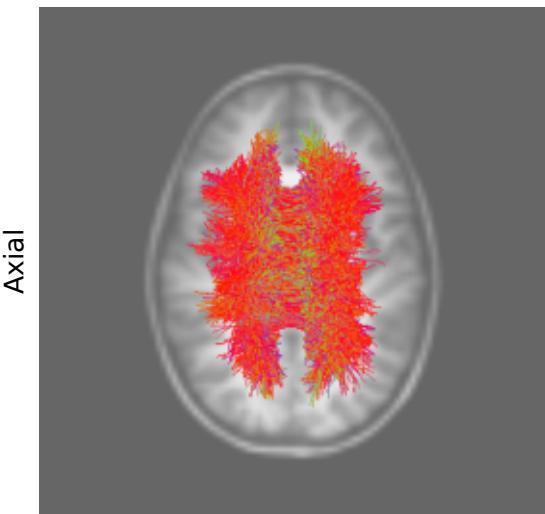
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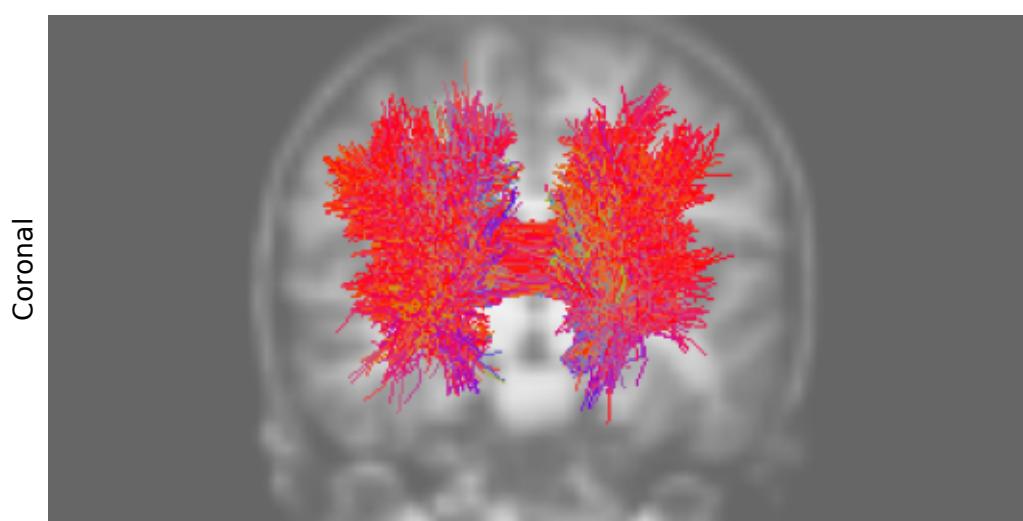
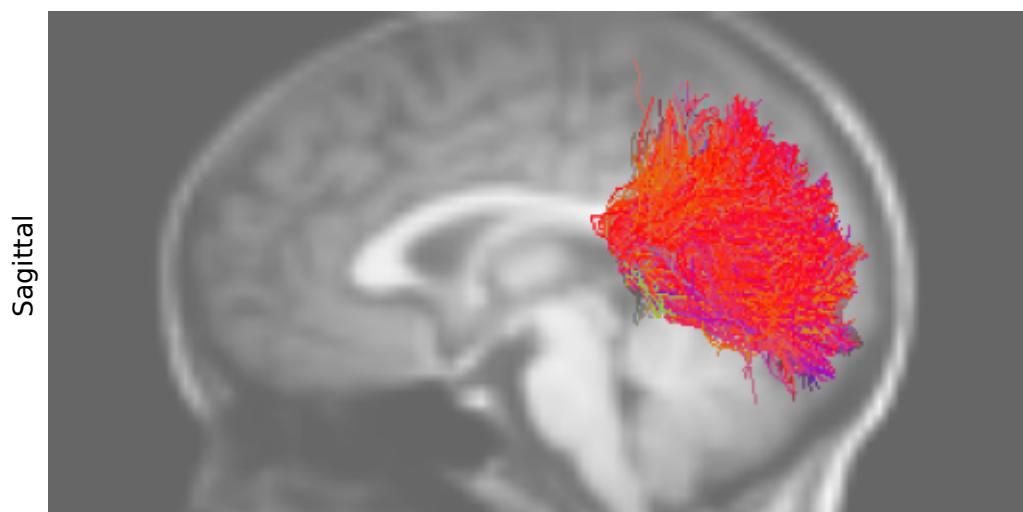
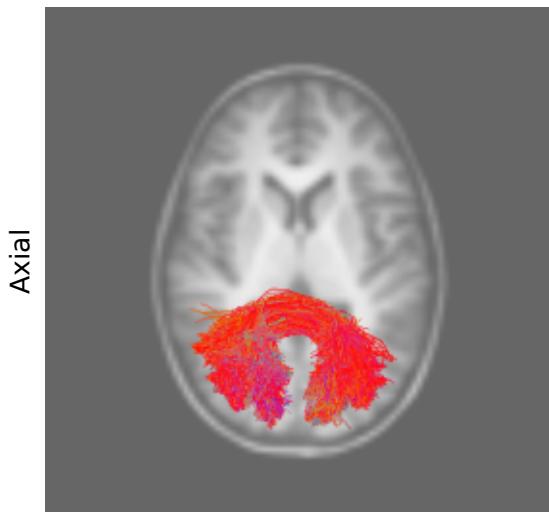
# Full corpus callosum (CC)



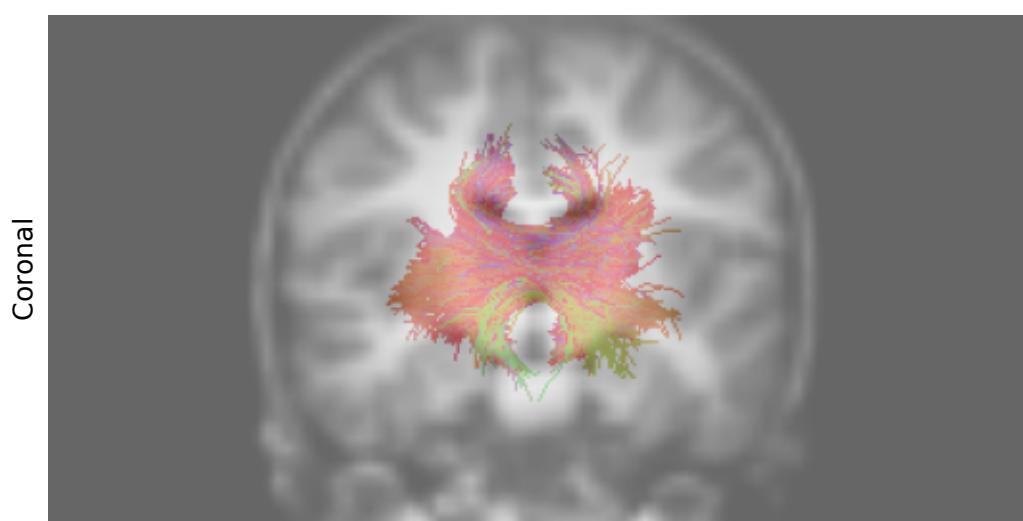
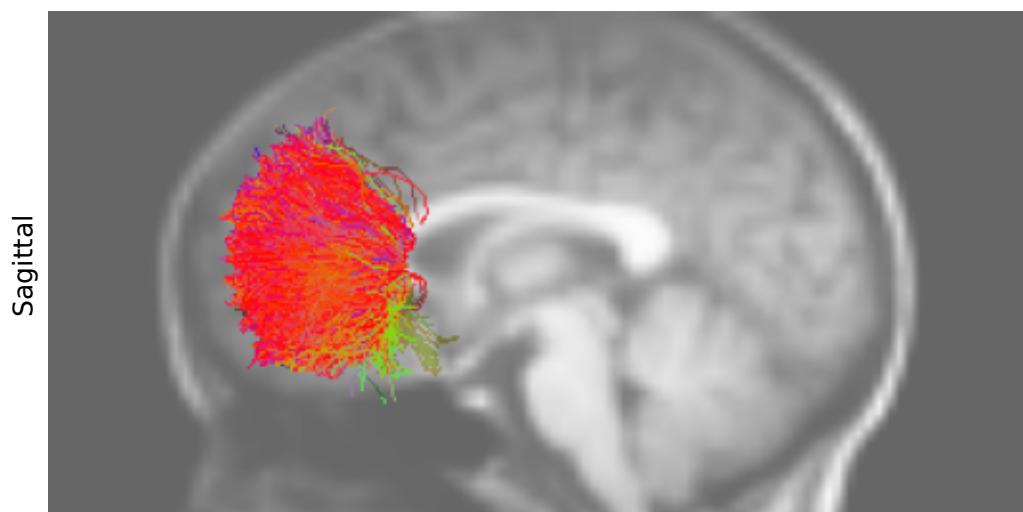
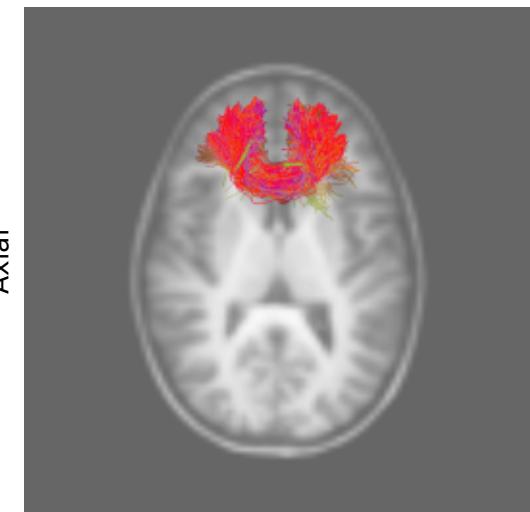
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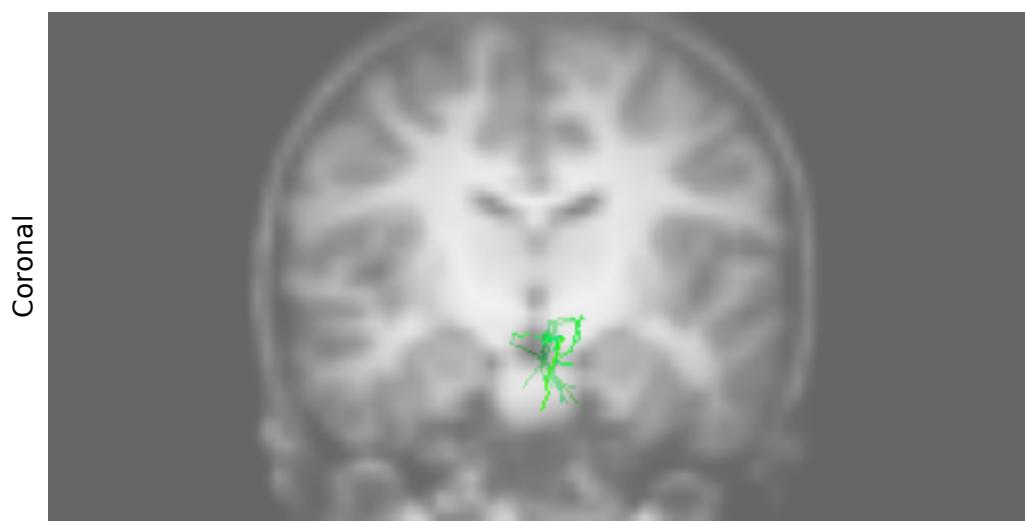
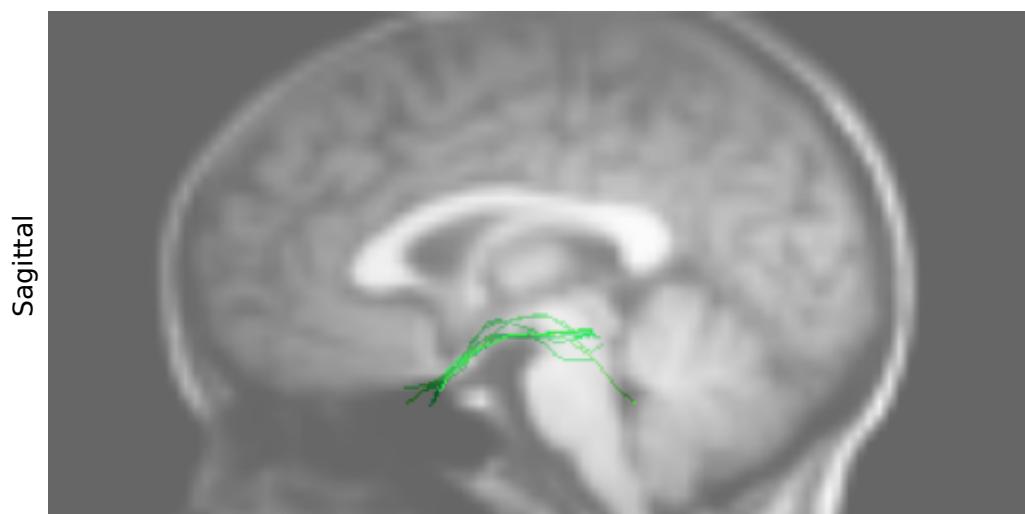
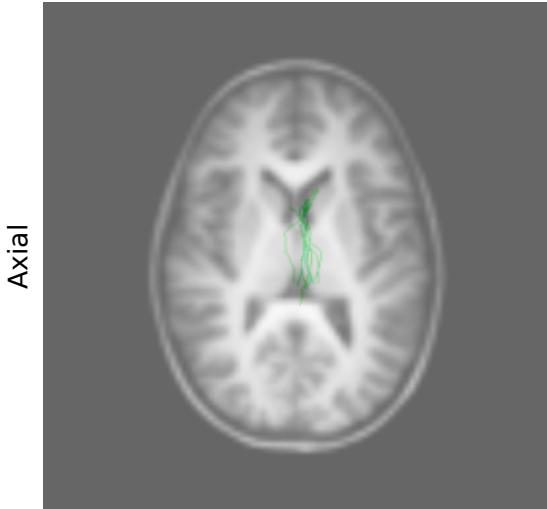
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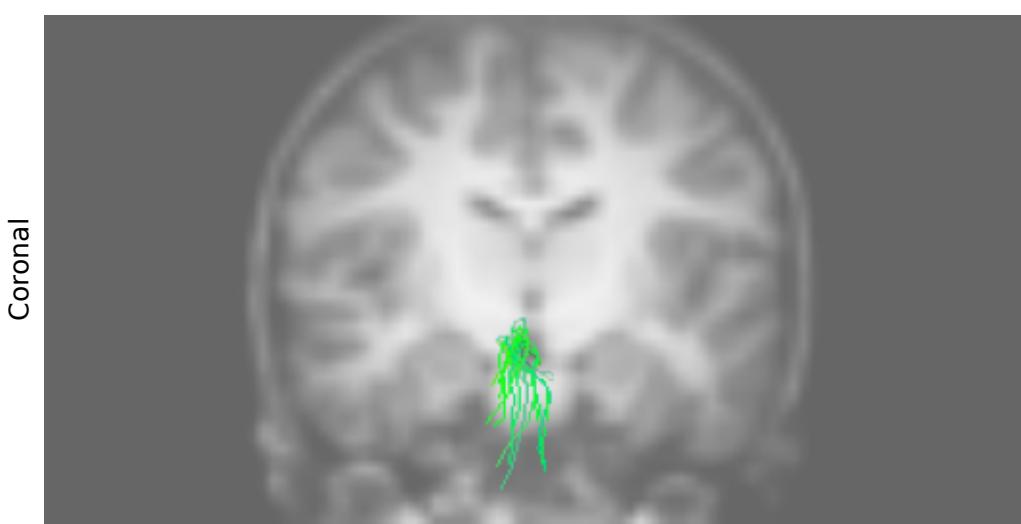
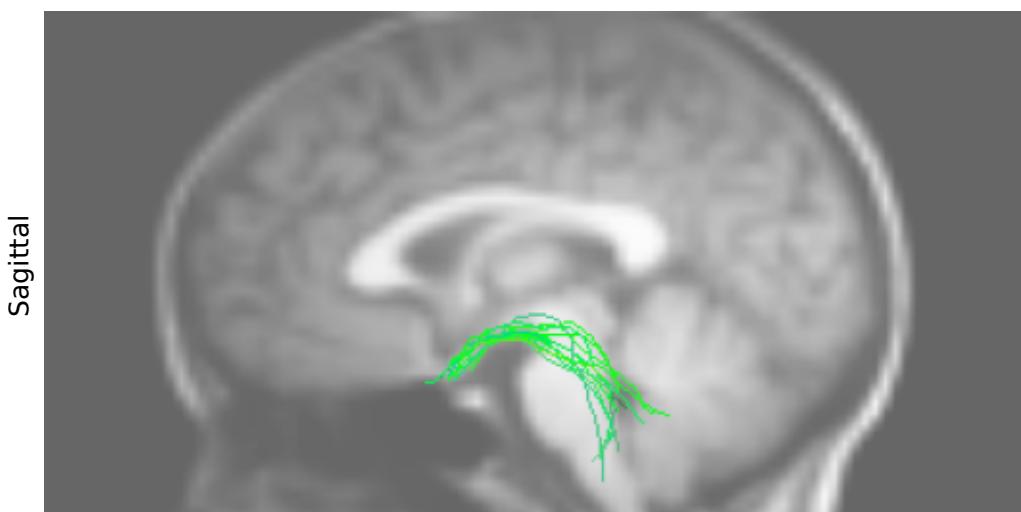
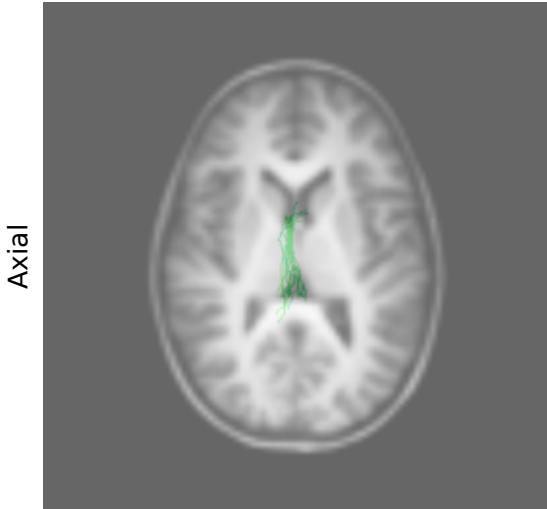
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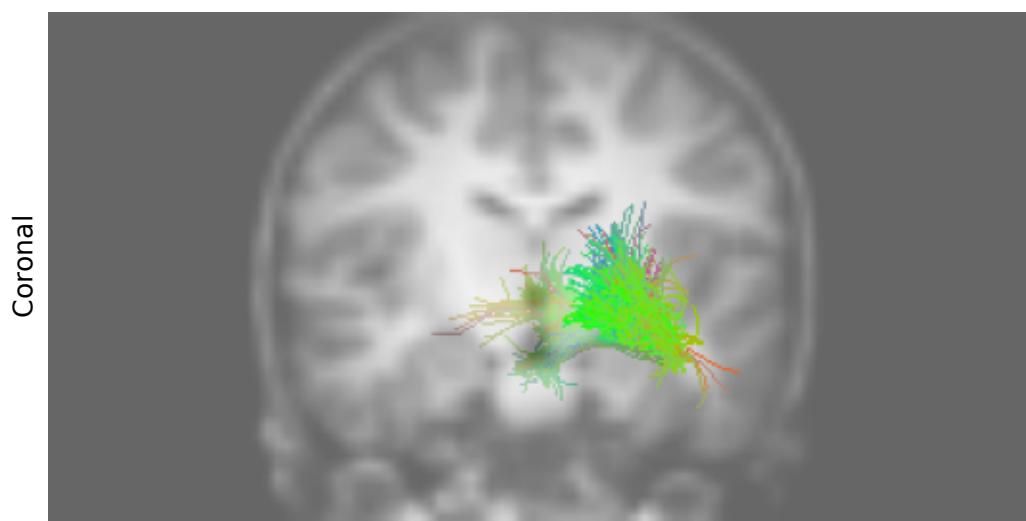
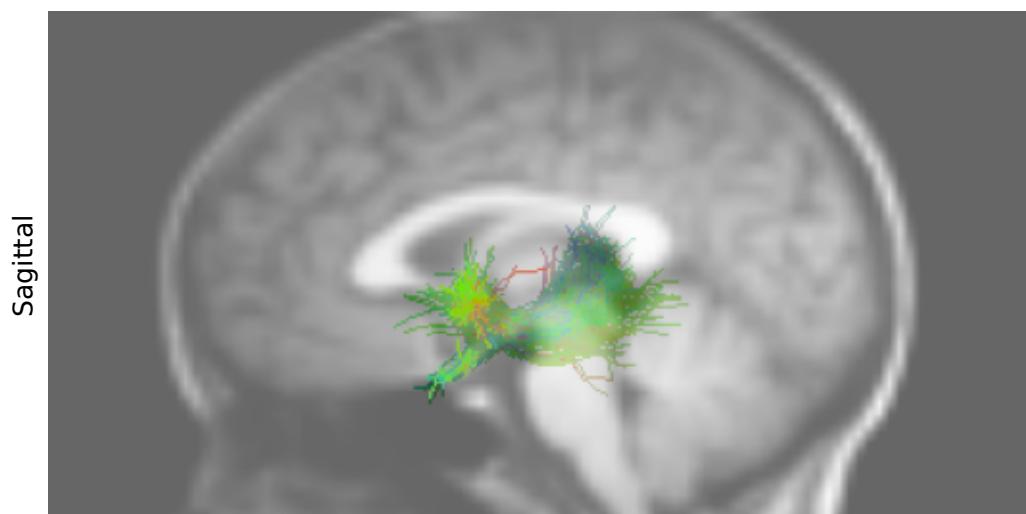
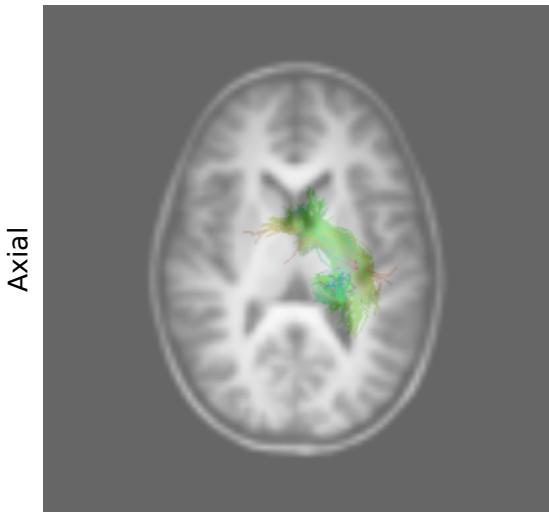
# Oculomotor nerve - L (CNIII\_L)



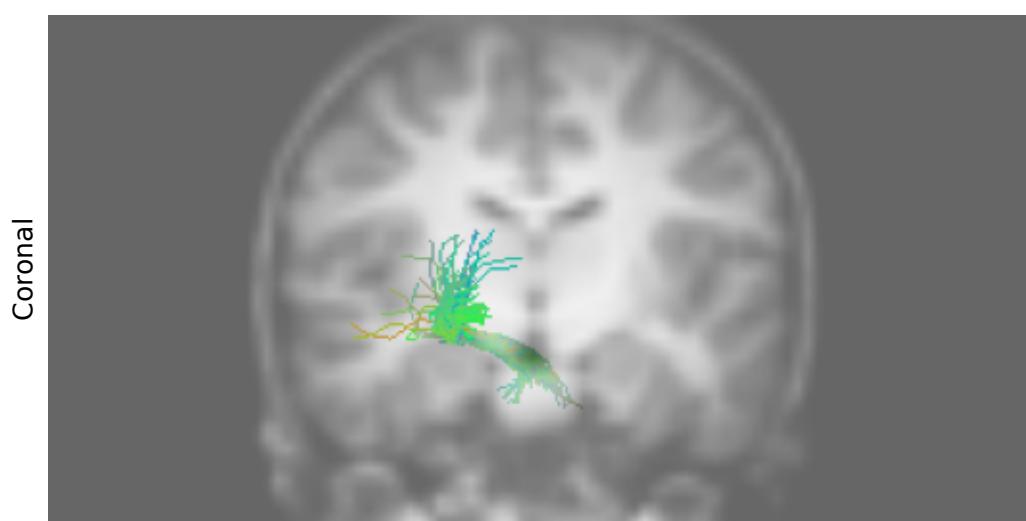
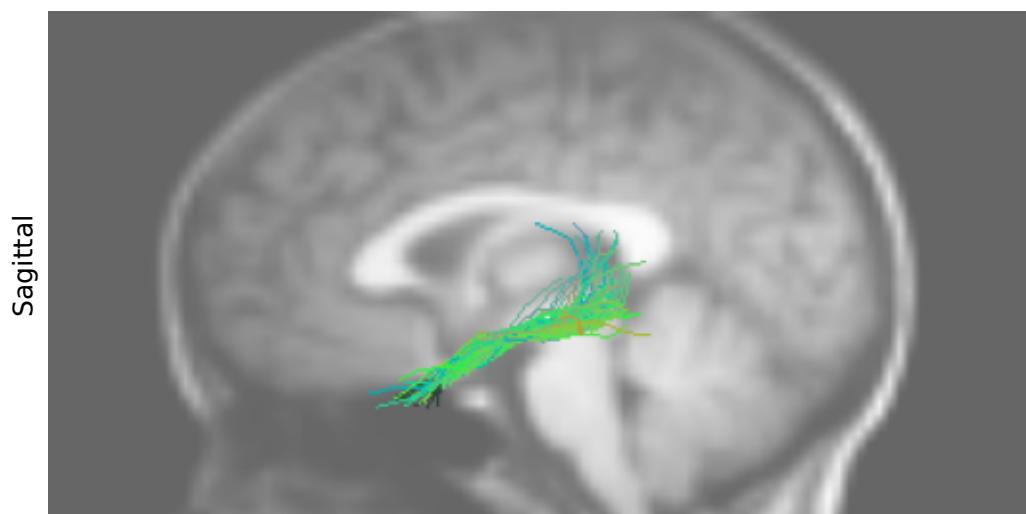
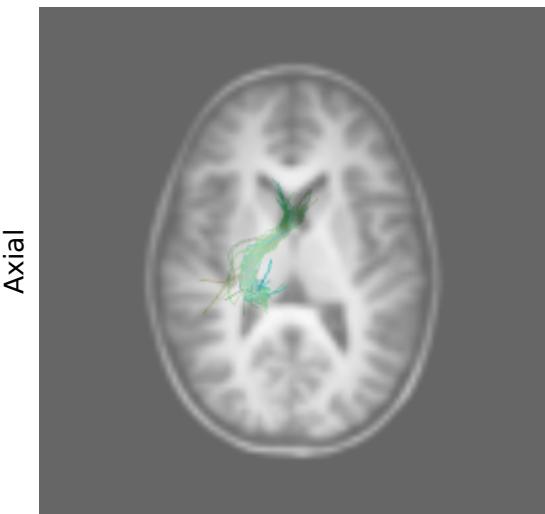
# Oculomotor nerve - R (CNIII\_R)



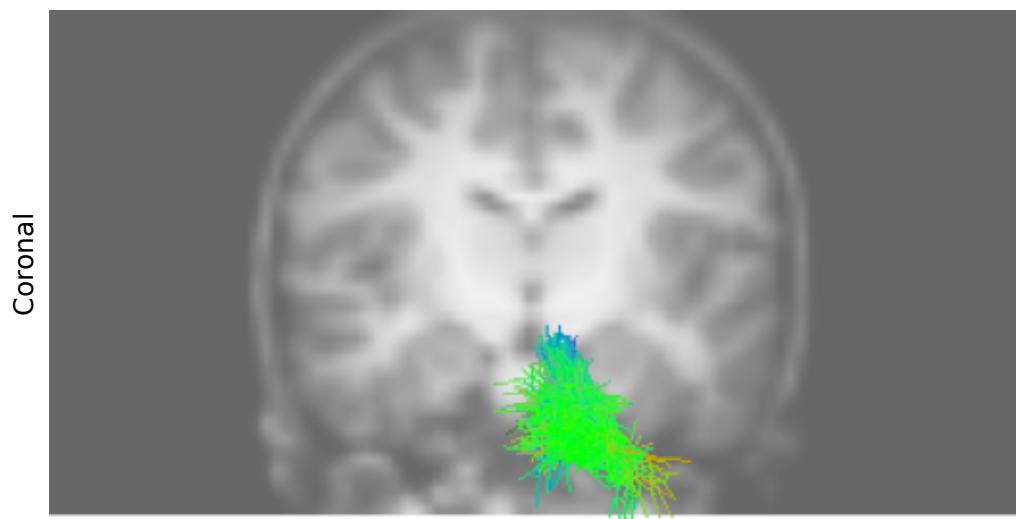
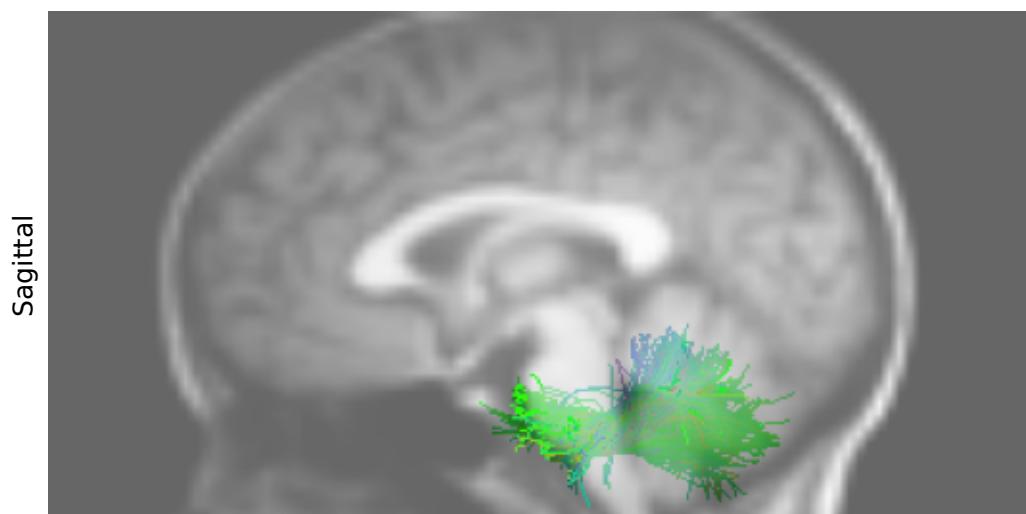
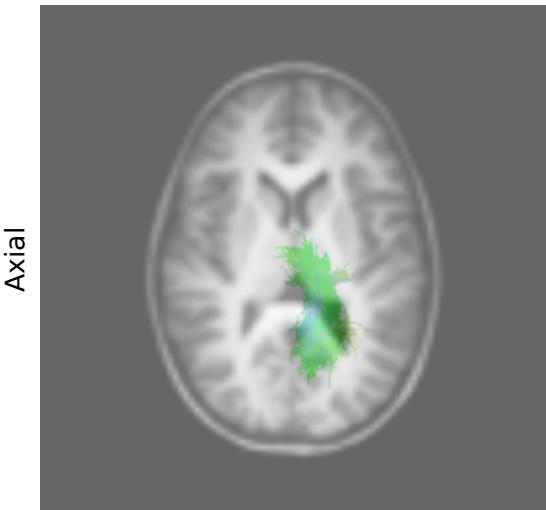
# Optic nerve - L (CNII\_L)



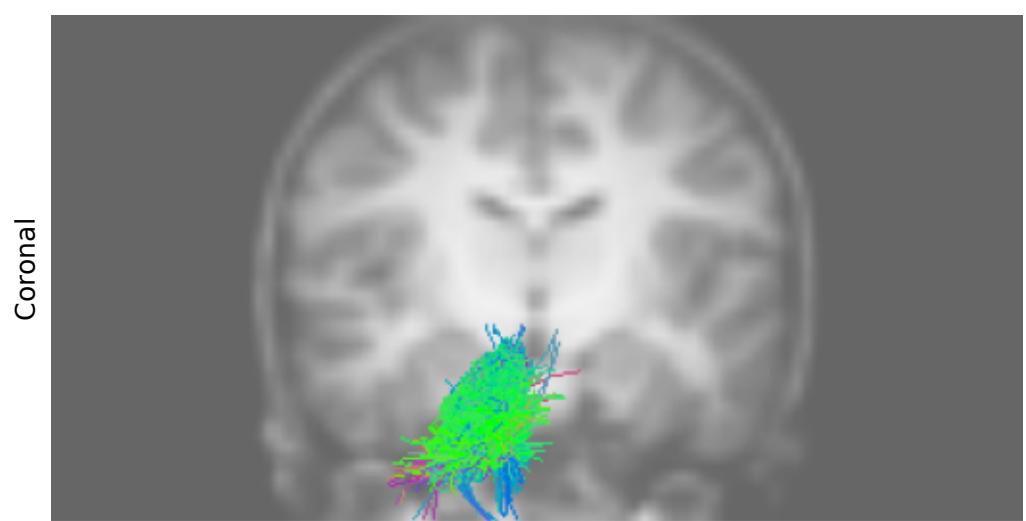
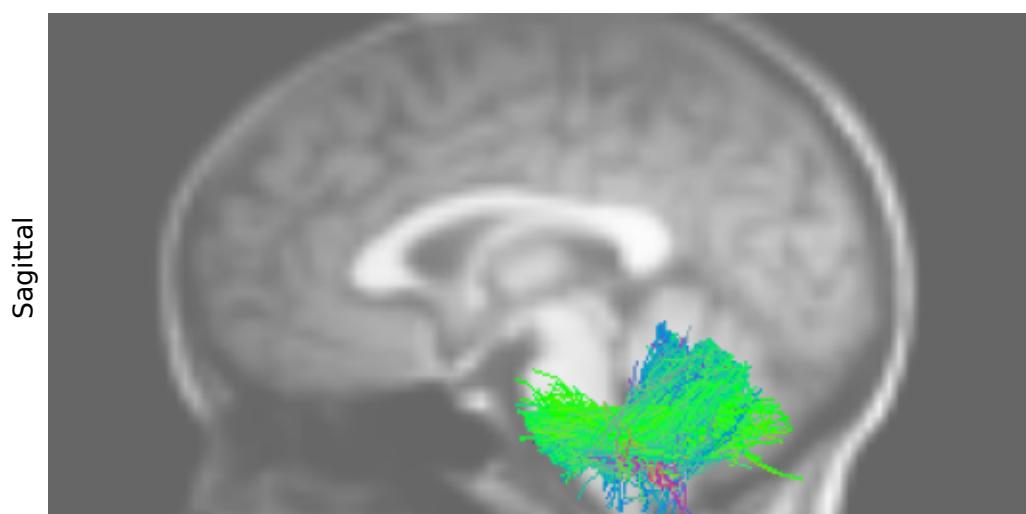
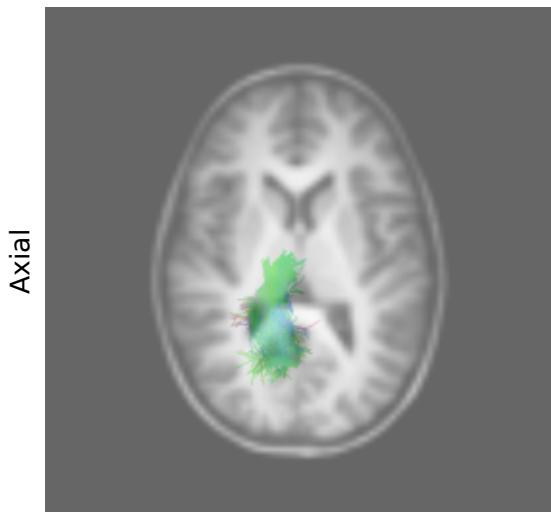
# Optic nerve - R (CNII\_R)



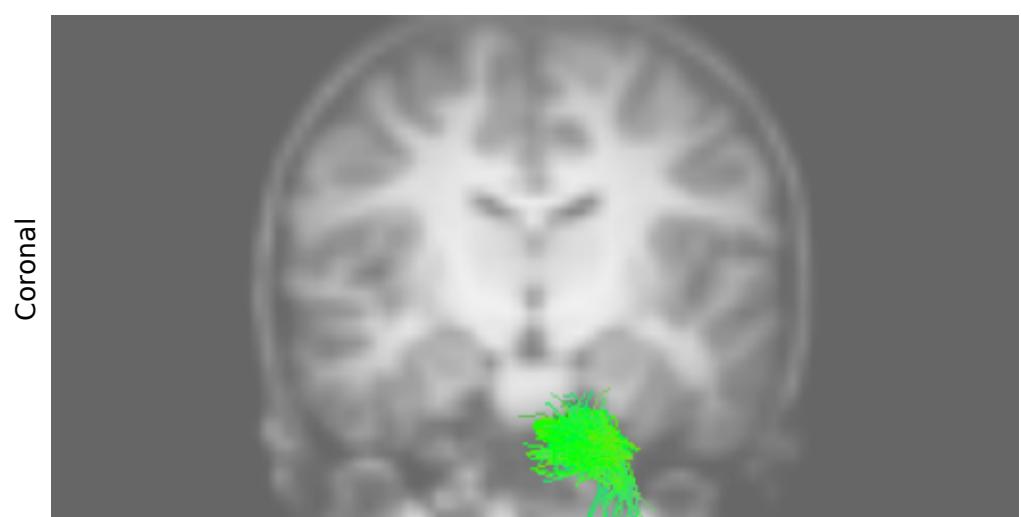
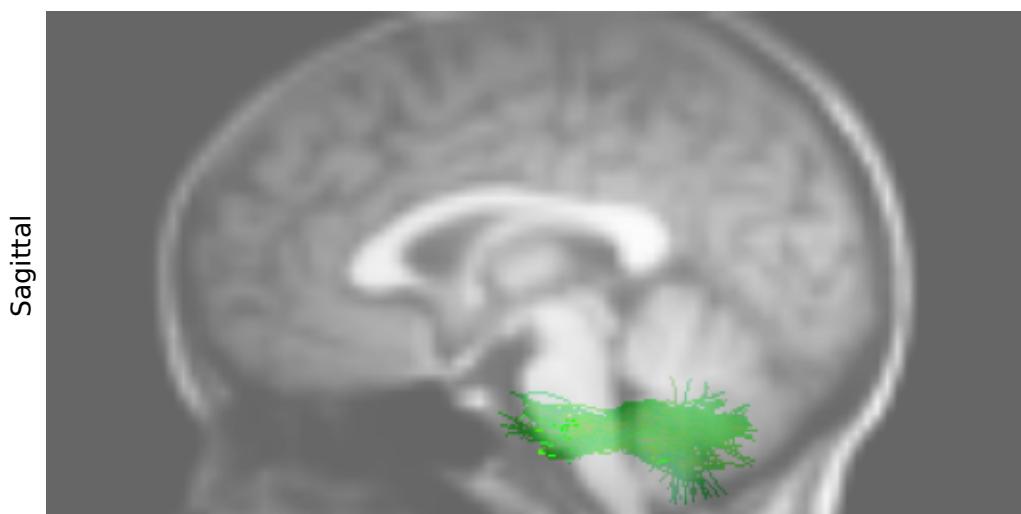
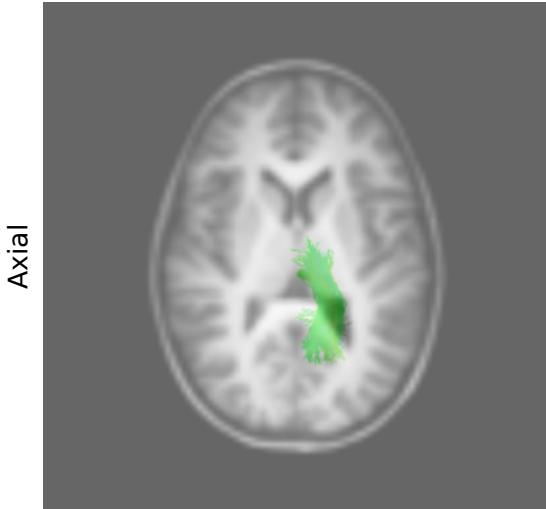
# Cranial/Vestibulocochlear/pure sensorial nerves - L (CNVIII\_L)



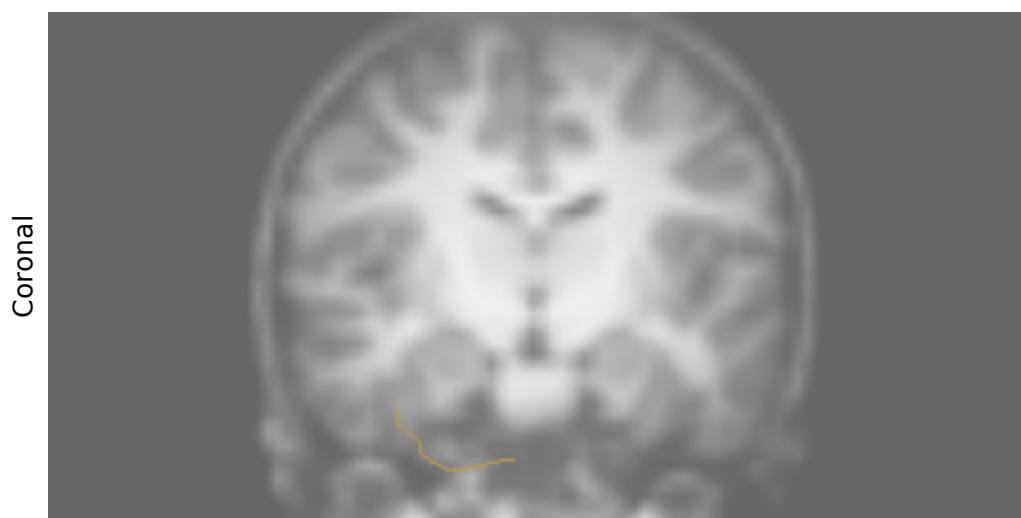
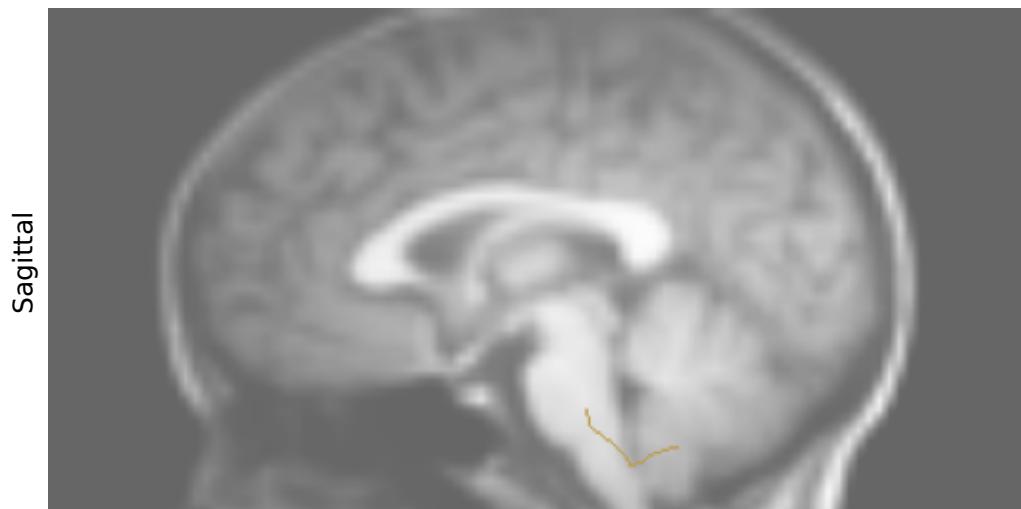
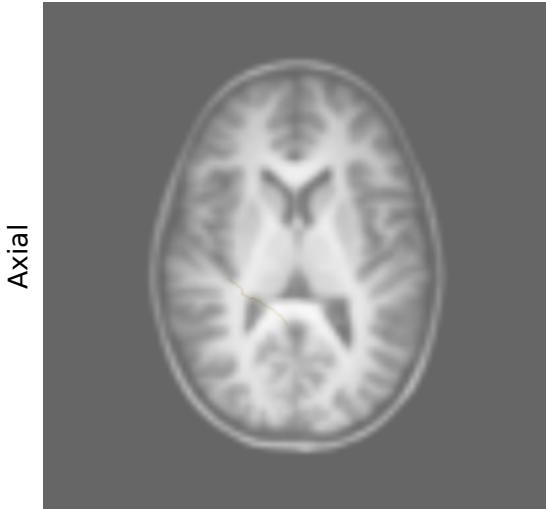
# Cranial/Vestibulocochlear/pure sensorial nerves - R (CNVIII\_R)



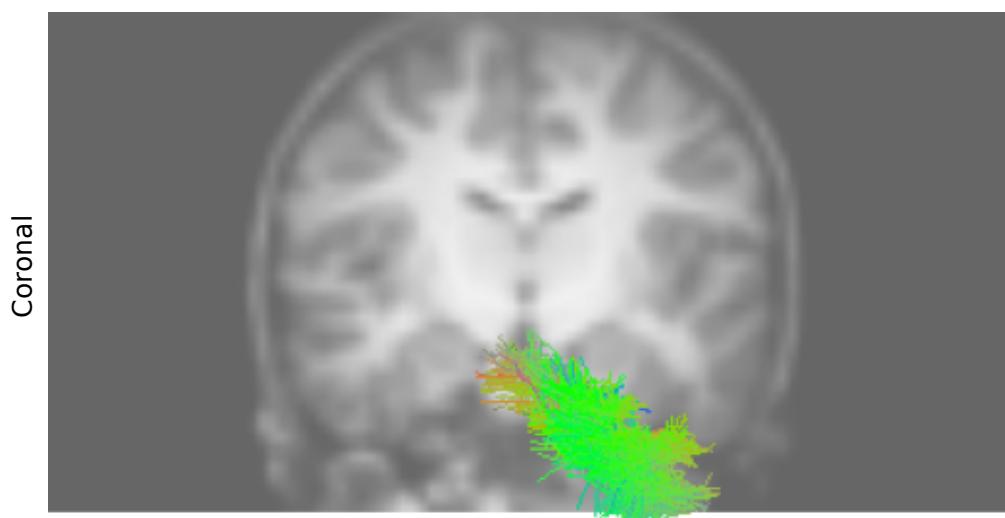
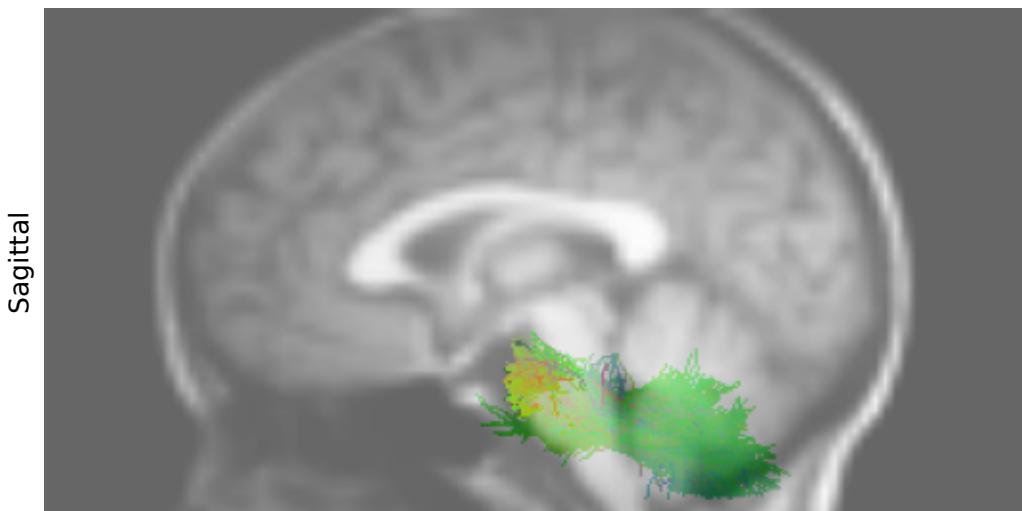
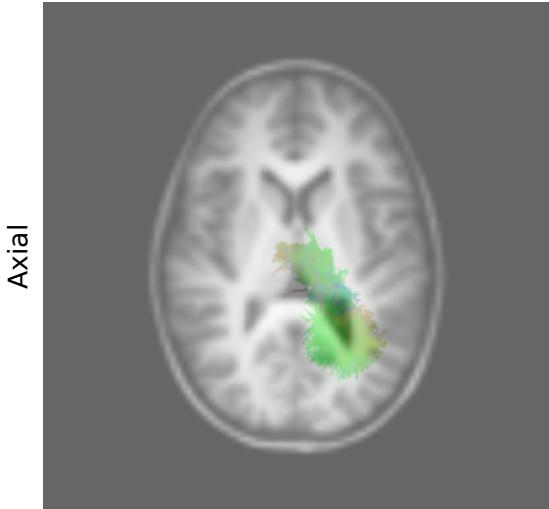
# Facial Nerve - L (CNVII\_L)



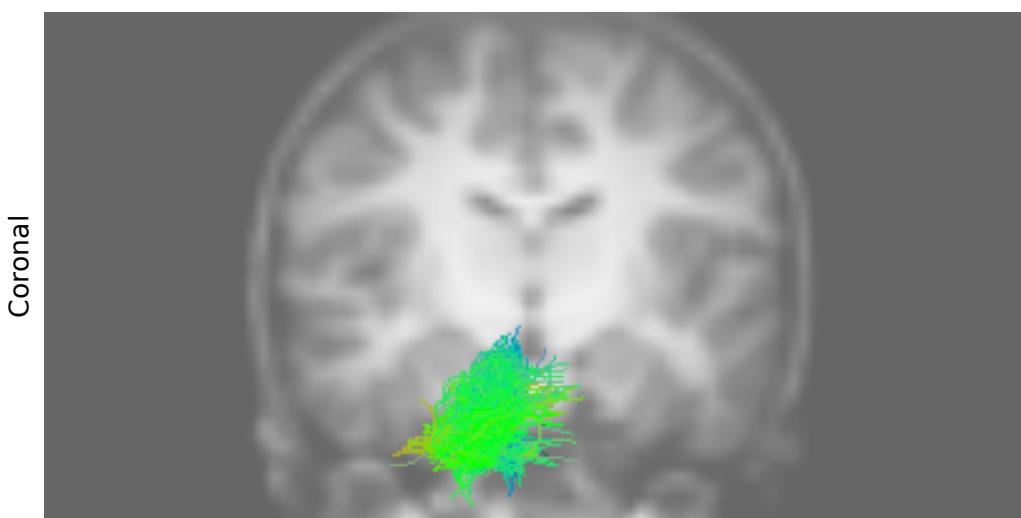
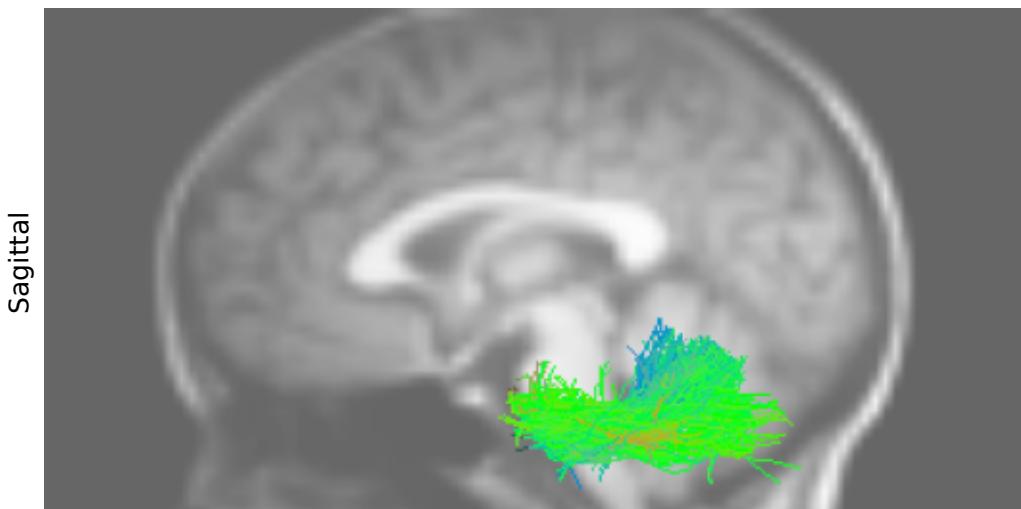
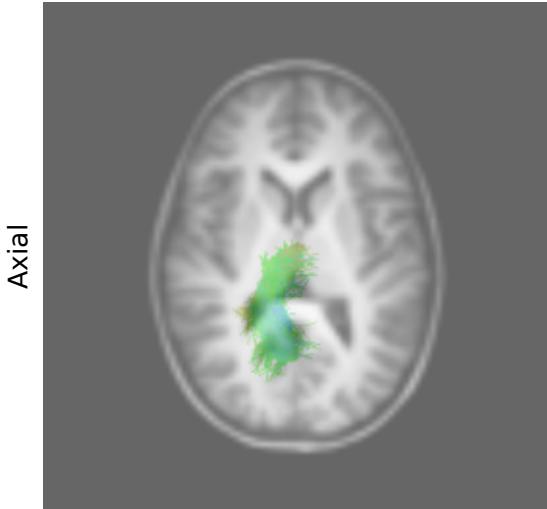
# Facial Nerve - R (CNVII\_R)



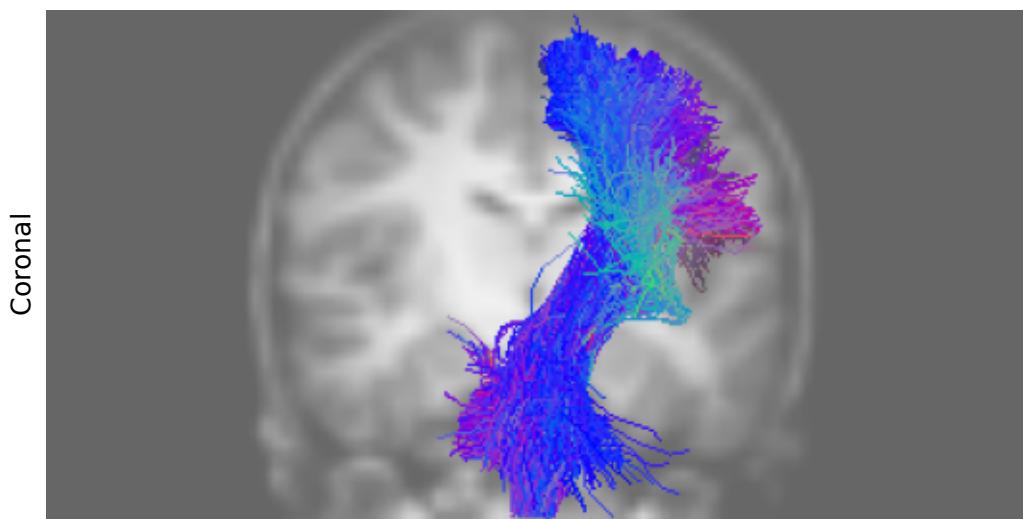
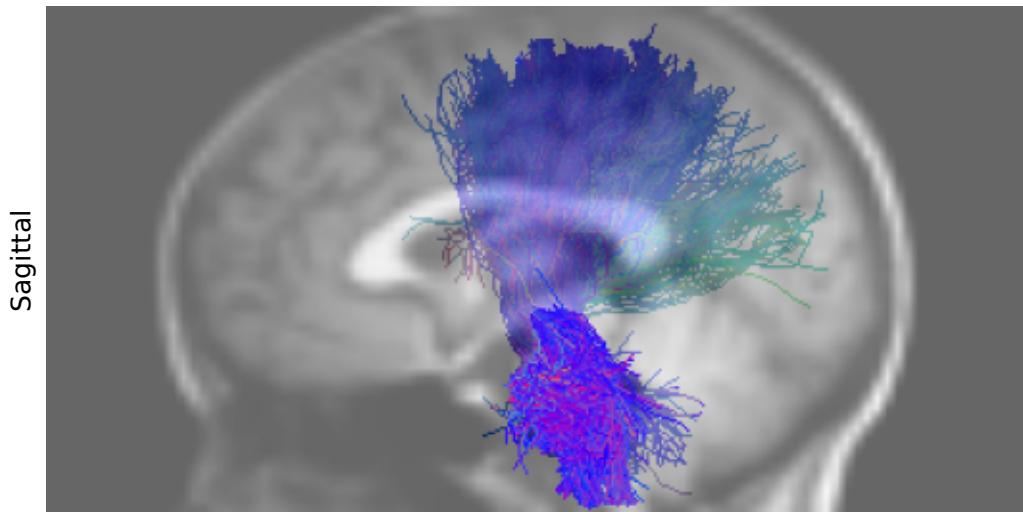
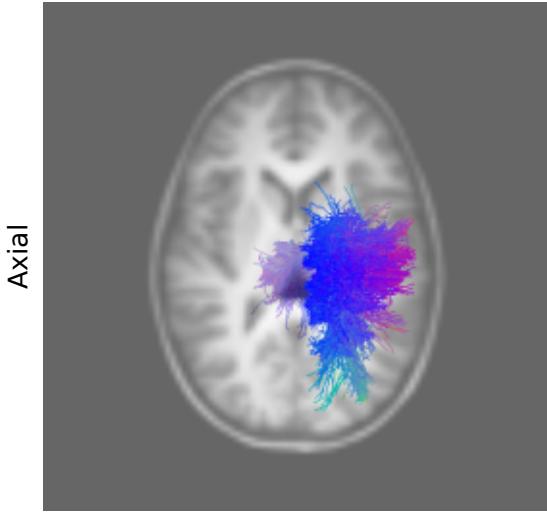
# Choroidal neovascularization - L (CNV\_L)



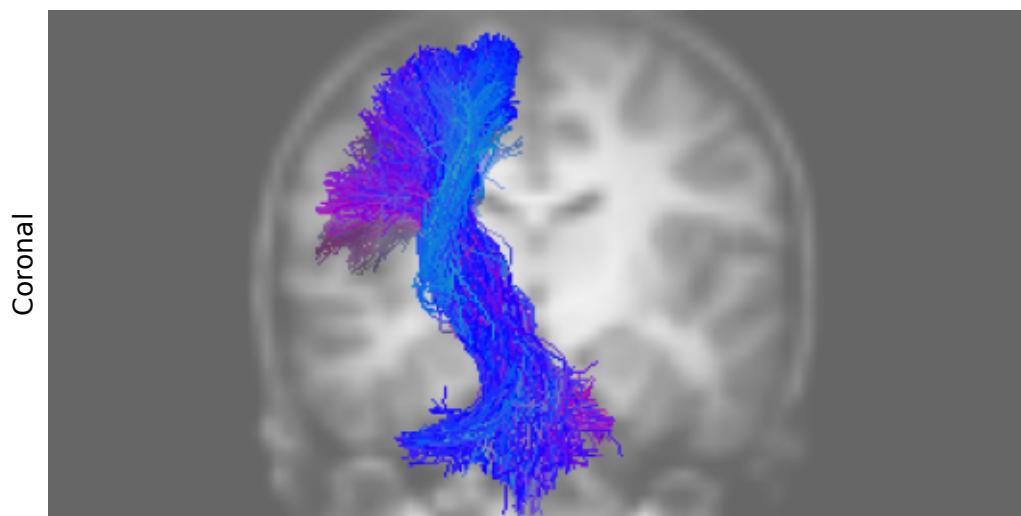
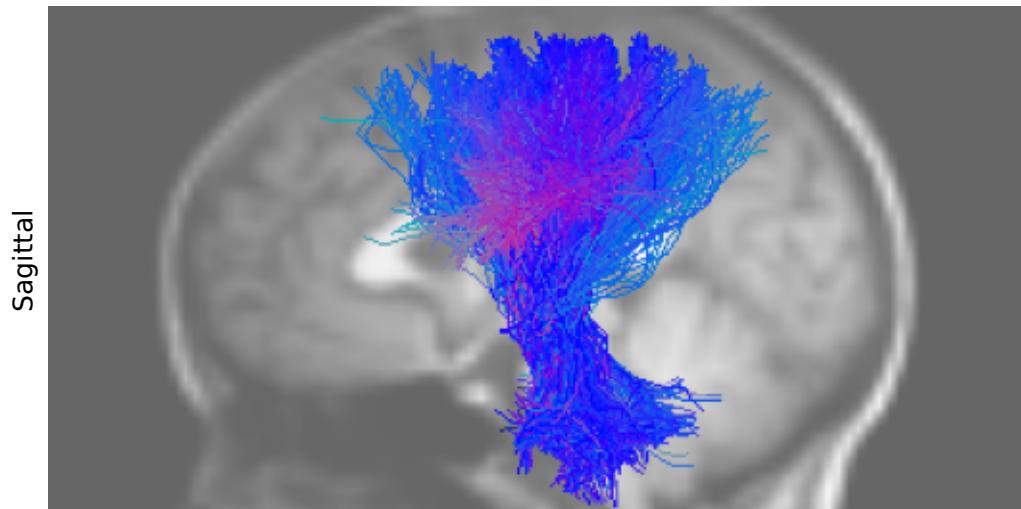
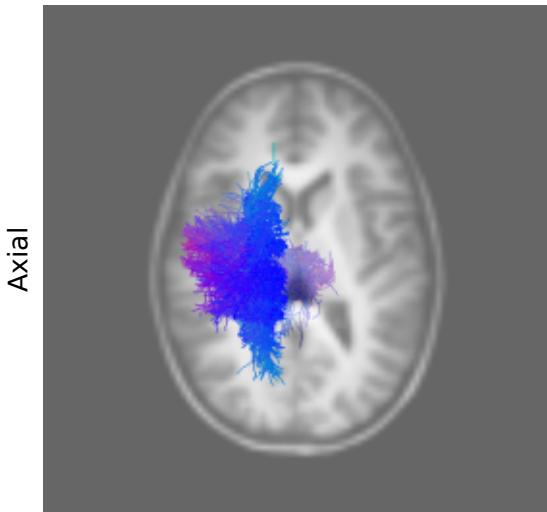
# Choroidal neovascularization - R (CNV\_R)



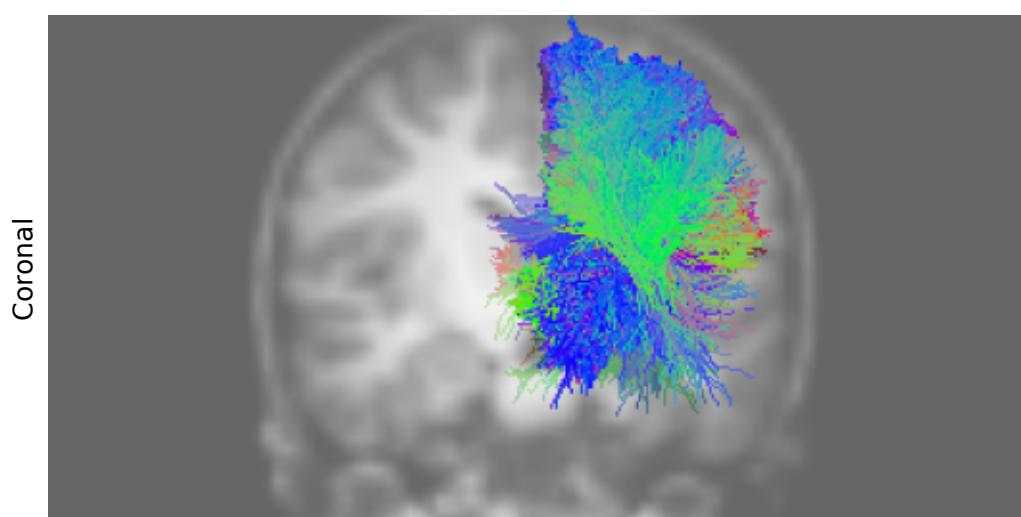
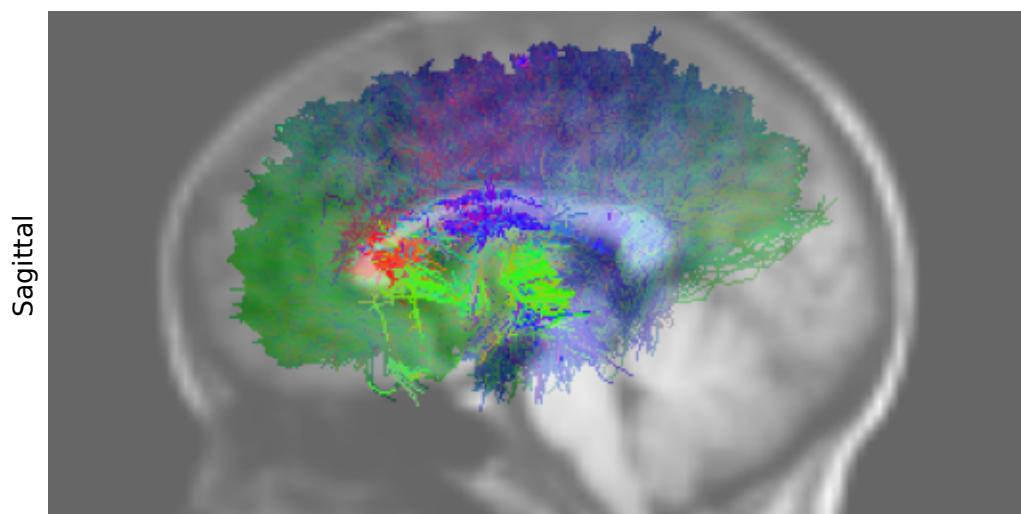
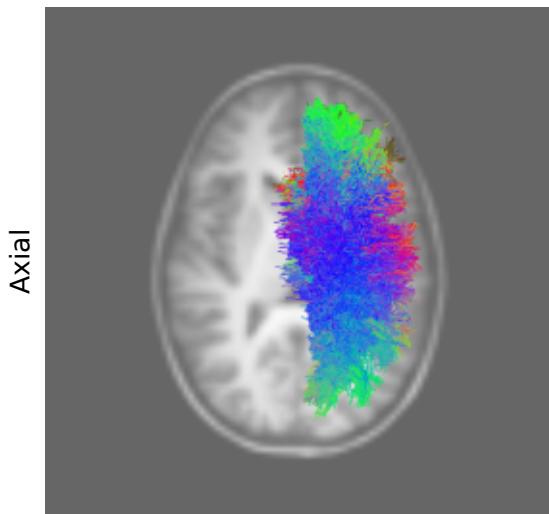
# Corticospinal Tract - L (CST\_L)



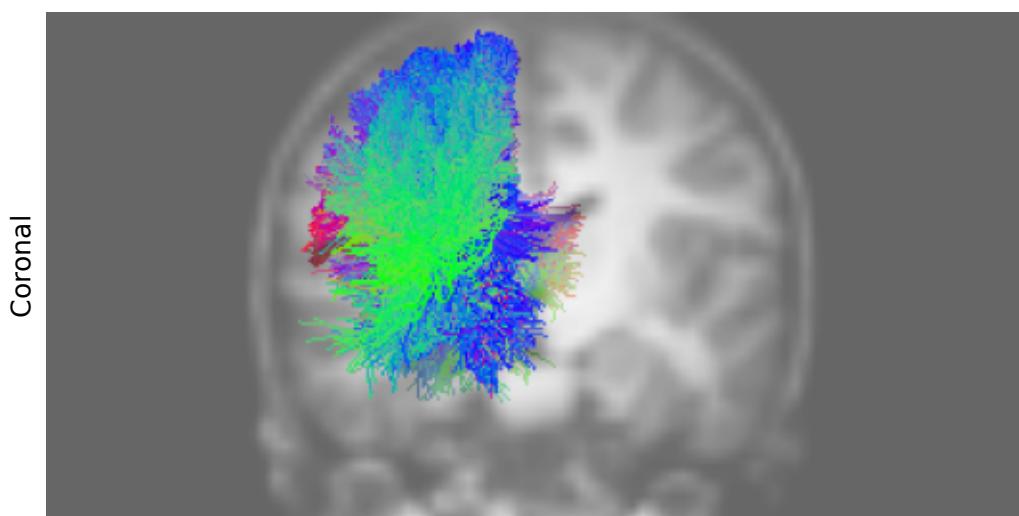
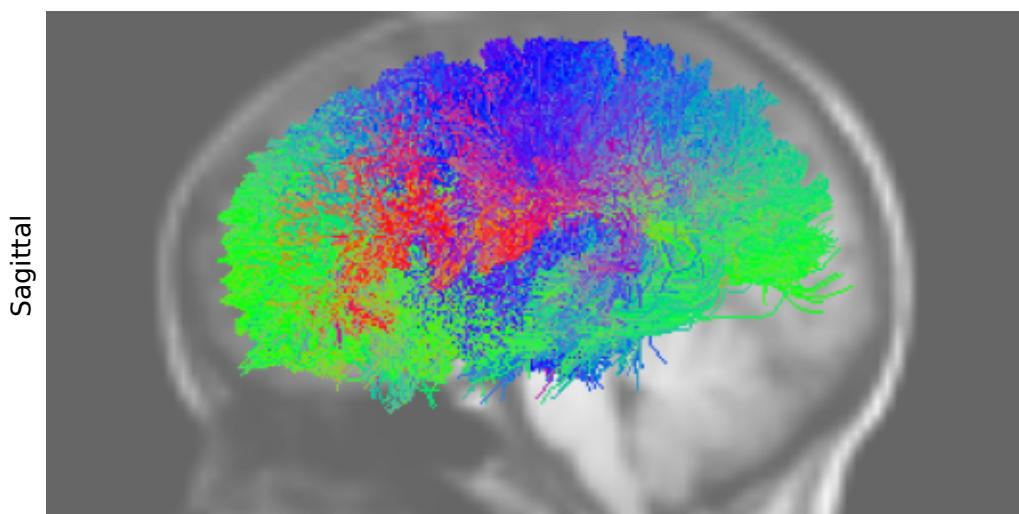
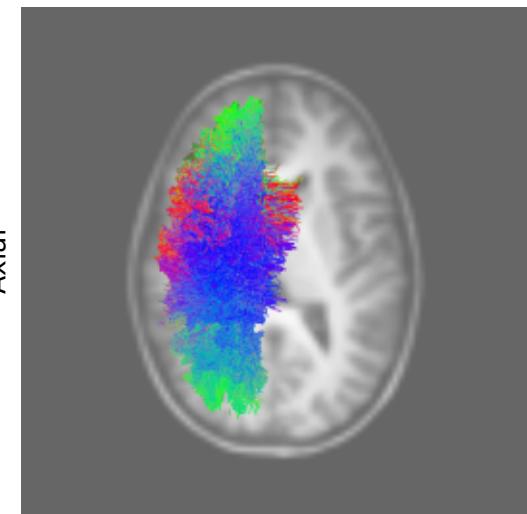
# Corticospinal Tract - R (CST\_R)



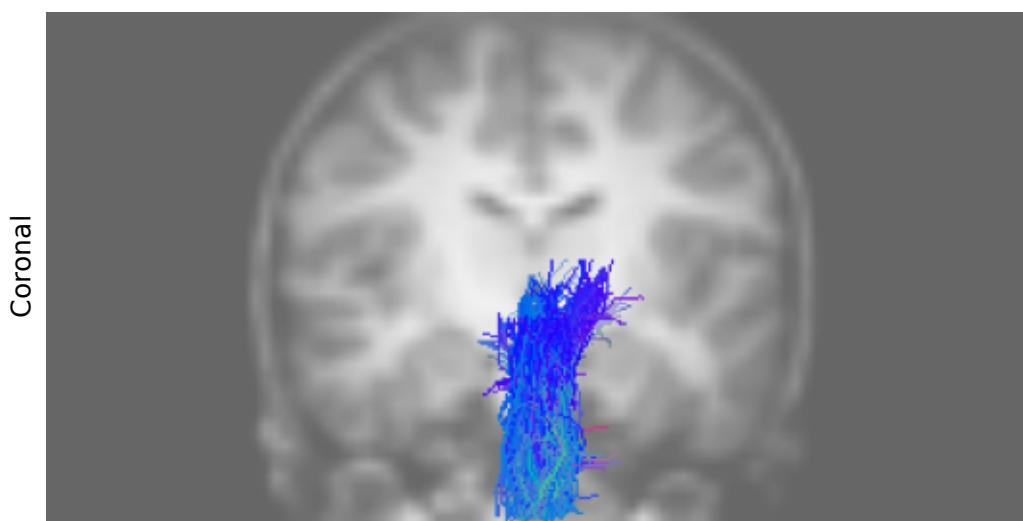
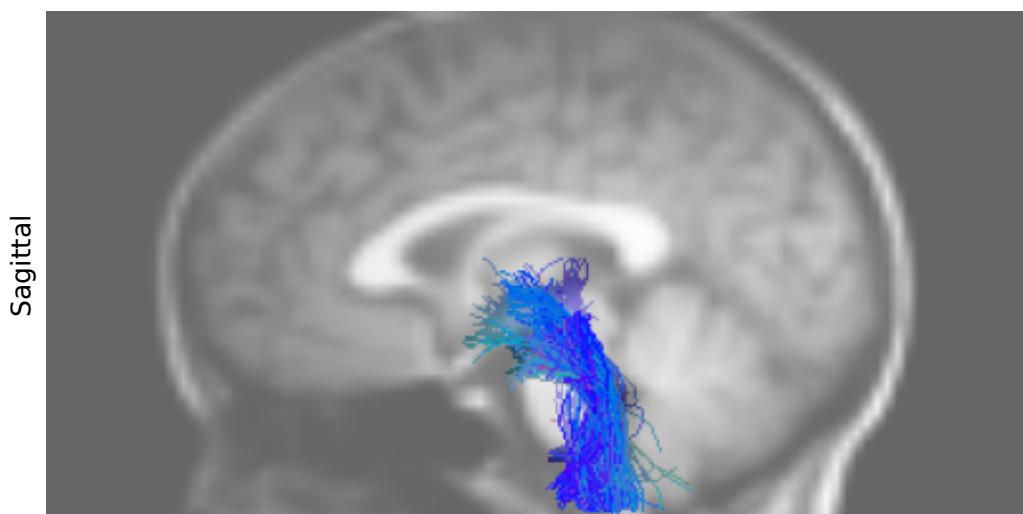
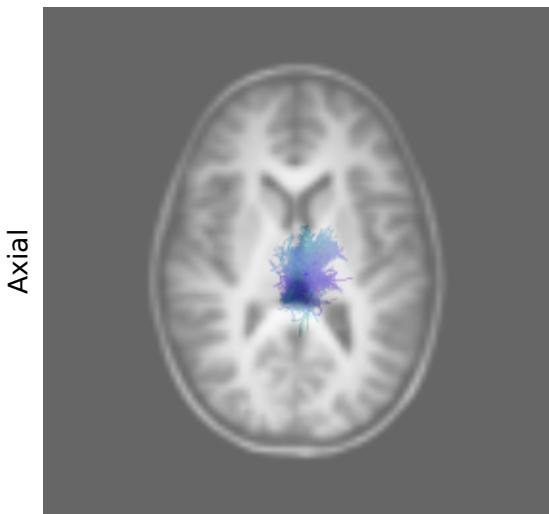
# Corticostriatal Pathway - L (CS\_L)



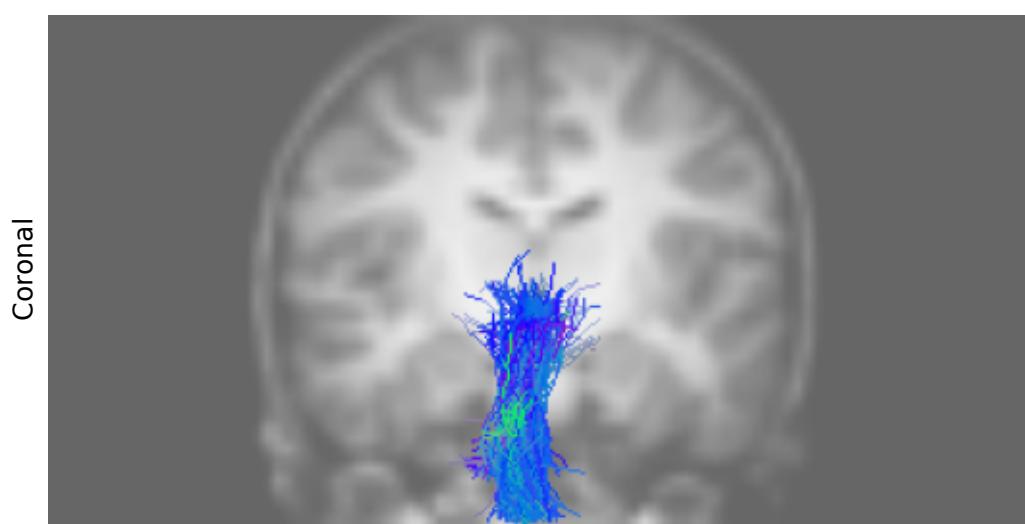
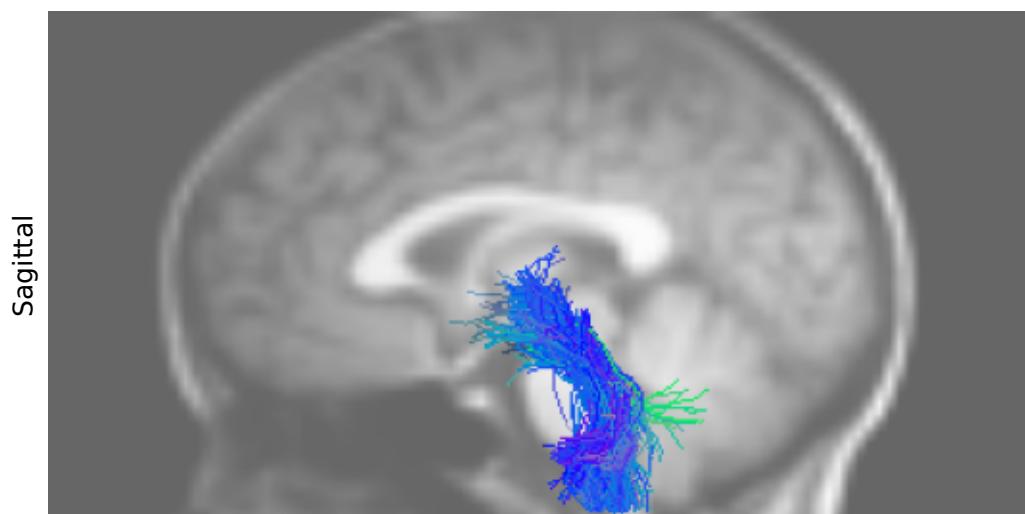
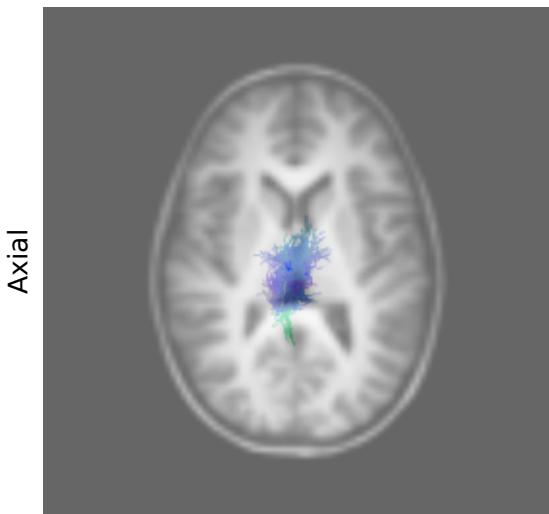
# Corticostriatal Pathway - R (CS\_R)



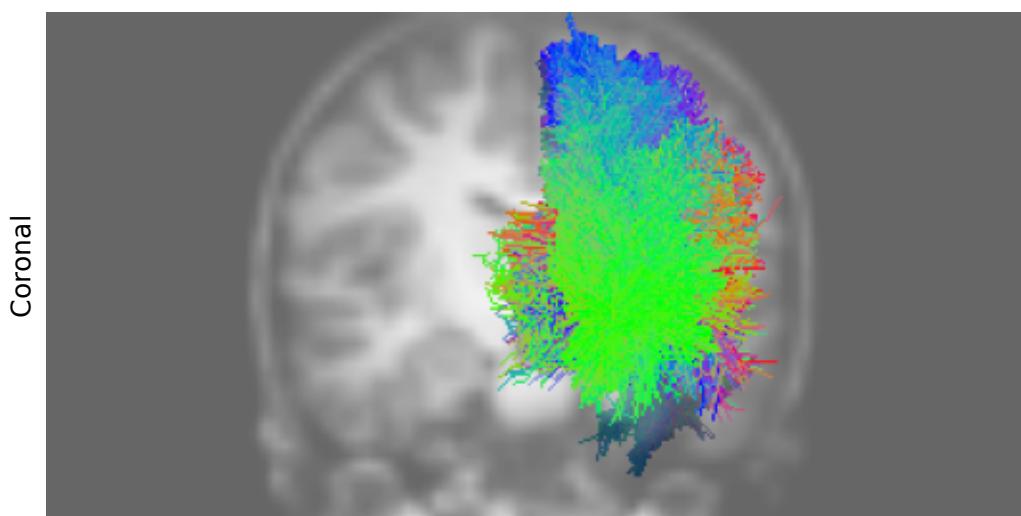
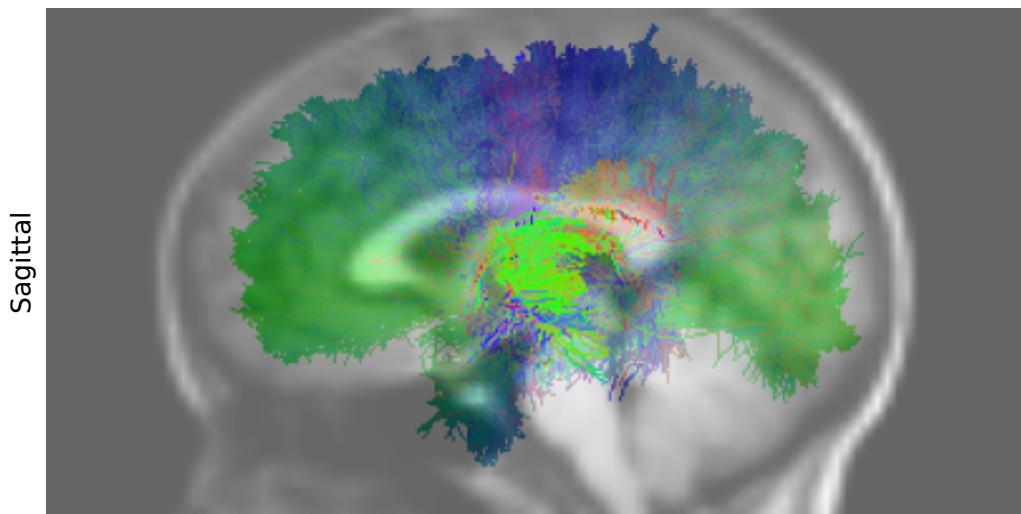
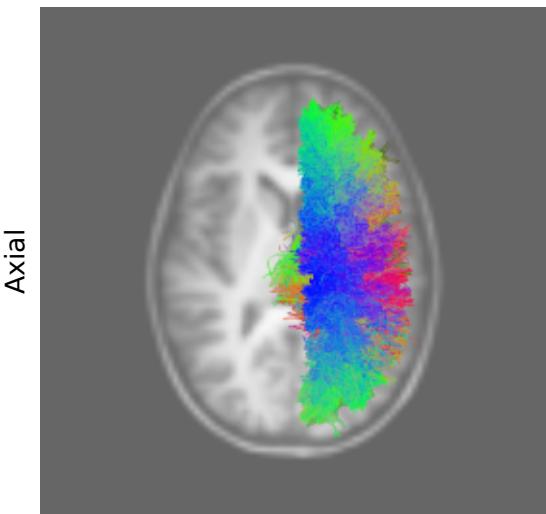
# Central Tegmental Tract - L (CTT\_L)



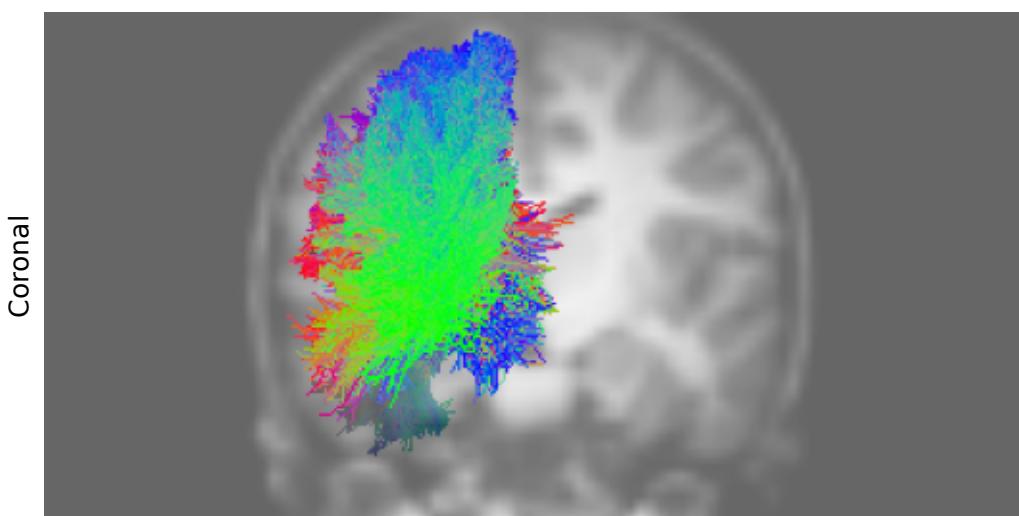
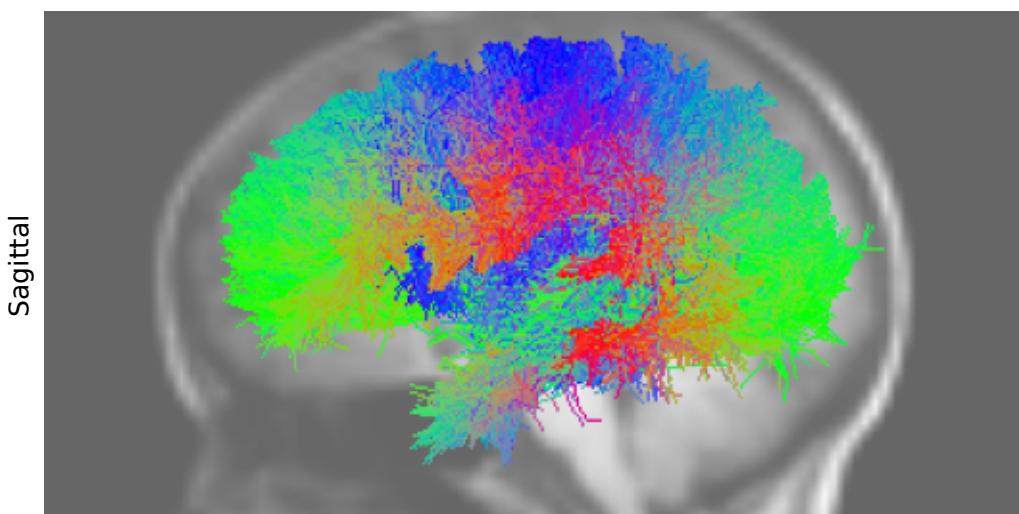
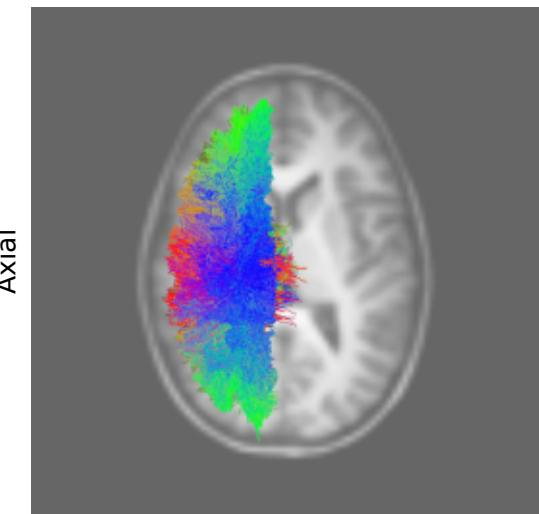
# Central Tegmental Tract - R (CTT\_R)



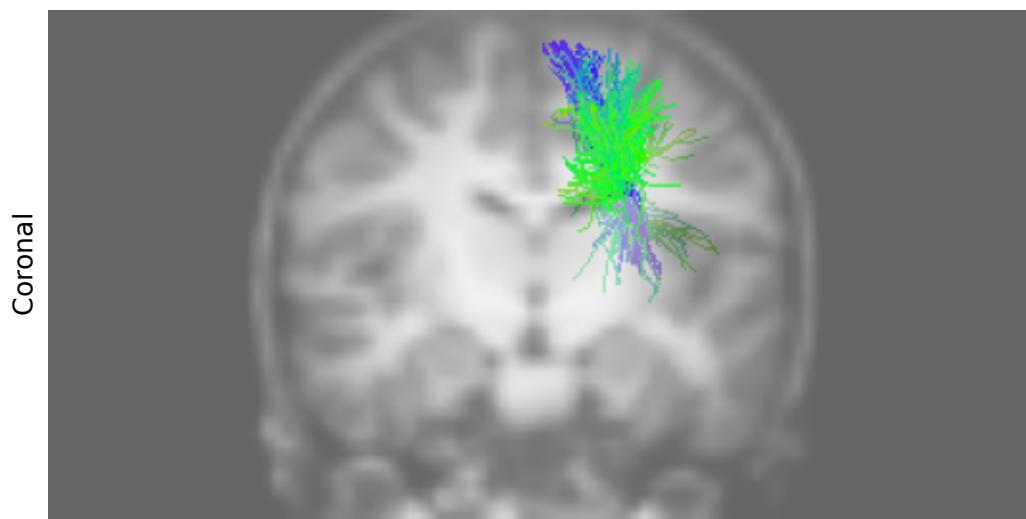
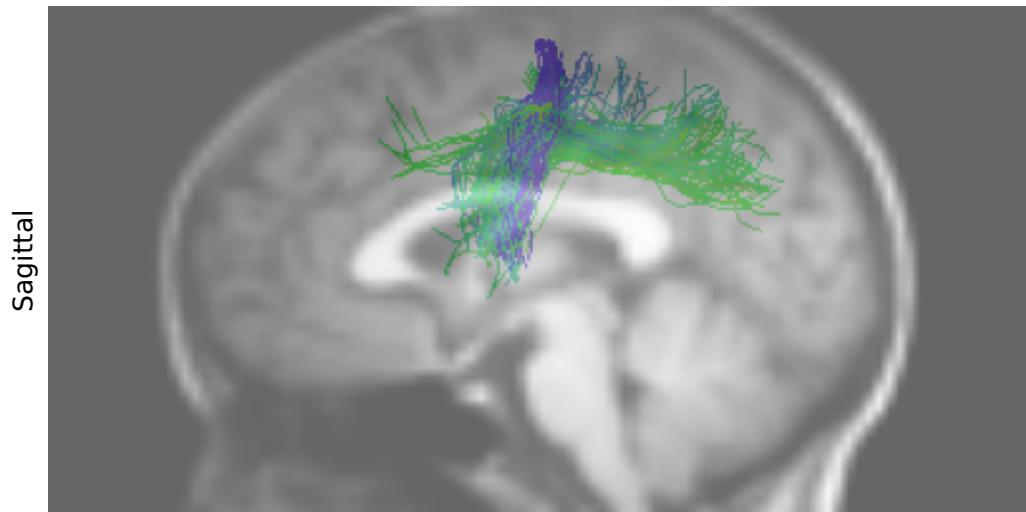
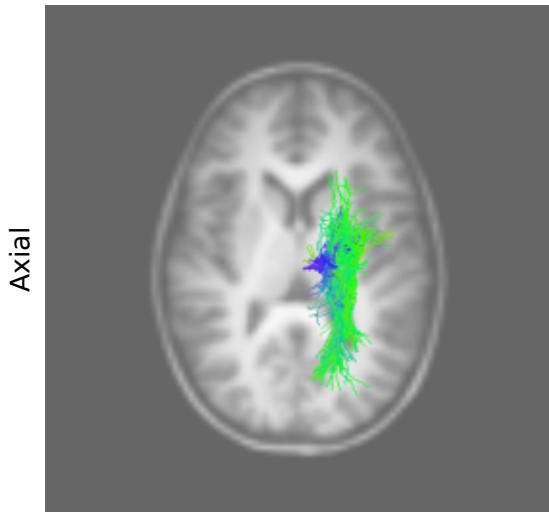
# Corticothalamic Pathway - L (CT\_L)



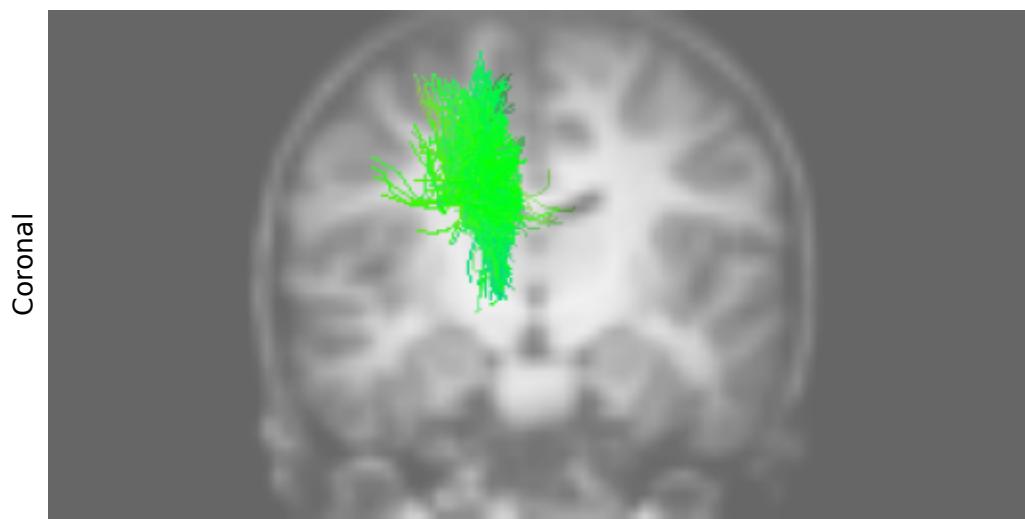
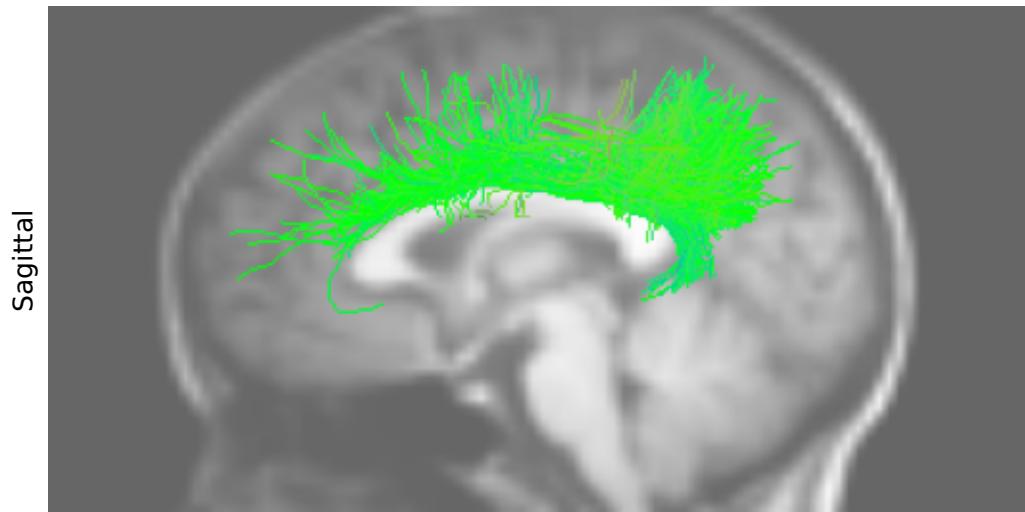
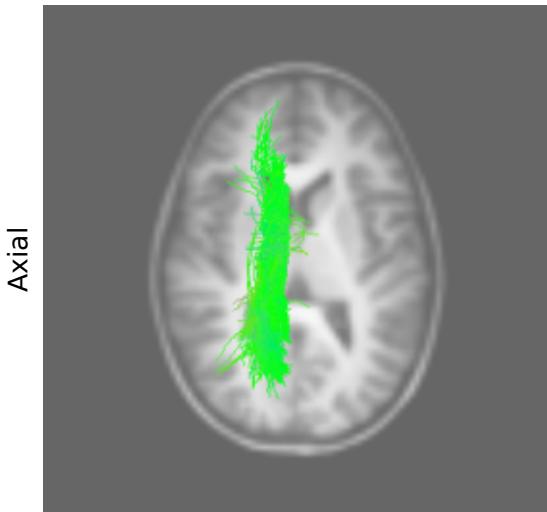
# Corticothalamic Pathway - R (CT\_R)



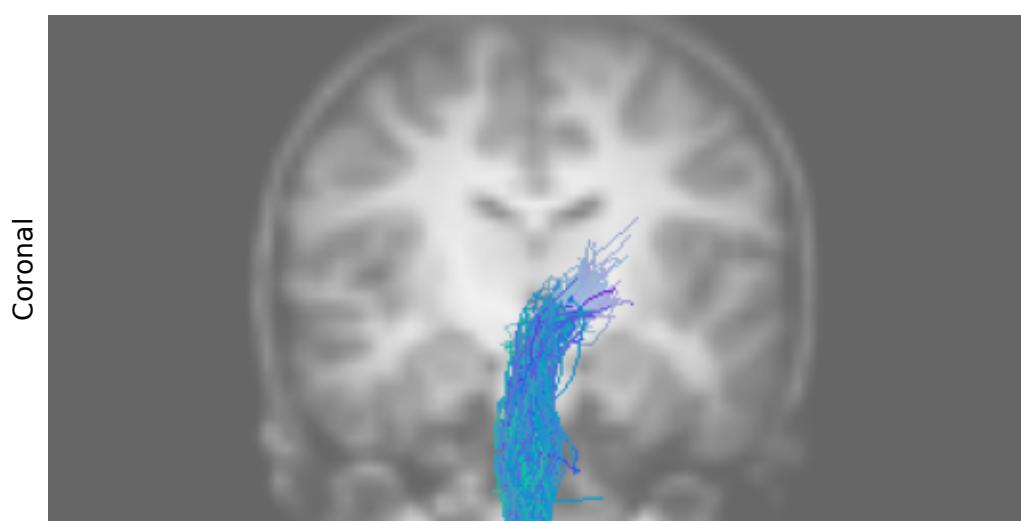
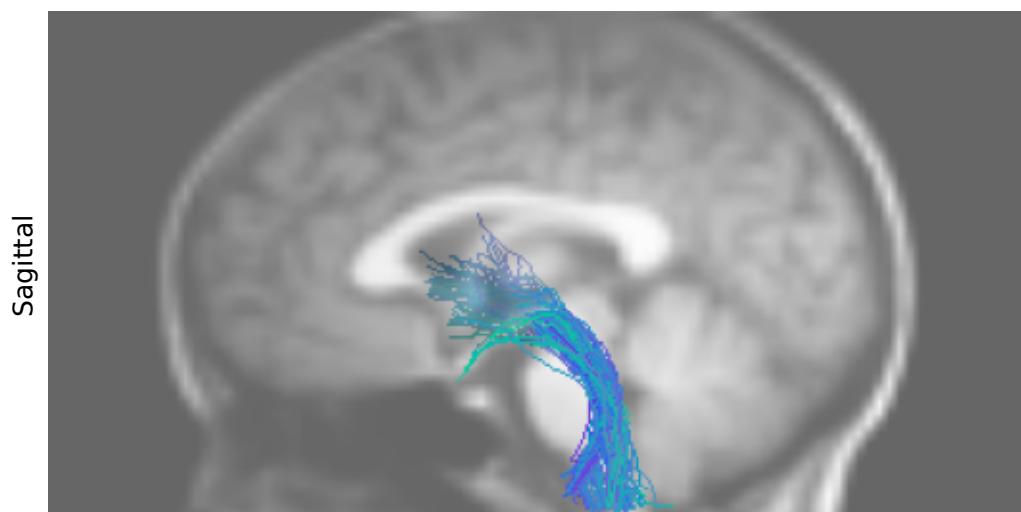
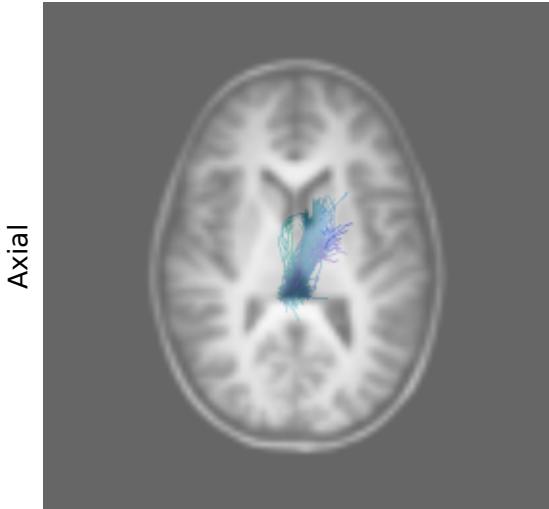
# Cingulum - L (C\_L)



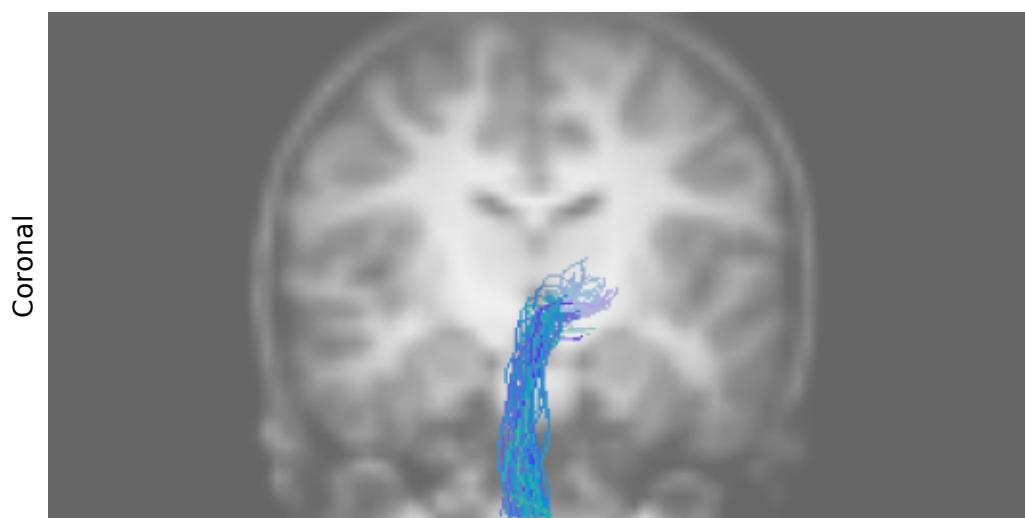
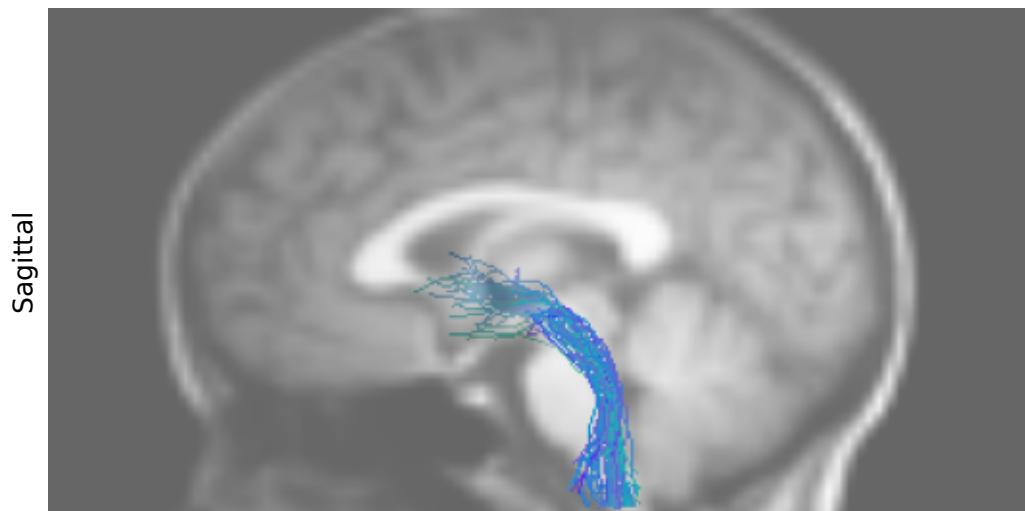
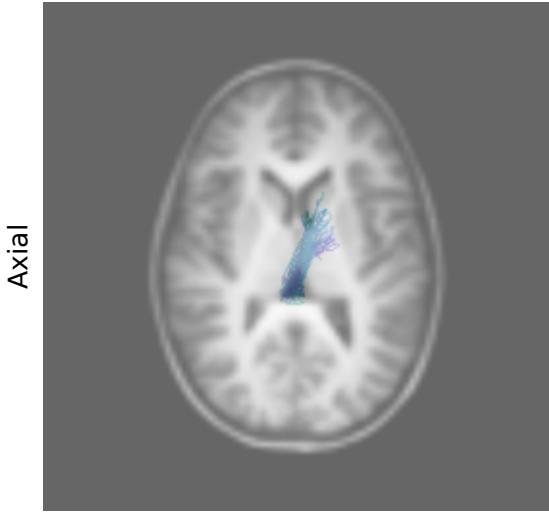
# Cingulum - R (C\_R)



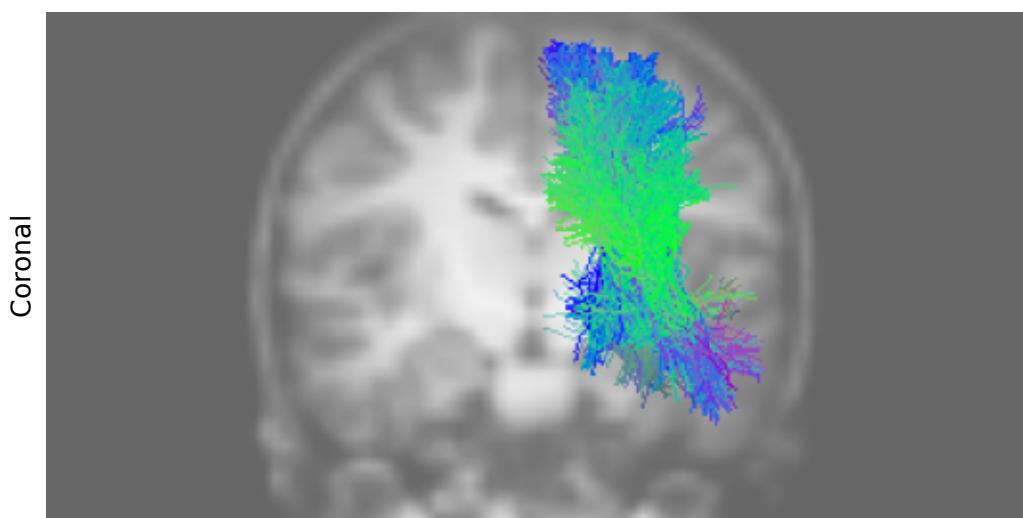
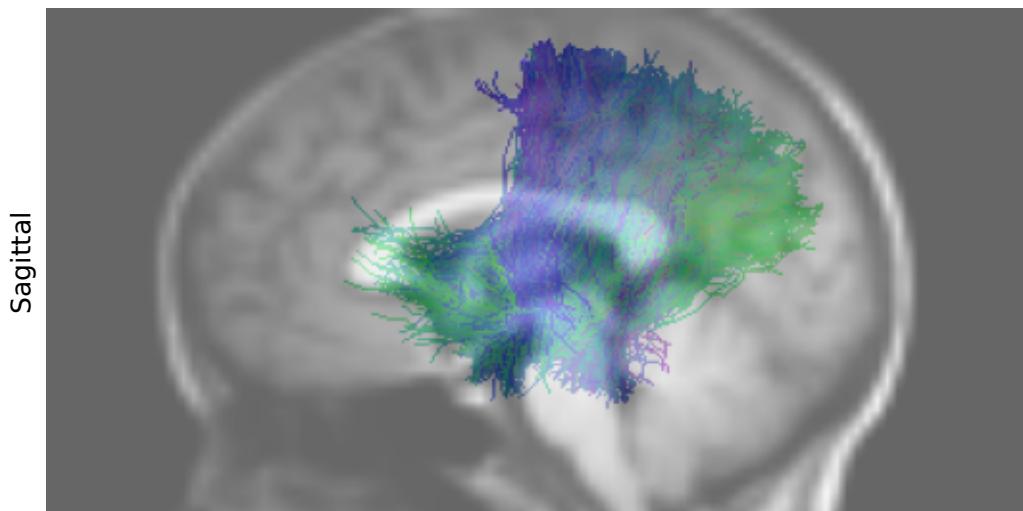
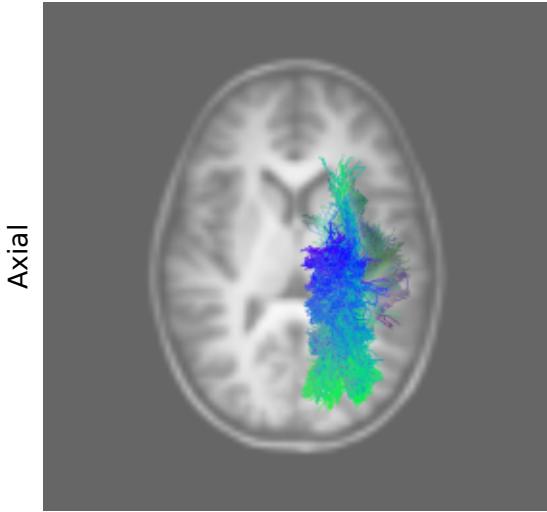
# Dorsal Longitudinal Fasciculus - L (DLF\_L)



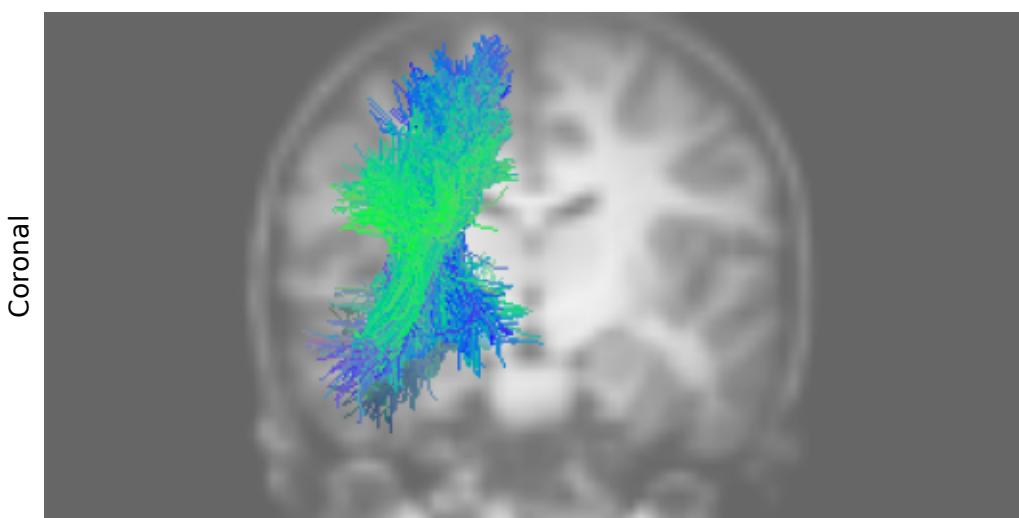
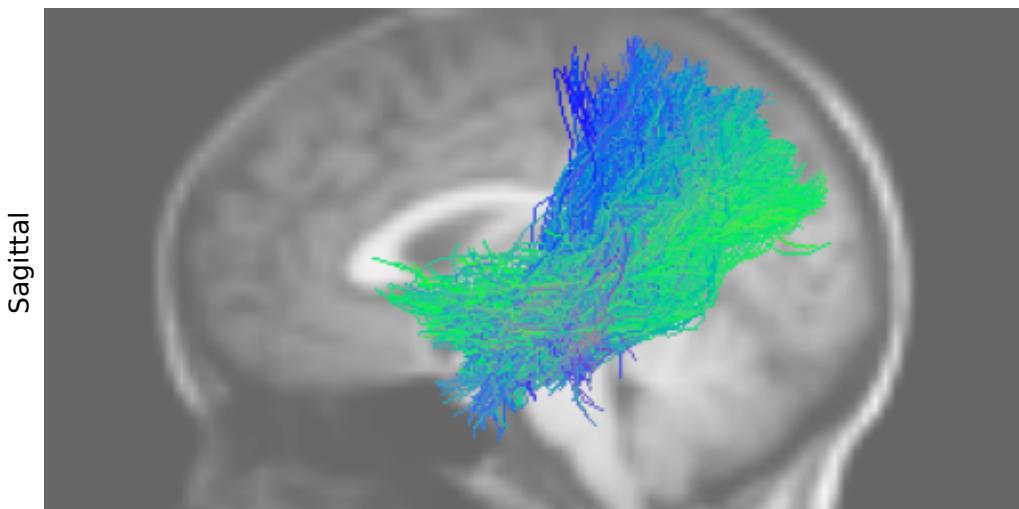
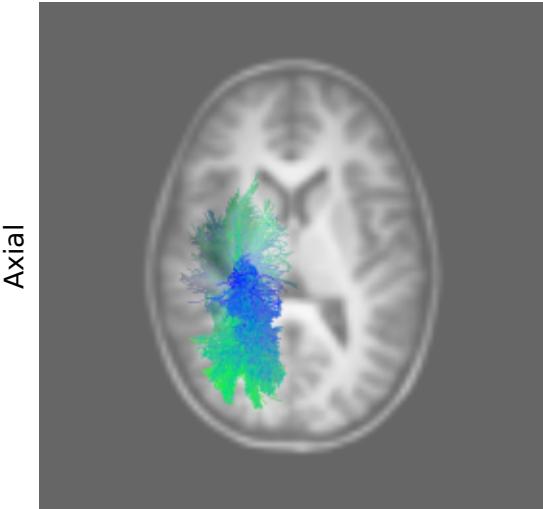
# Dorsal Longitudinal Fasciculus - R (DLF\_R)



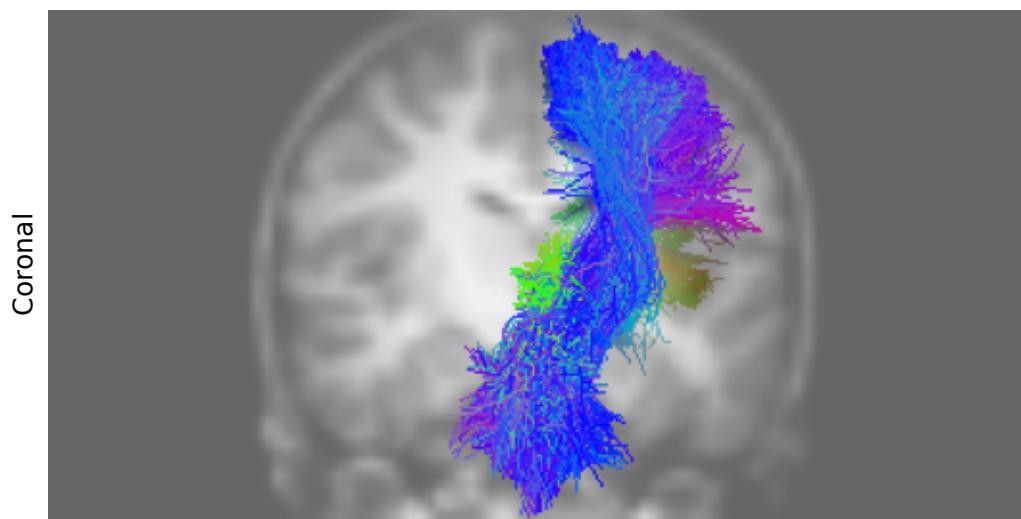
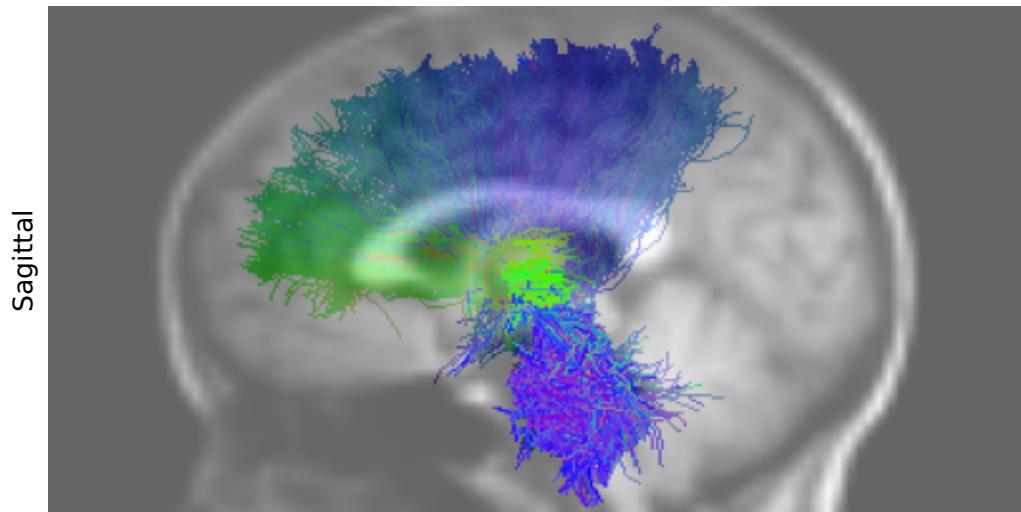
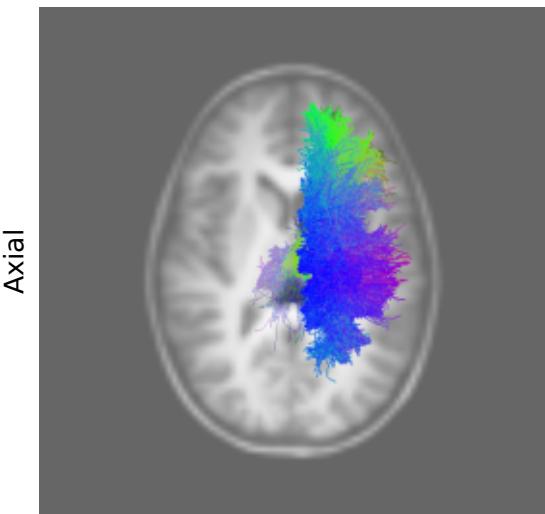
# Extreme Capsule - L (EMC\_L)



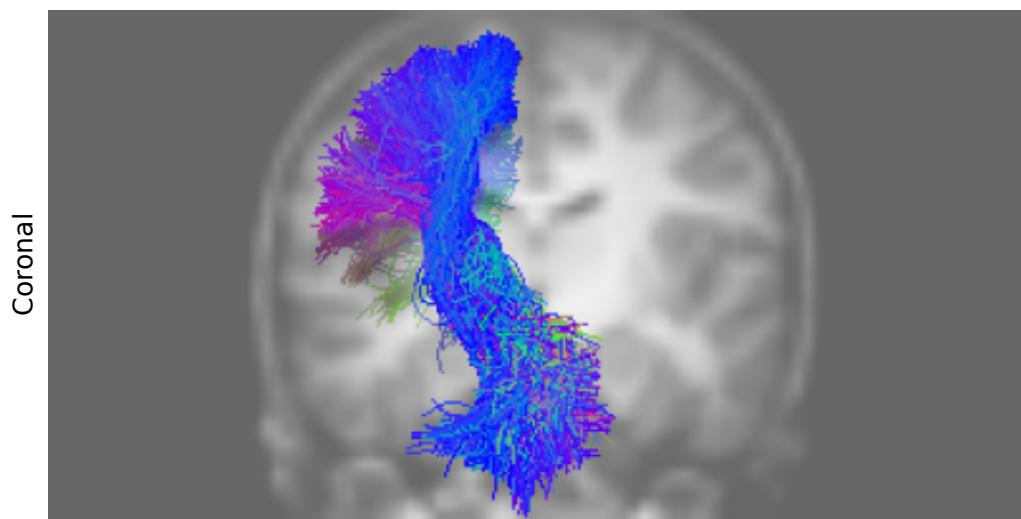
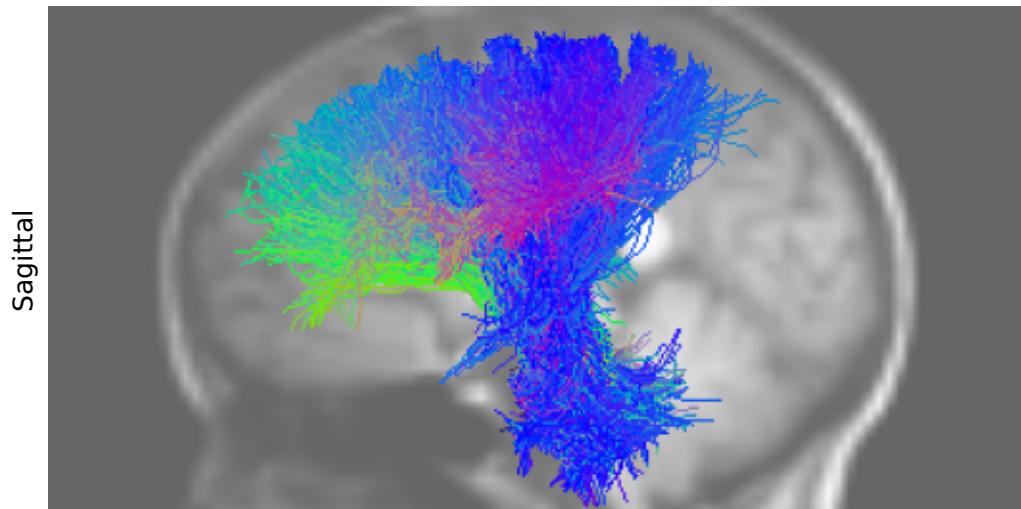
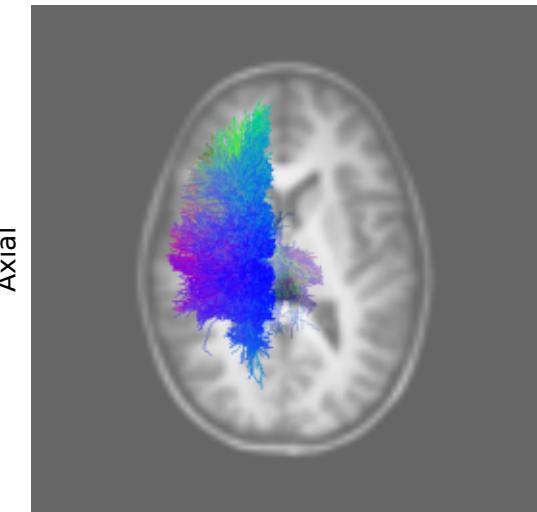
# Extreme Capsule - R (EMC\_R)



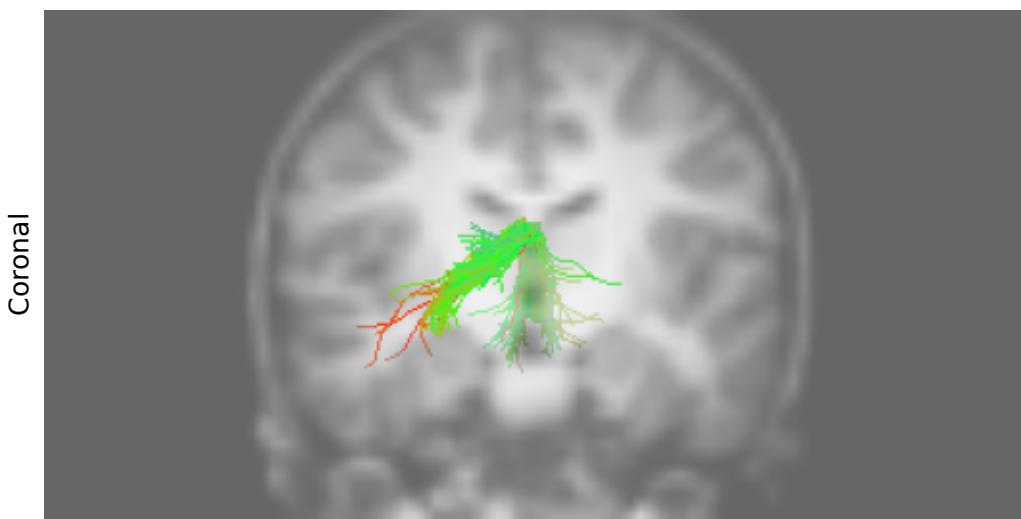
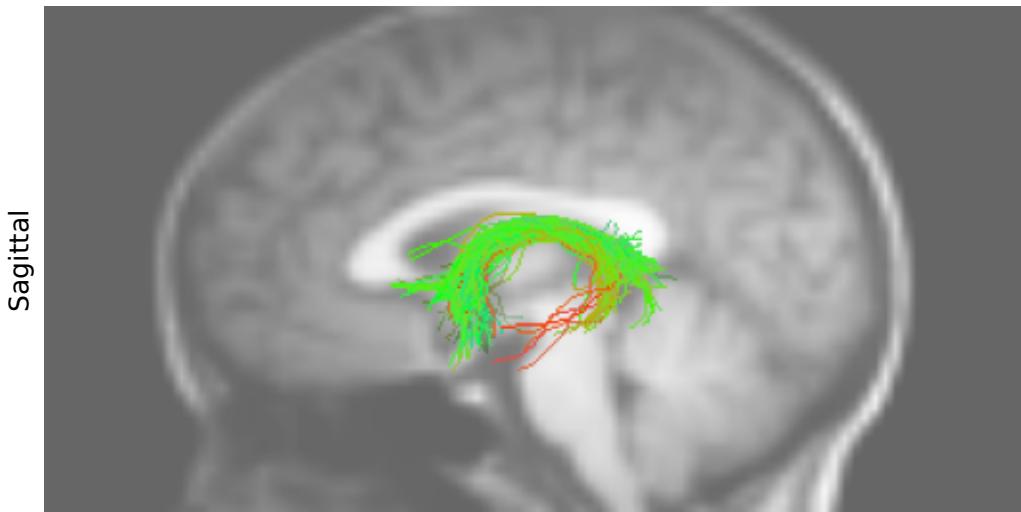
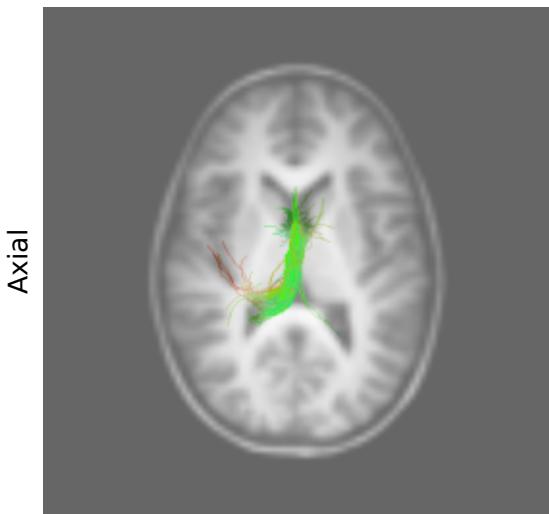
# Frontopontine Tract - L (FPT\_L)



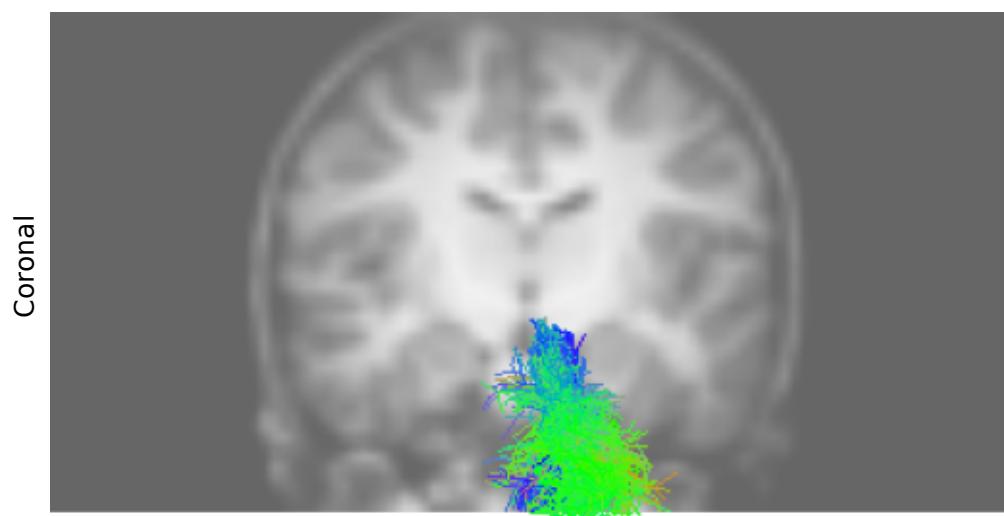
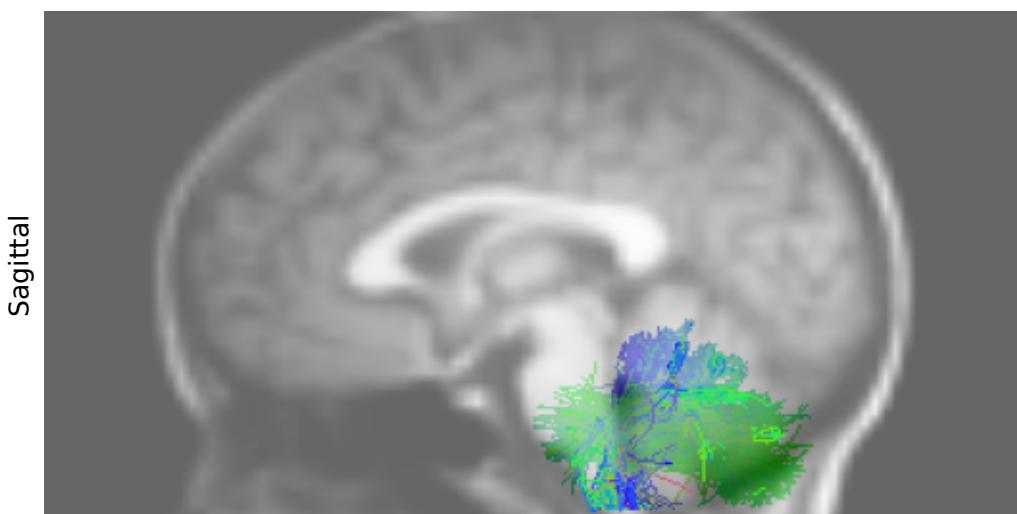
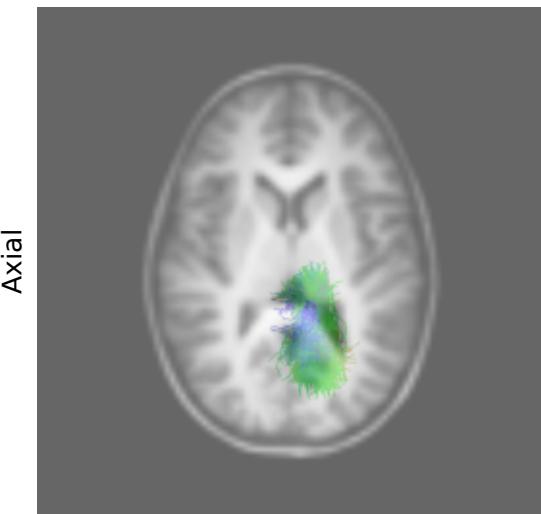
# Frontopontine Tract - R (FPT\_R)



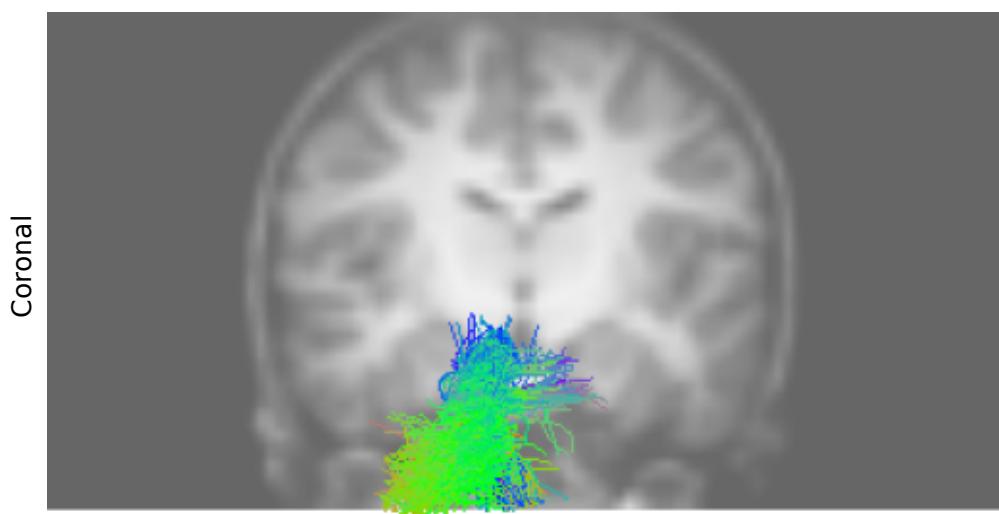
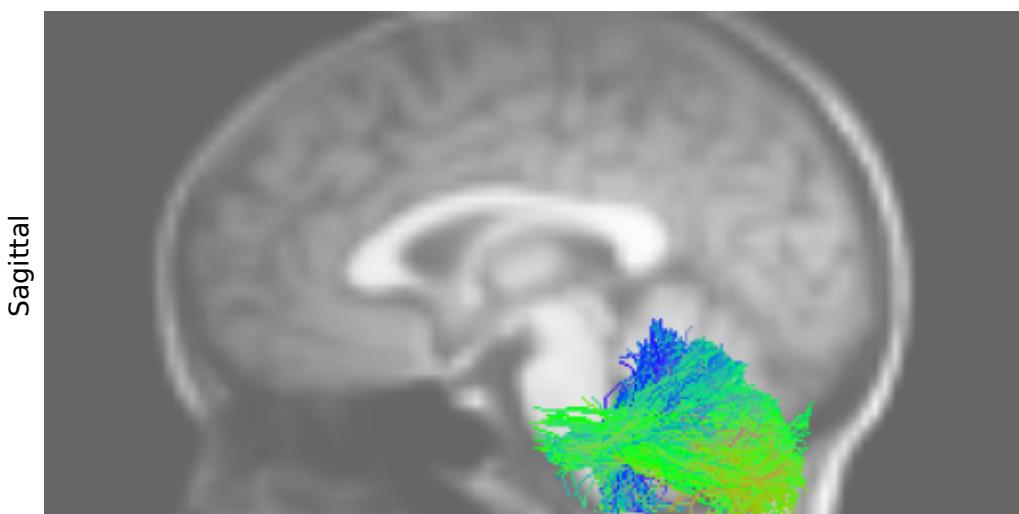
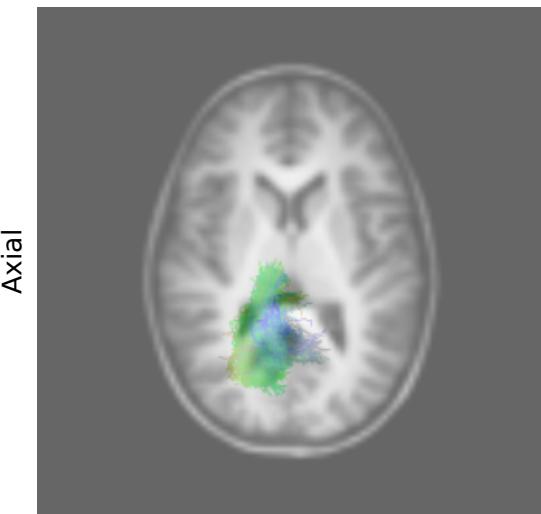
# Fornix Left and Right merged (F\_L\_R)



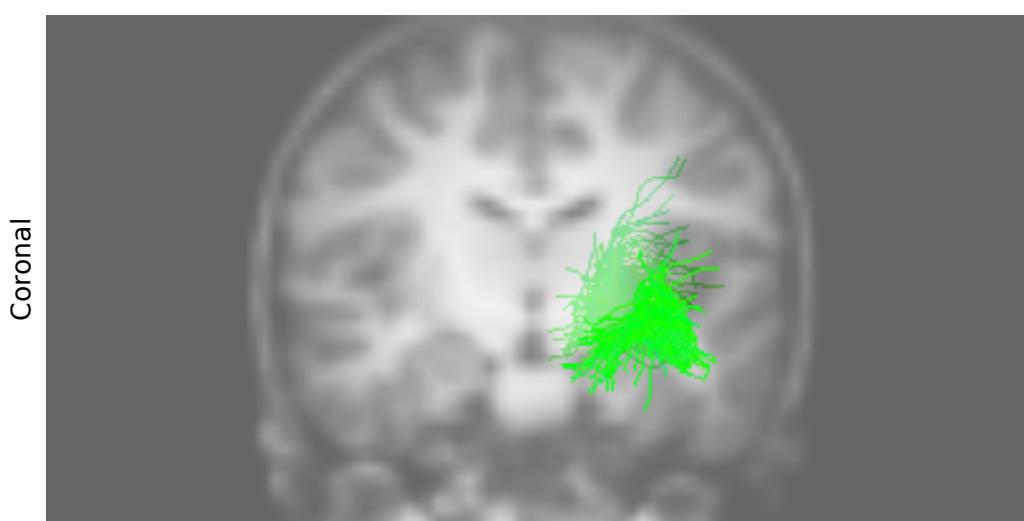
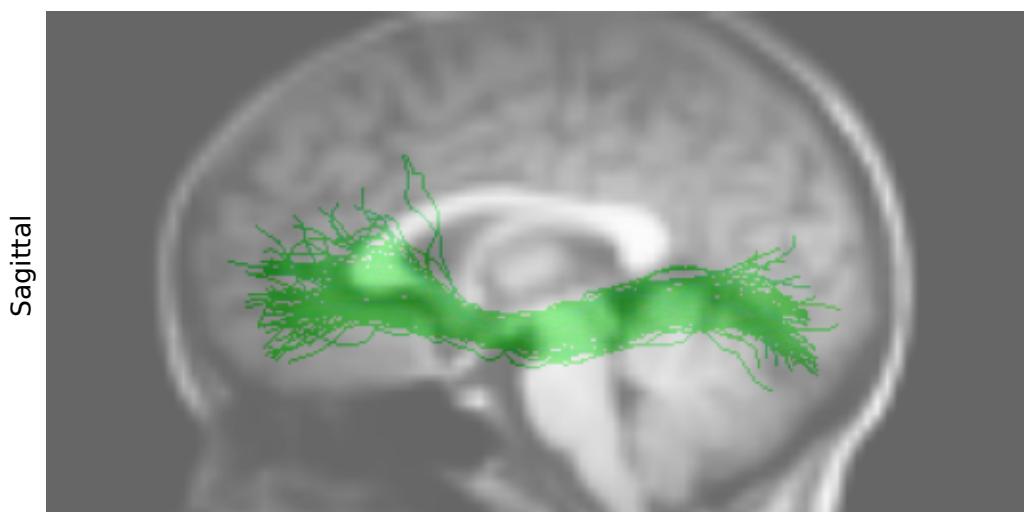
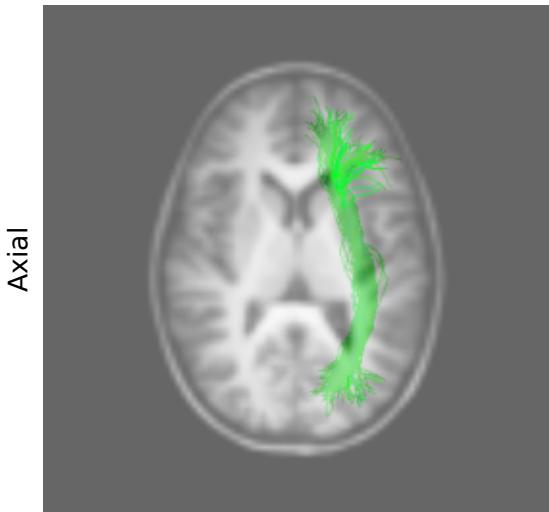
# Inferior Cerebellar Peduncle - L (ICP\_L)



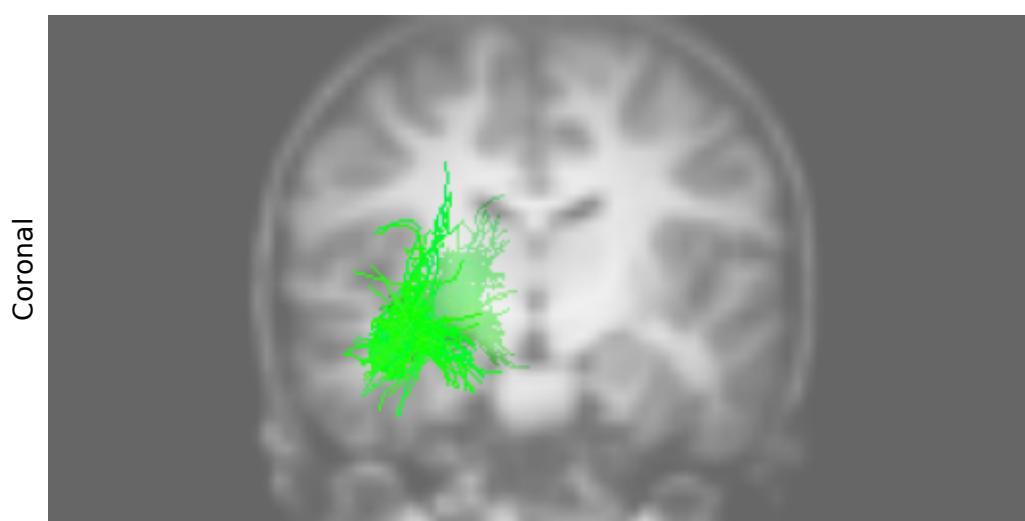
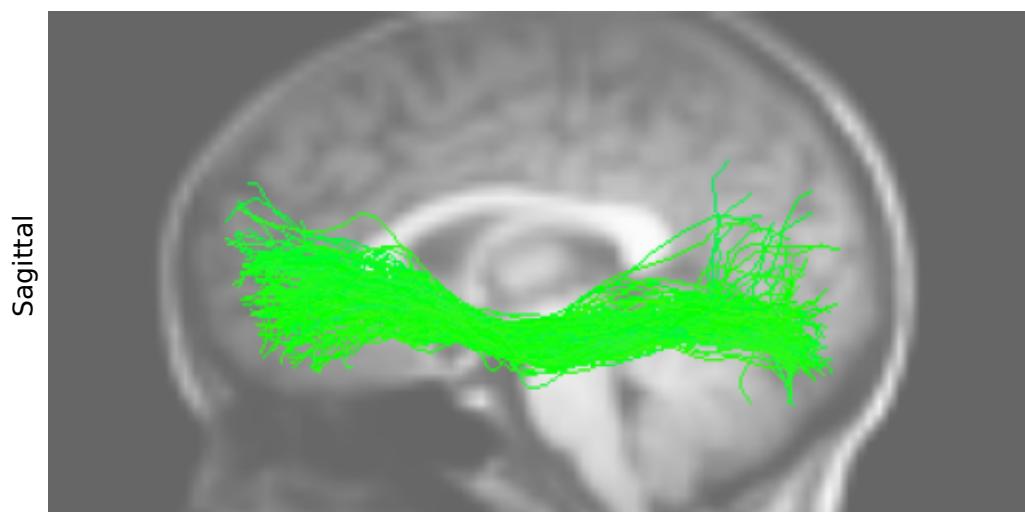
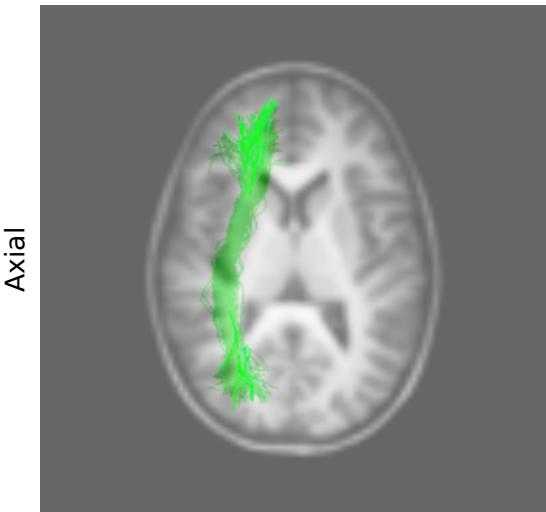
# Inferior Cerebellar Peduncle - R (ICP\_R)



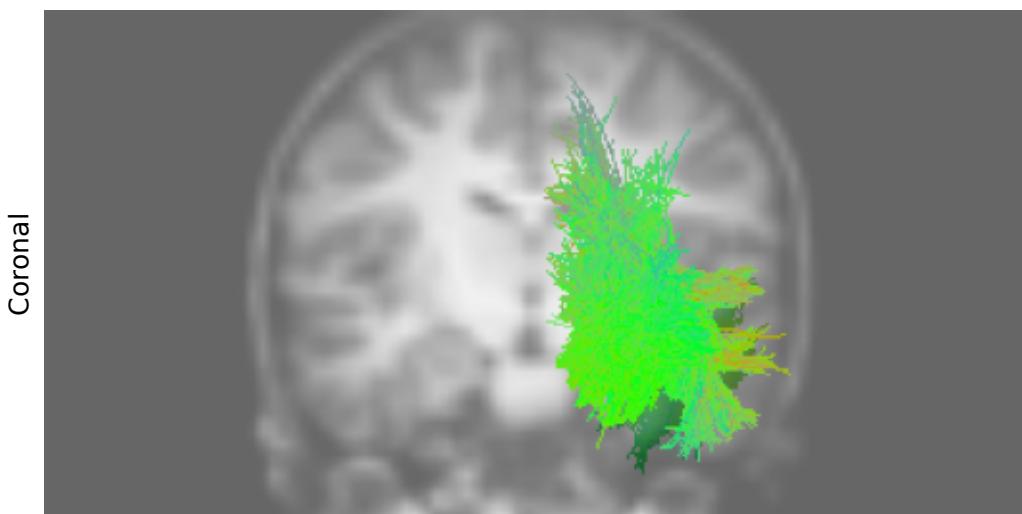
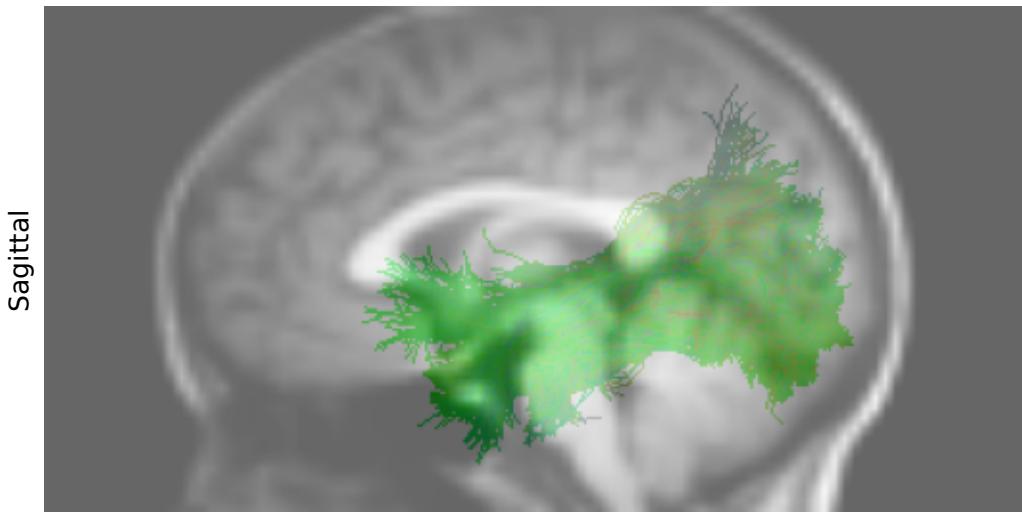
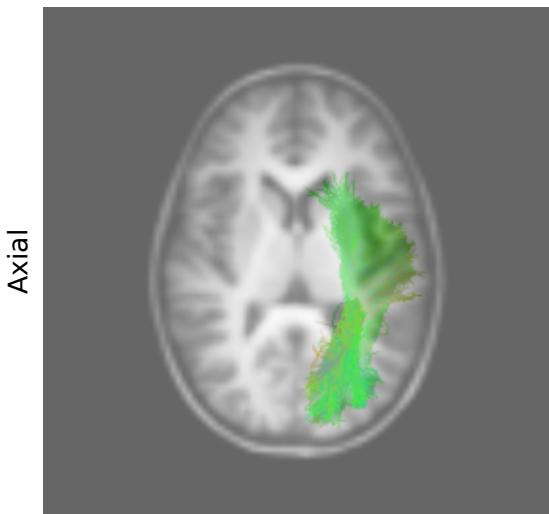
# Inferior Fronto-occipital Fasciculus - L (IFOF\_L)



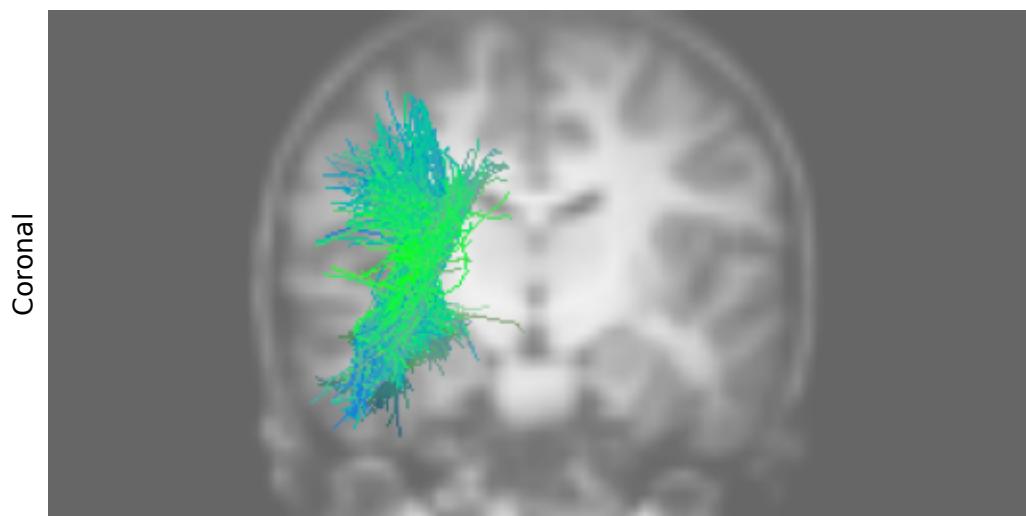
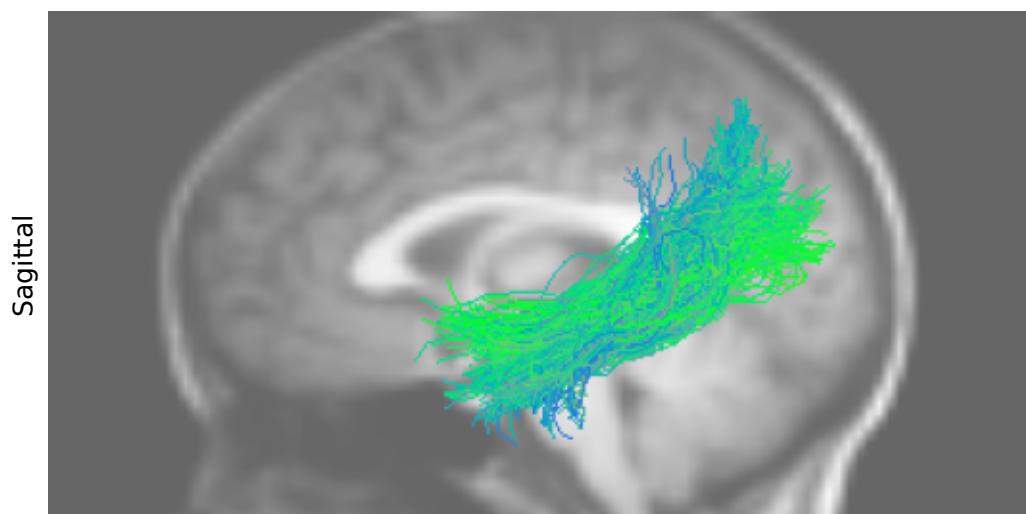
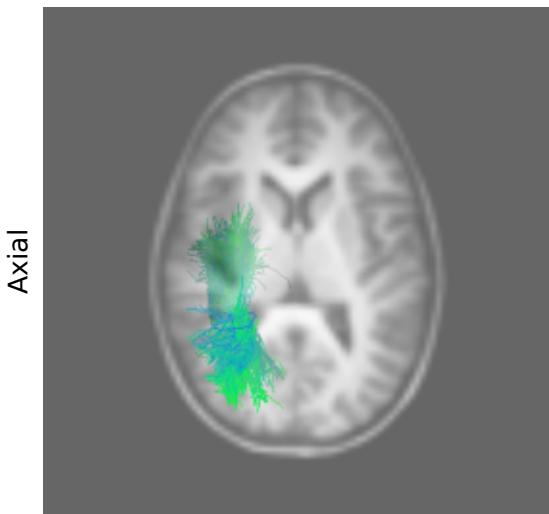
# Inferior Fronto-occipital Fasciculus - R (IFOF\_R)



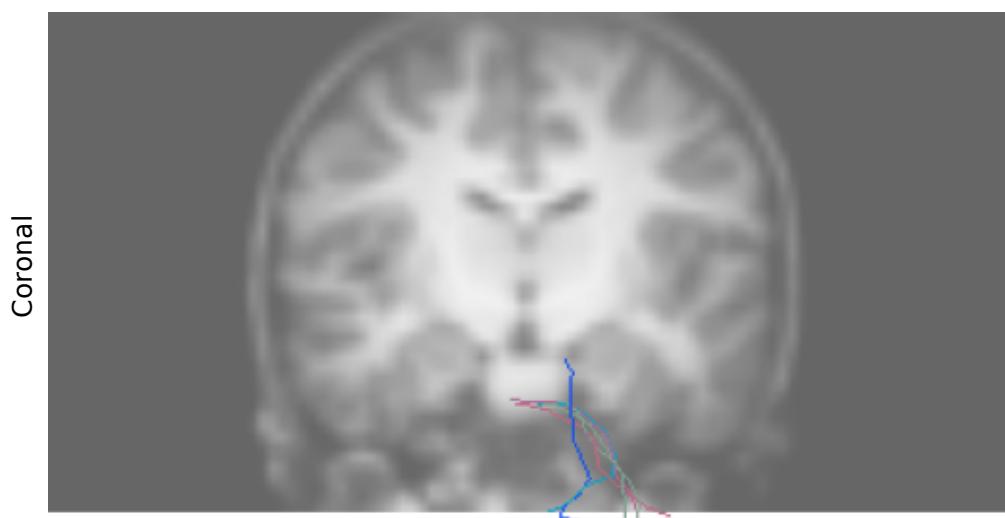
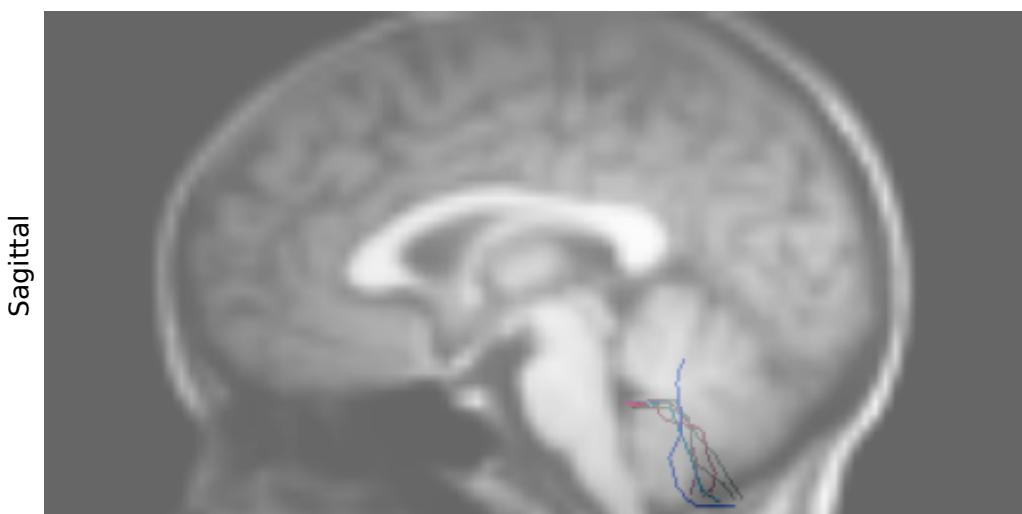
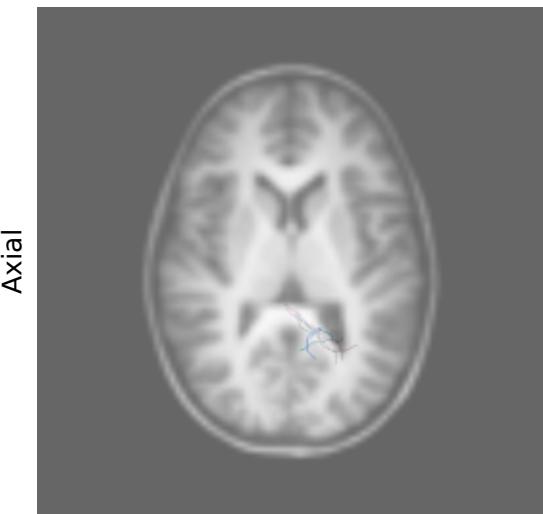
# Inferior Longitudinal Fasciculus - L (ILF\_L)



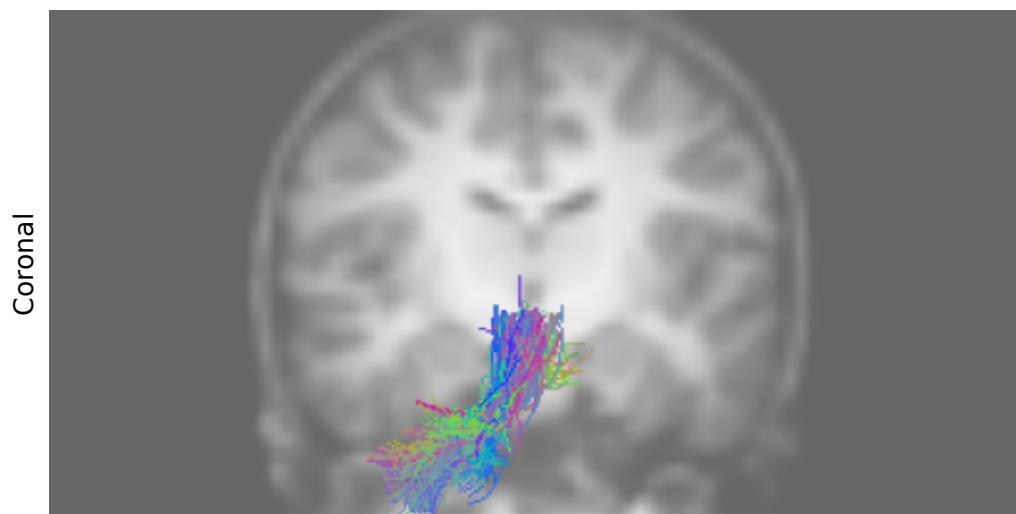
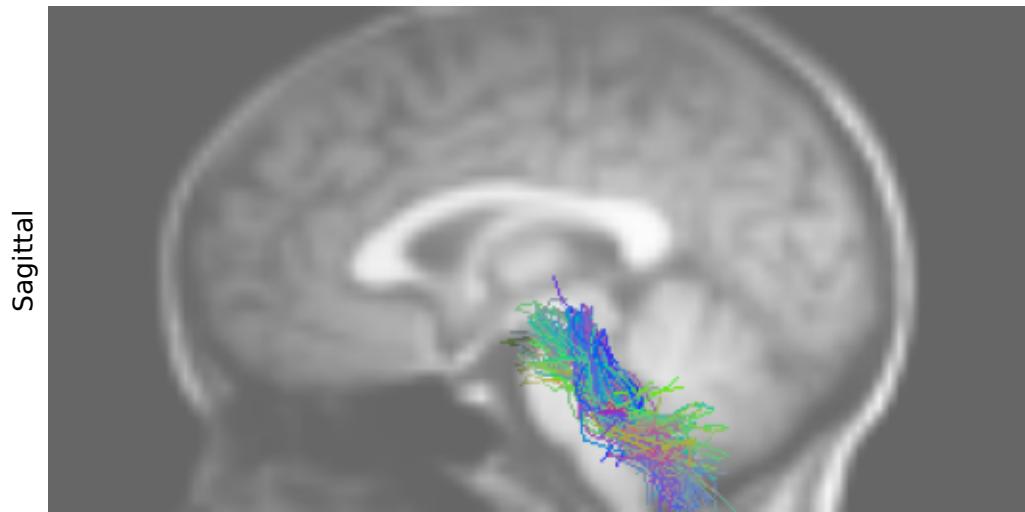
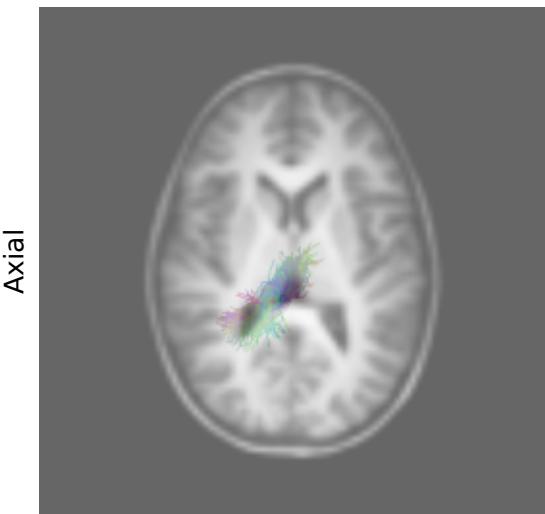
# Inferior Longitudinal Fasciculus - R (ILF\_R)



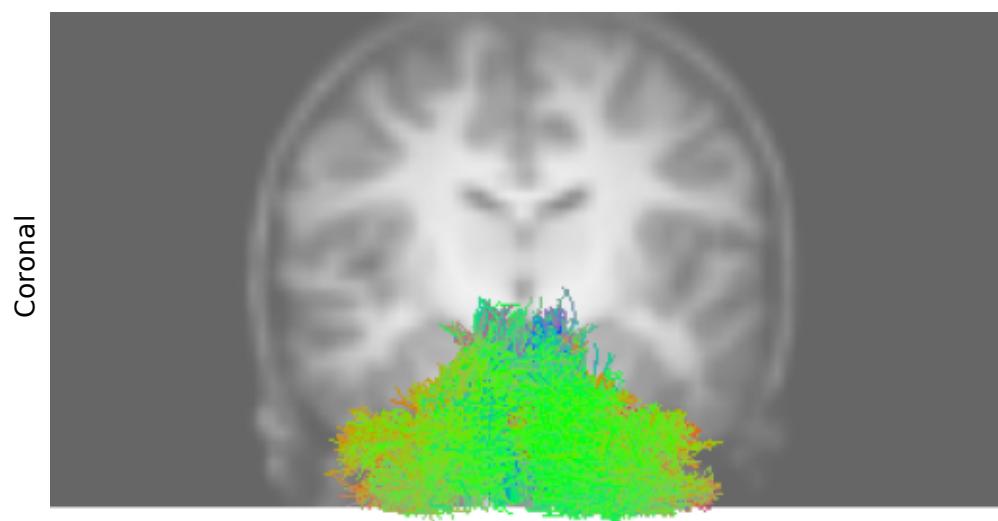
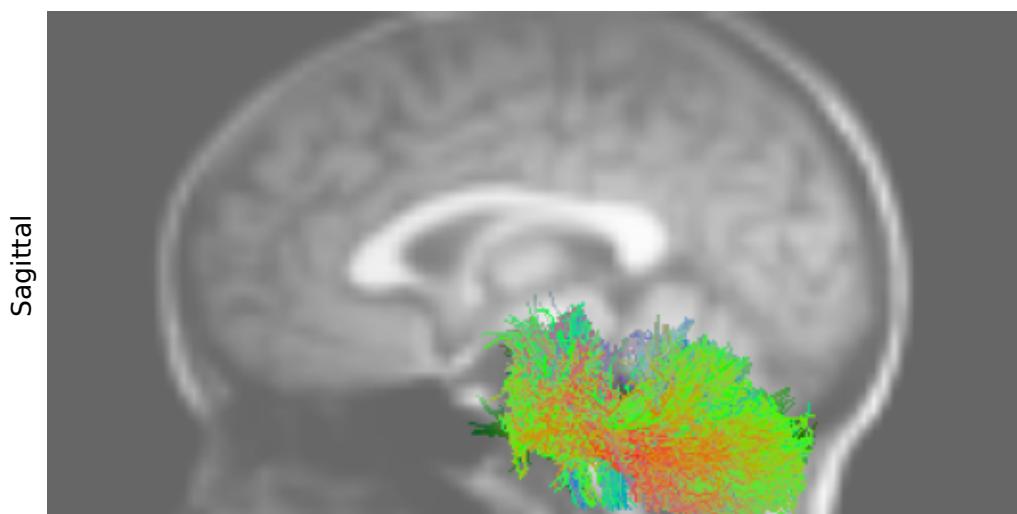
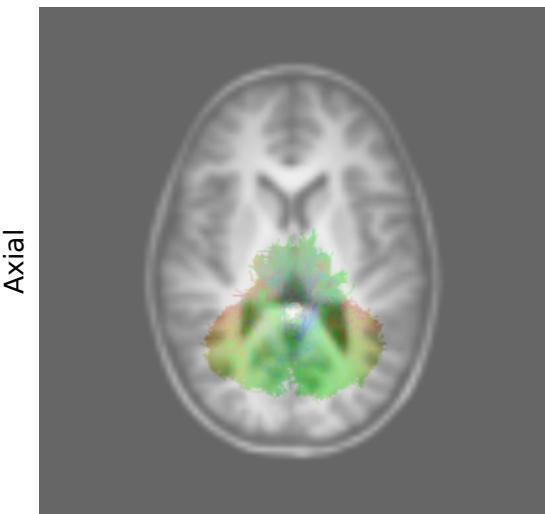
# Lateral Lemniscus - L (LL\_L)



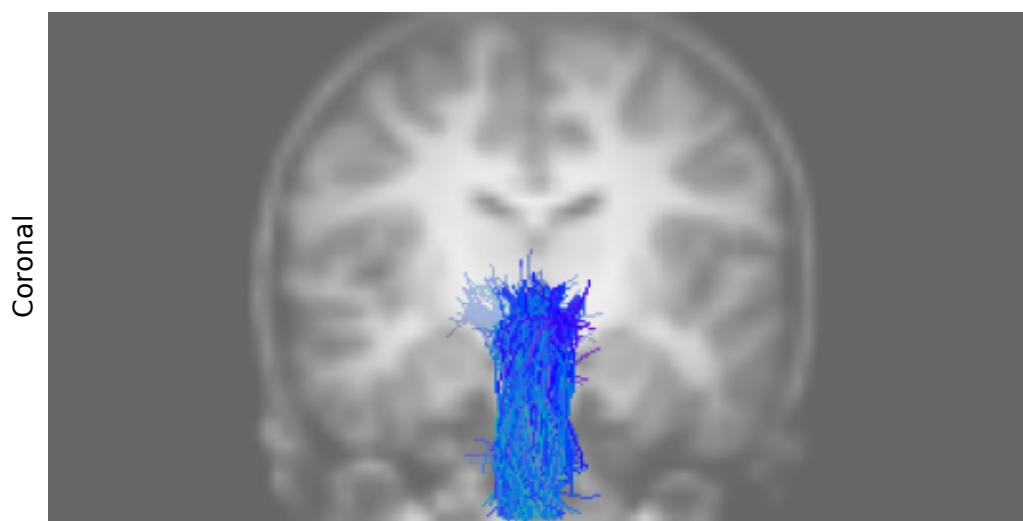
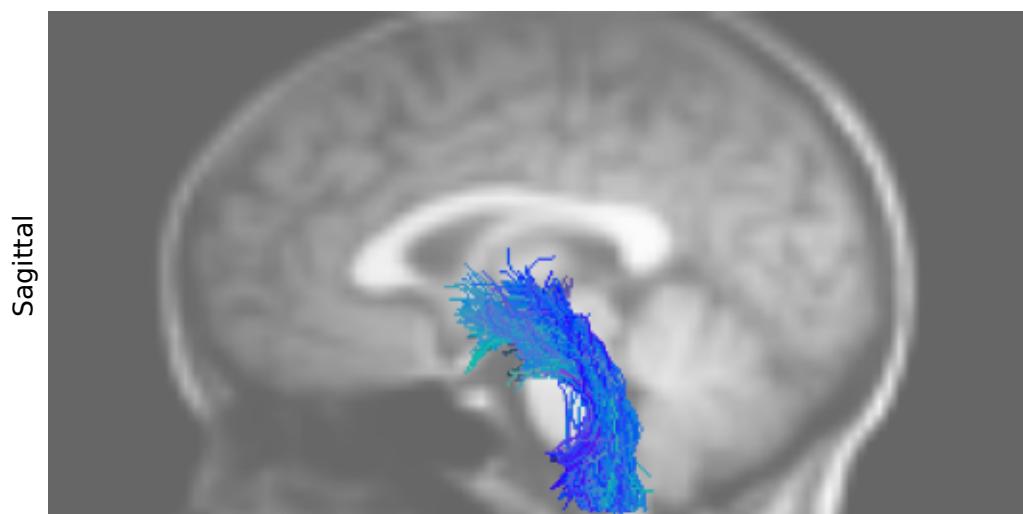
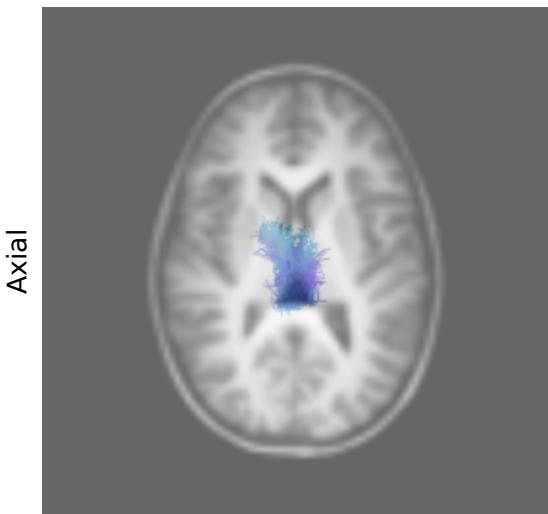
# Lateral Lemniscus - R (LL\_R)



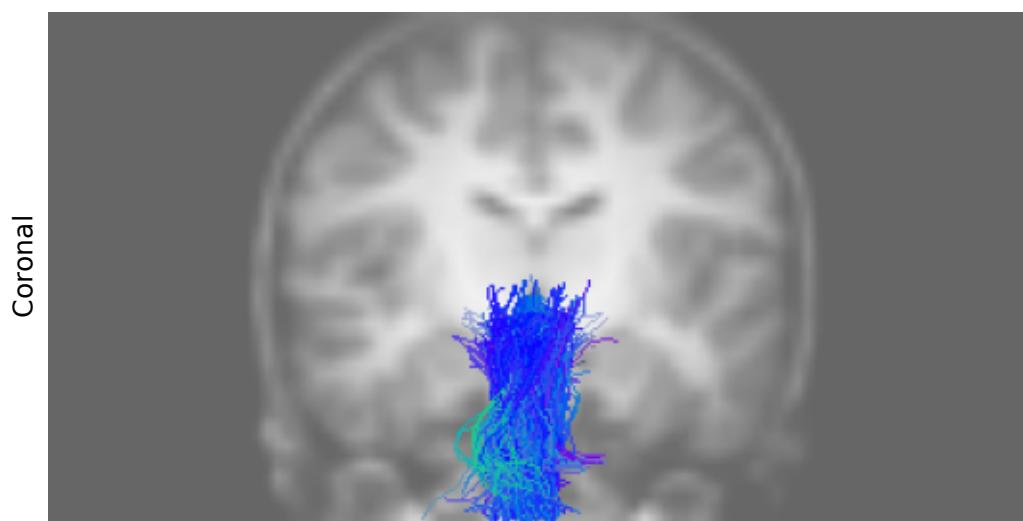
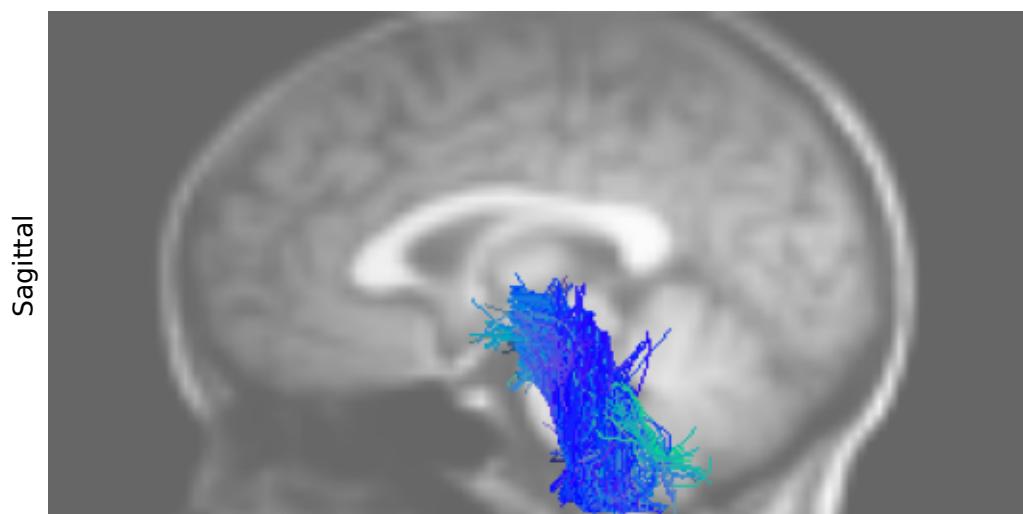
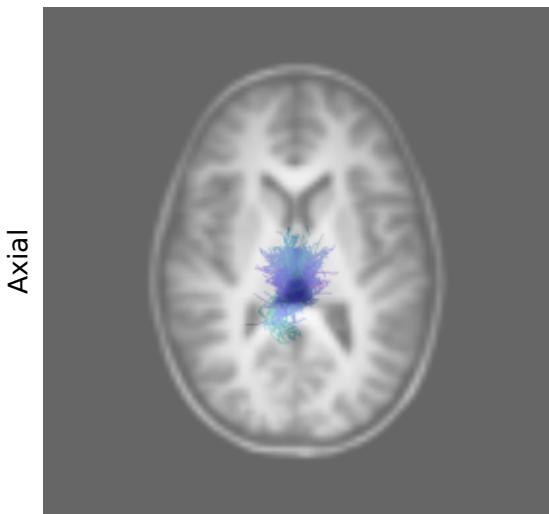
# Middle Cerebellar Peduncle (MCP)



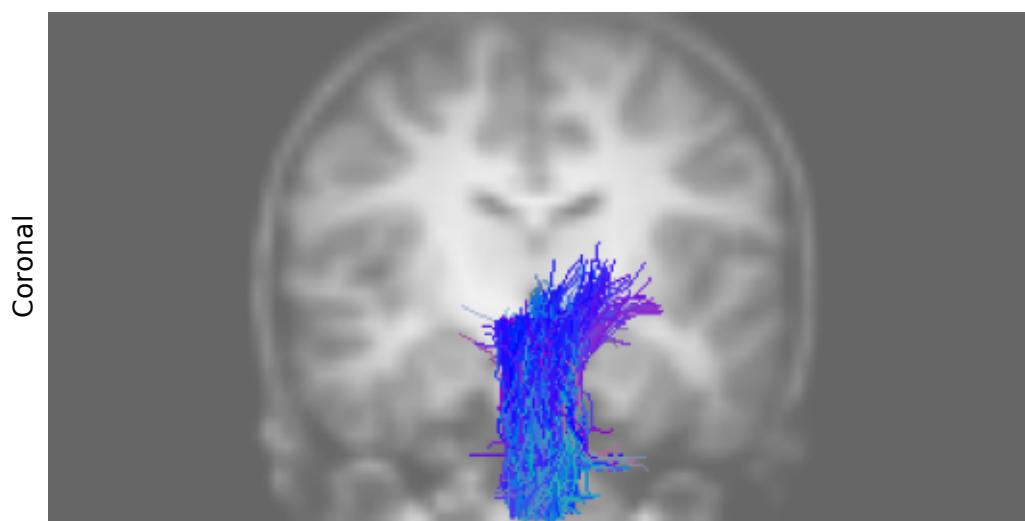
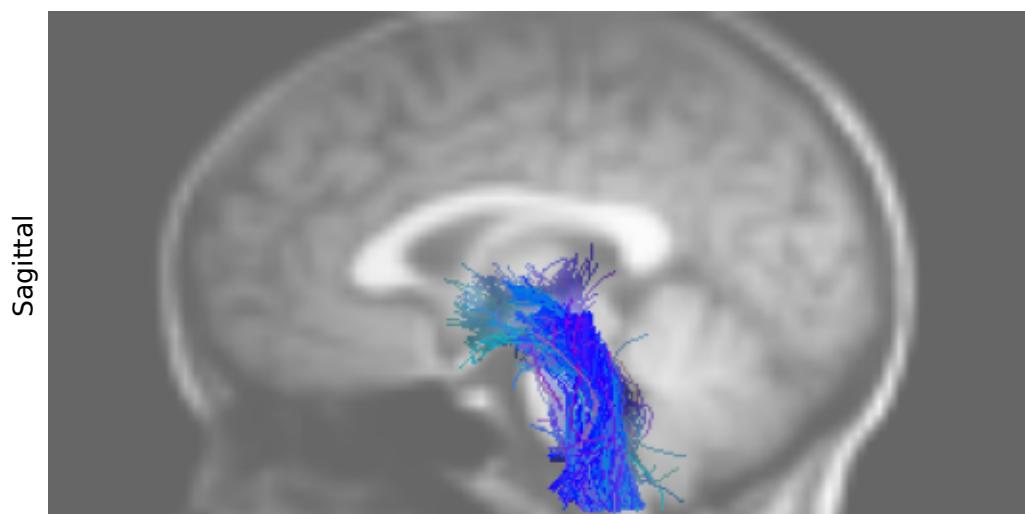
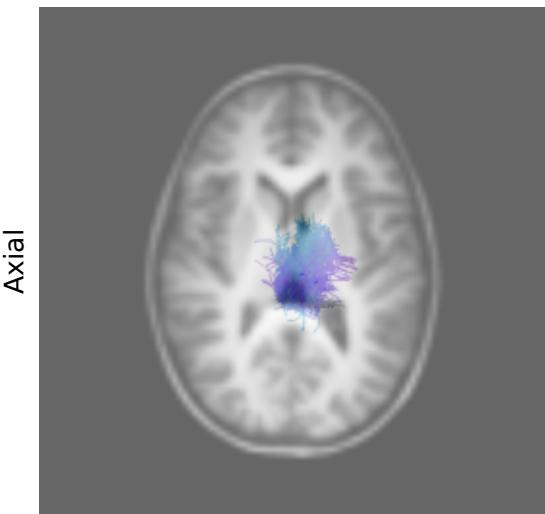
# Medial Longitudinal fasciculus - L (MLF\_L)



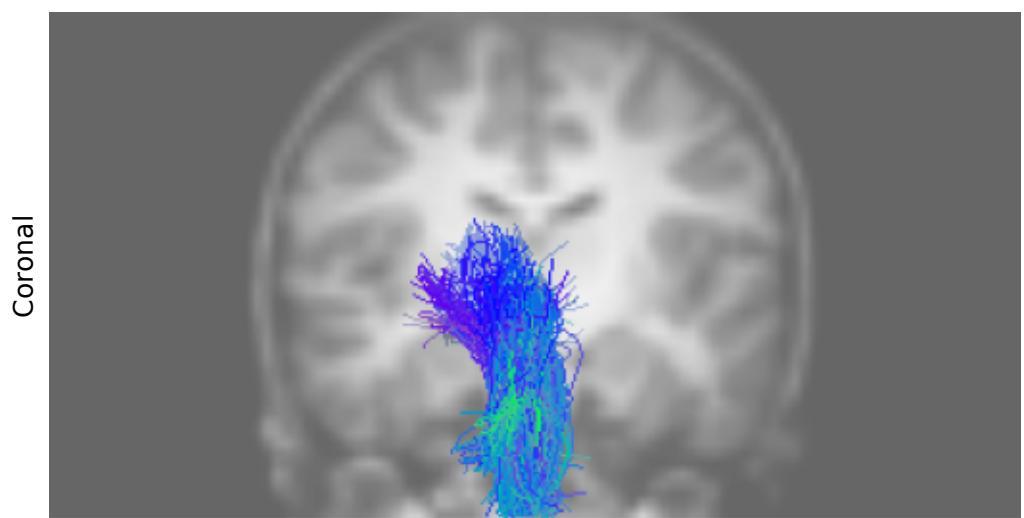
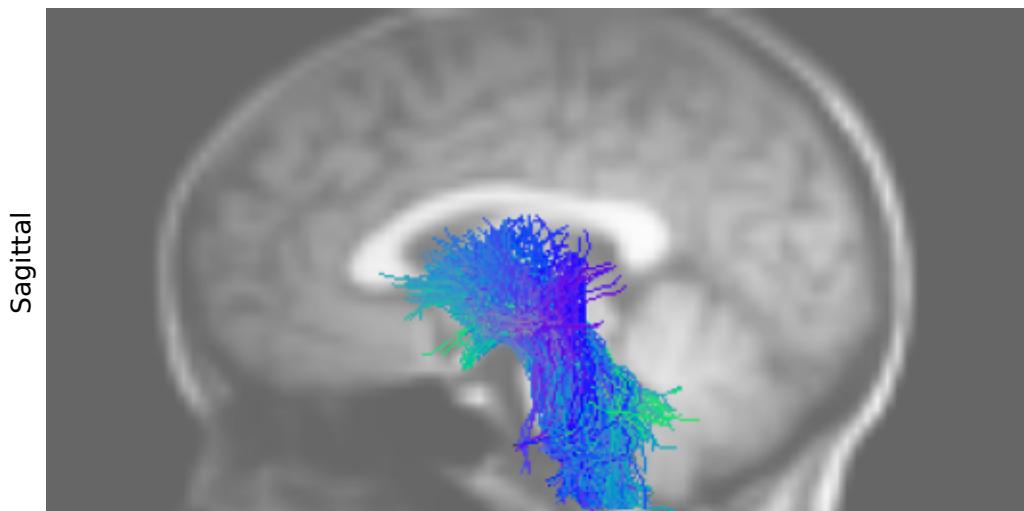
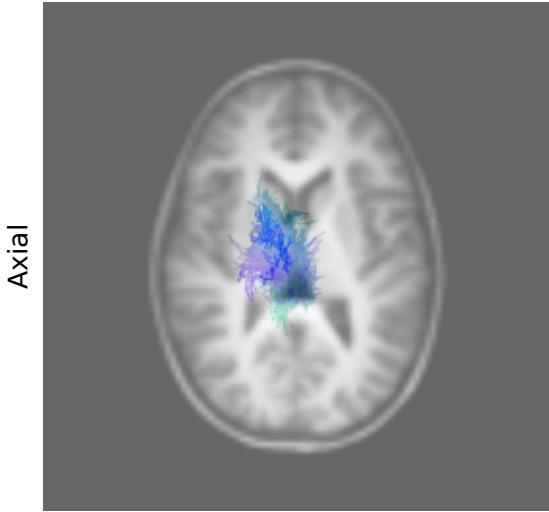
# Medial Longitudinal fasciculus - R (MLF\_R)



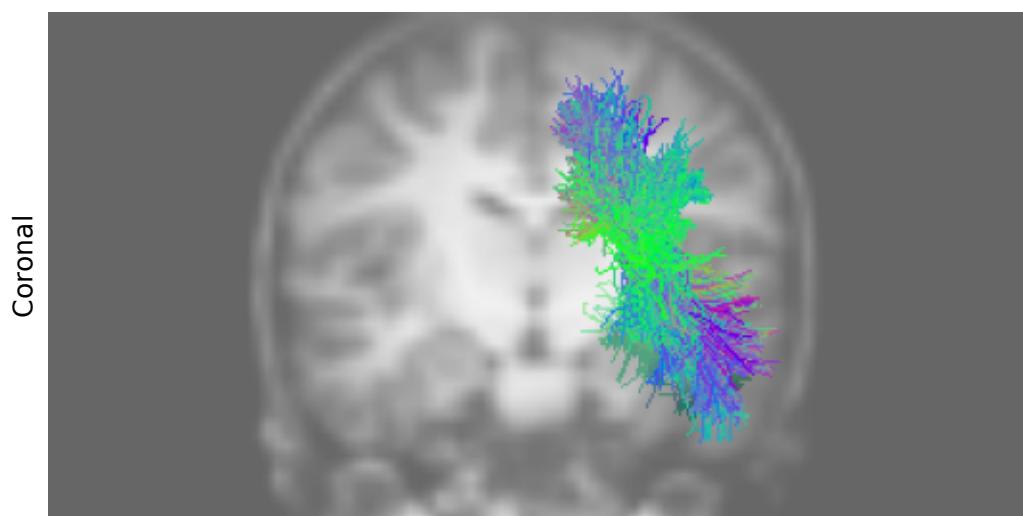
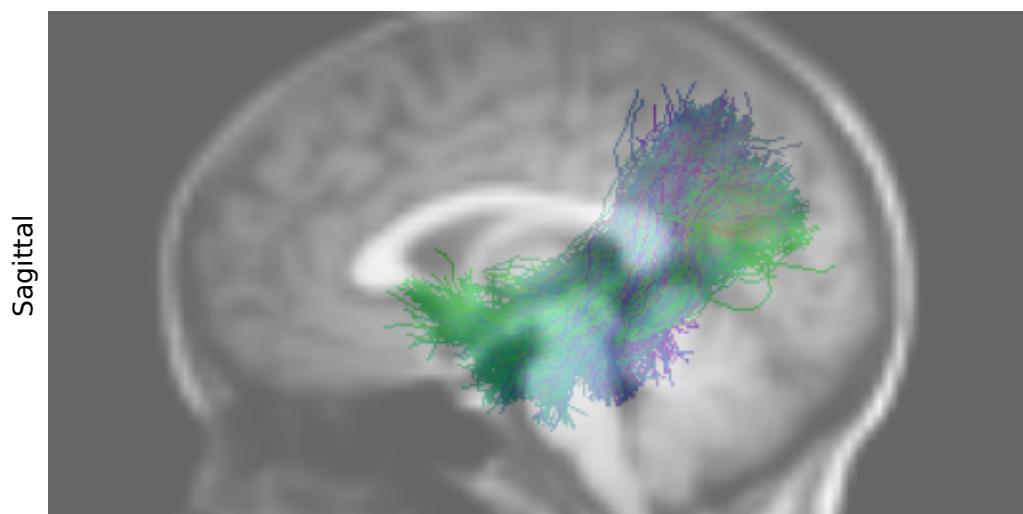
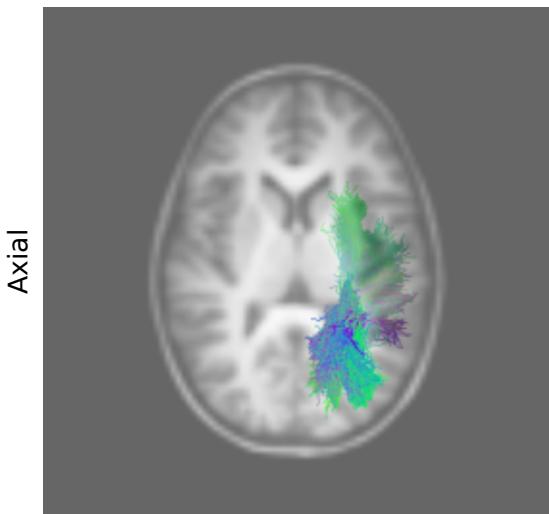
# Medial Lemniscus - L (ML\_L)



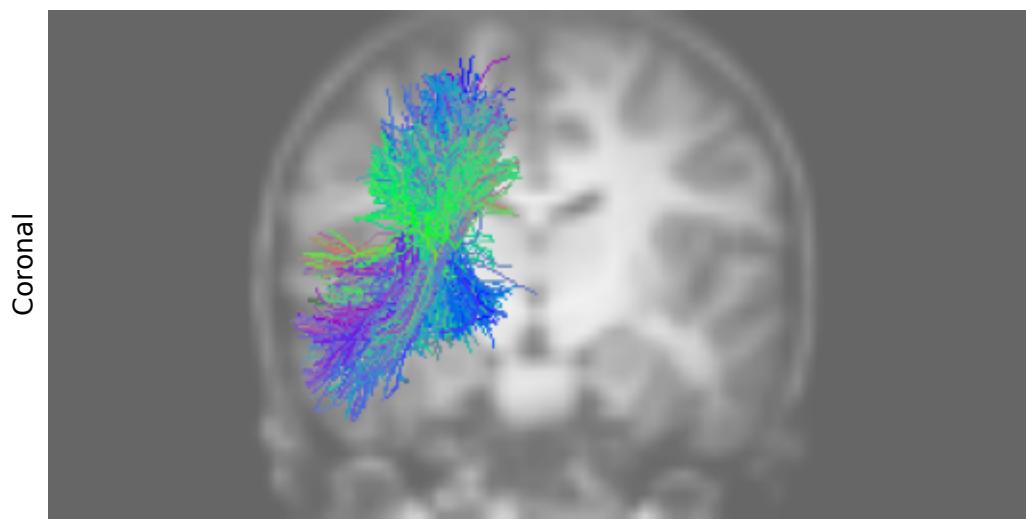
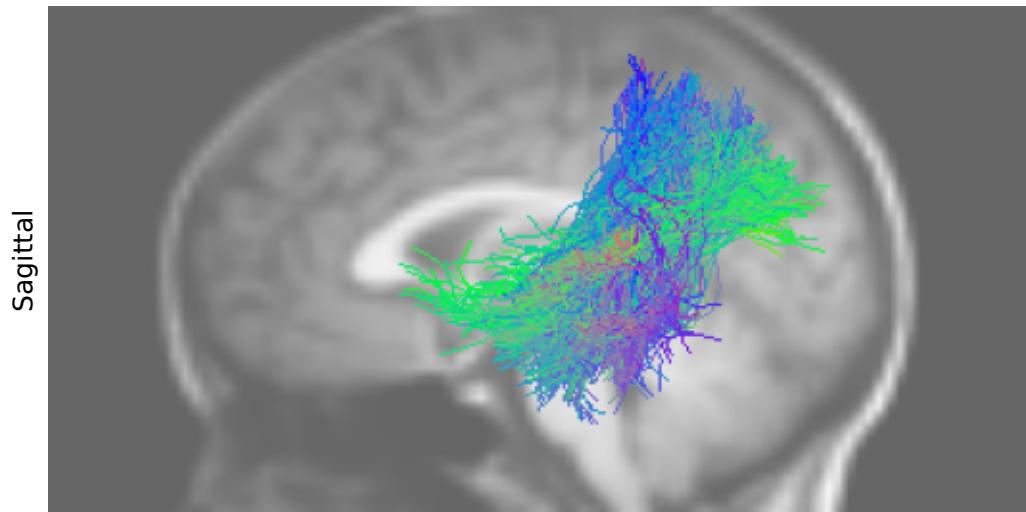
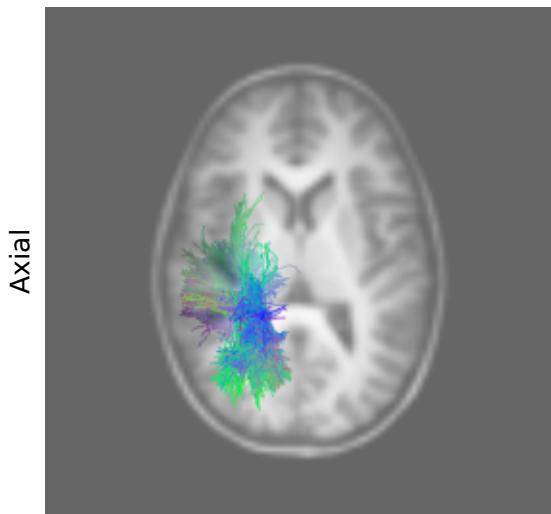
# Medial Lemniscus - R (ML\_R)



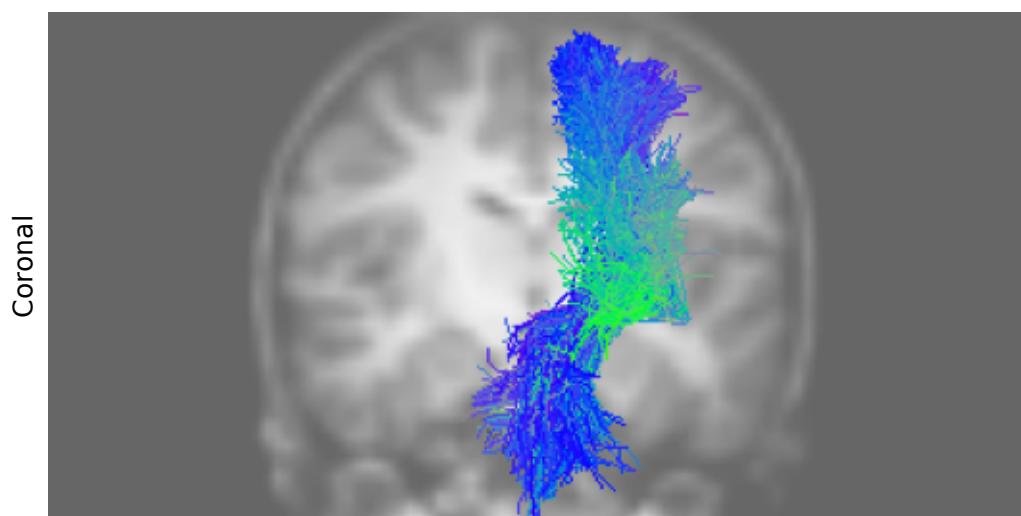
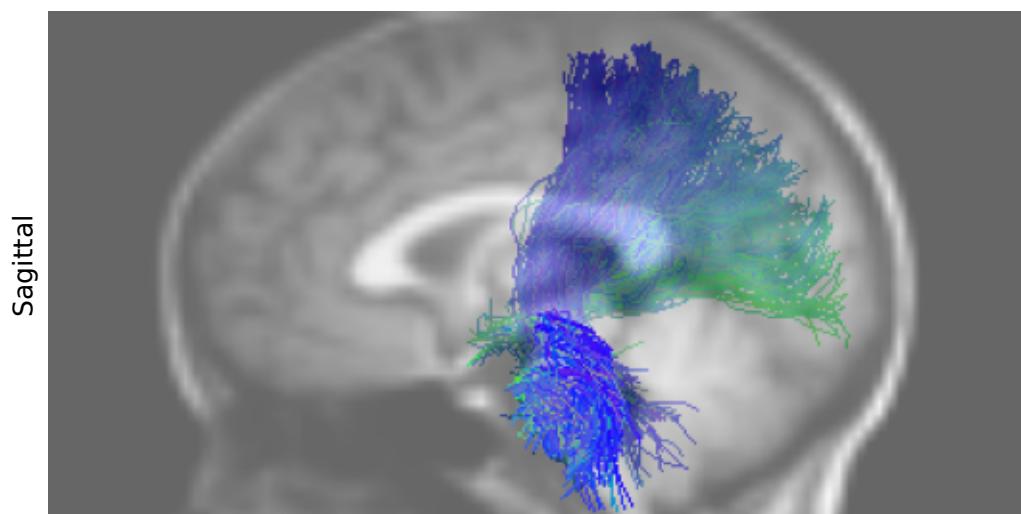
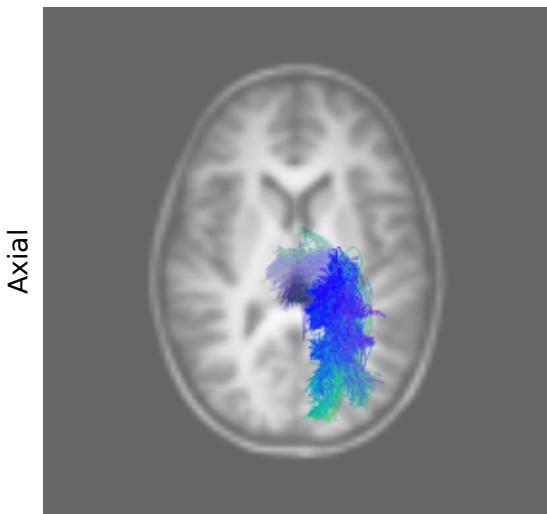
# Middle Longitudinal Fasciculus - L (MdLF\_L)



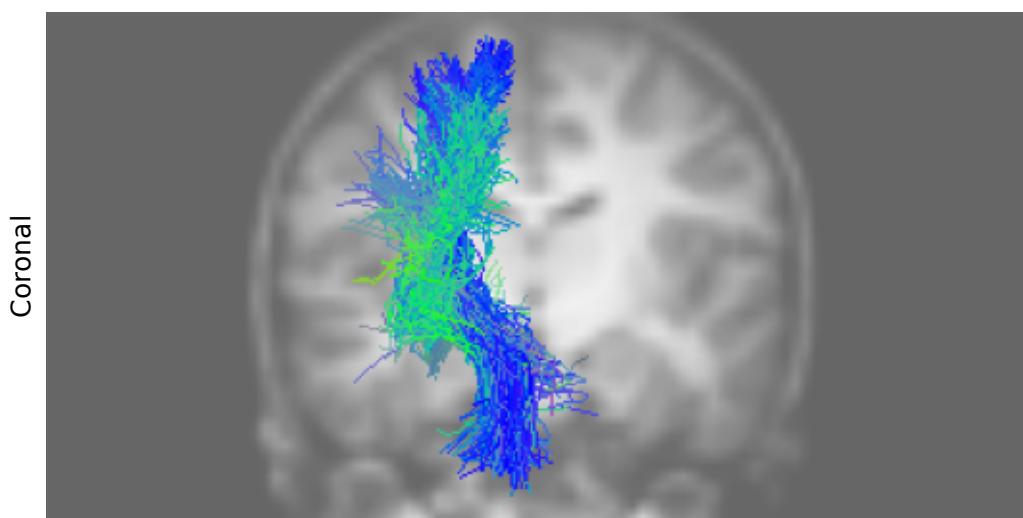
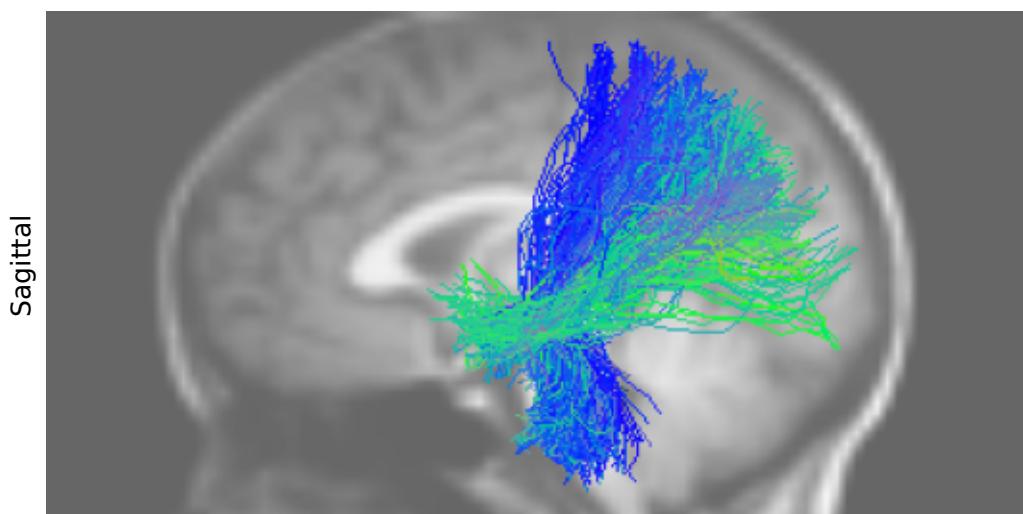
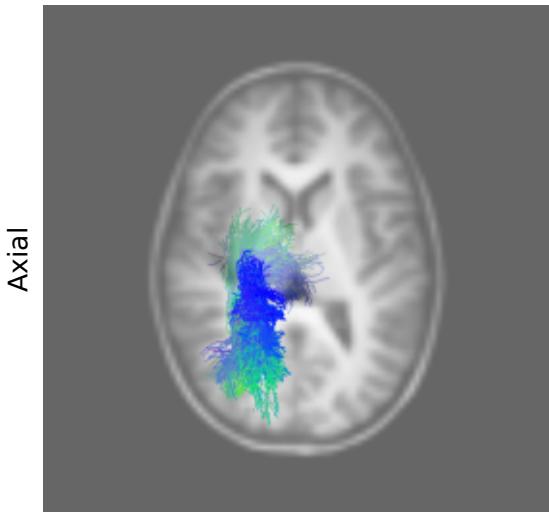
# Middle Longitudinal Fasciculus - R (MdLF\_R)



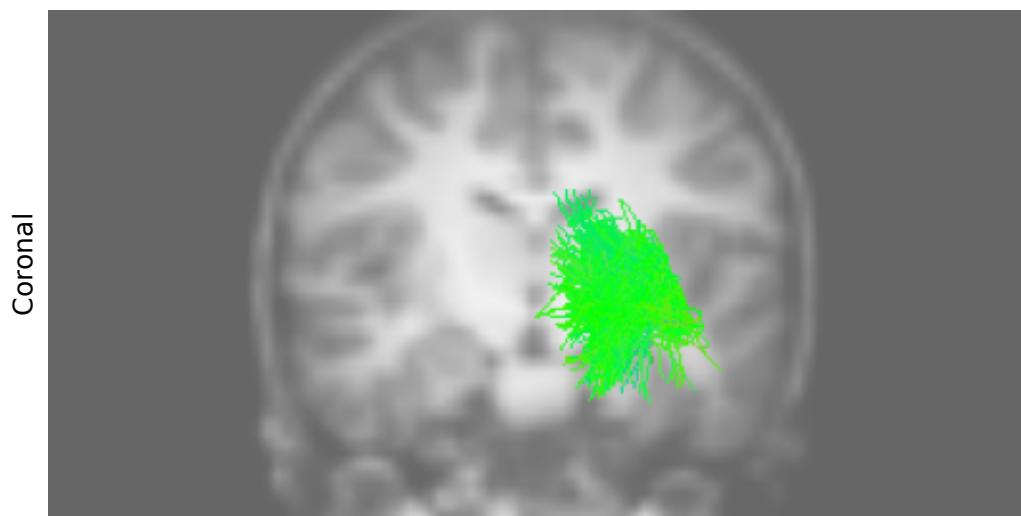
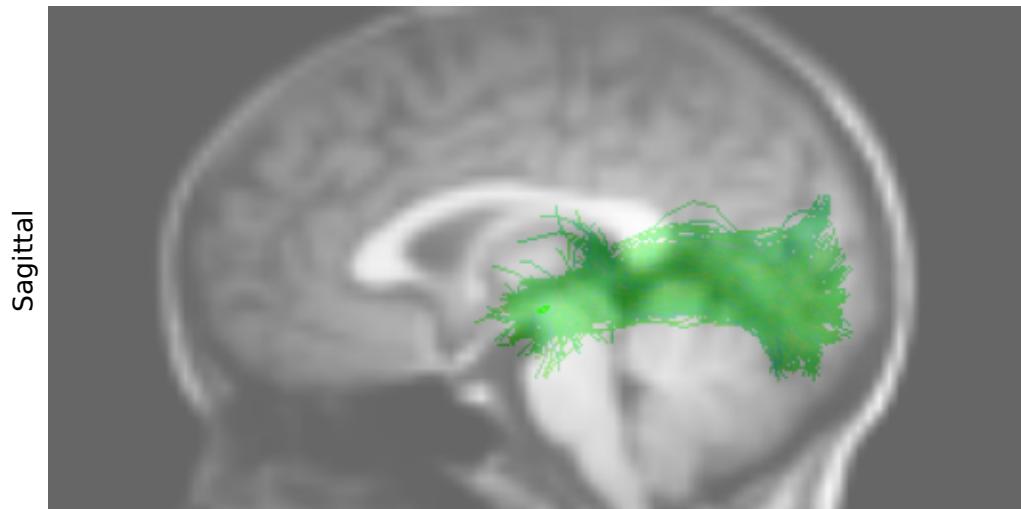
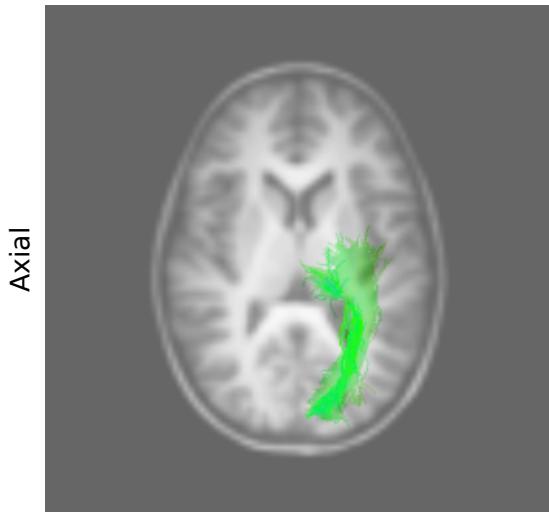
# Occipito Pontine Tract - L (OPT\_L)



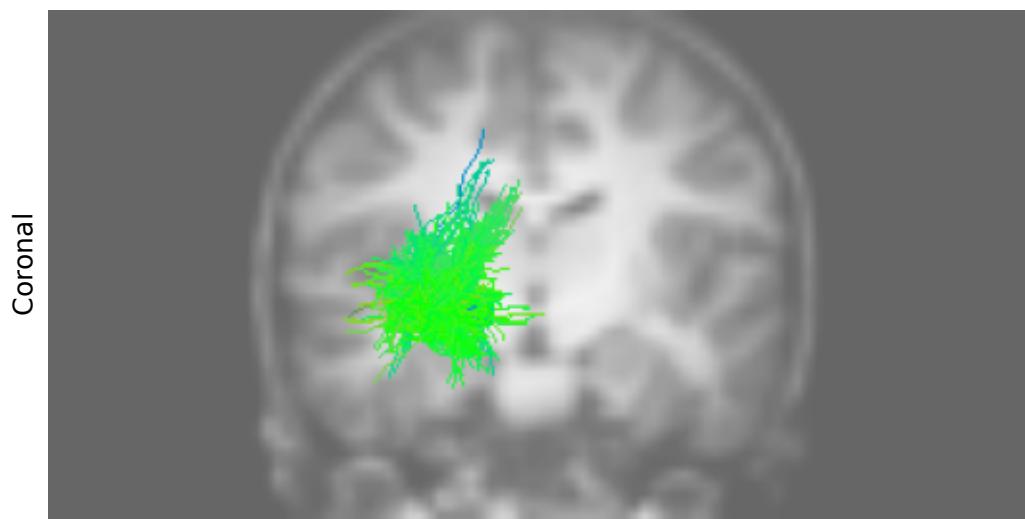
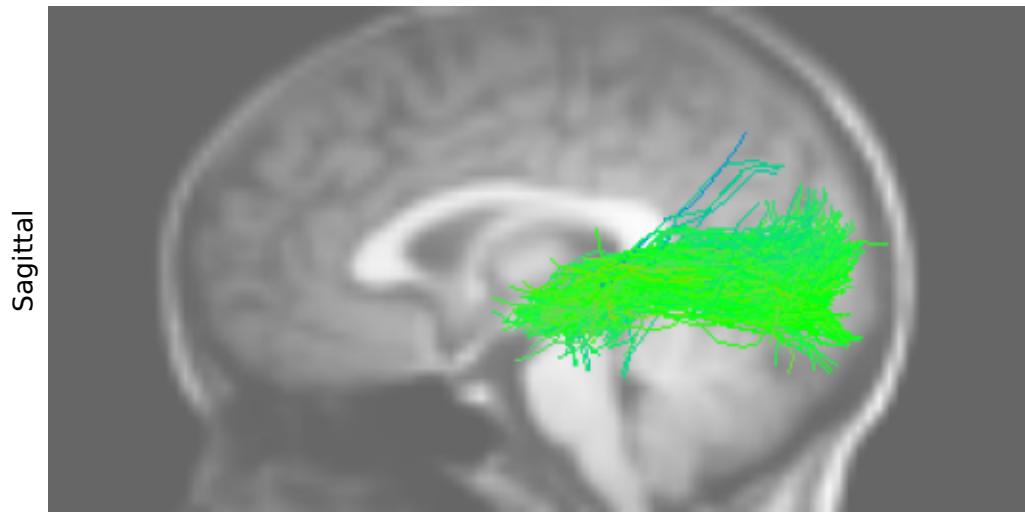
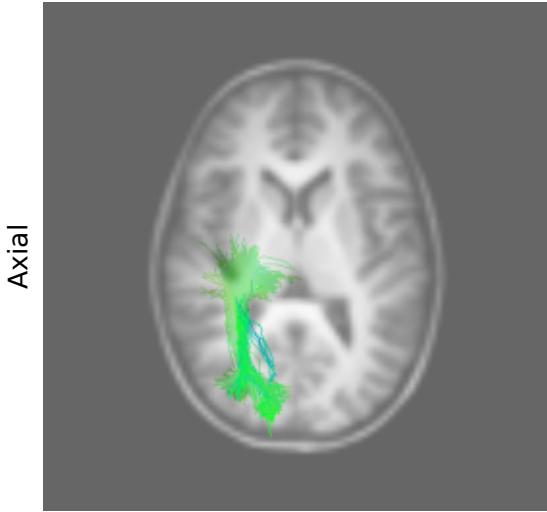
# Occipito Pontine Tract - R (OPT\_R)



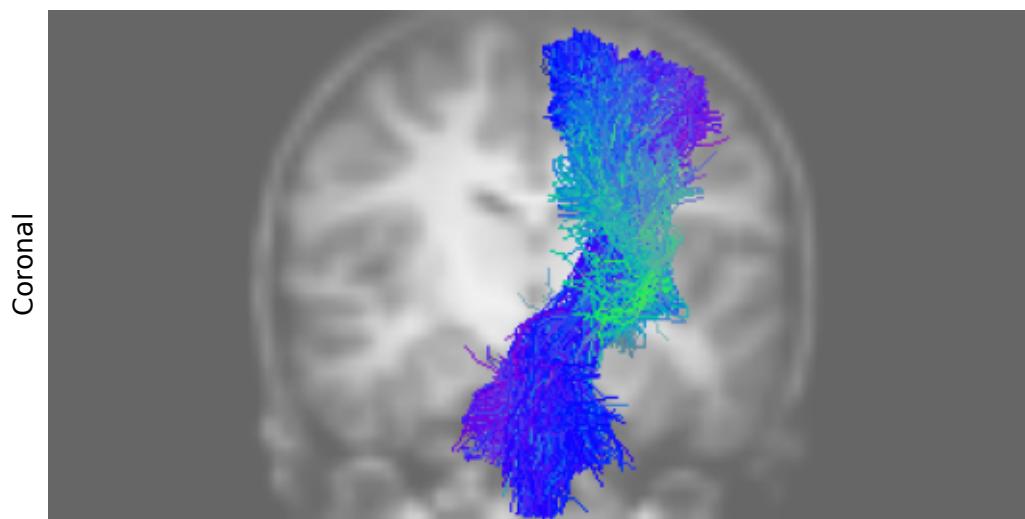
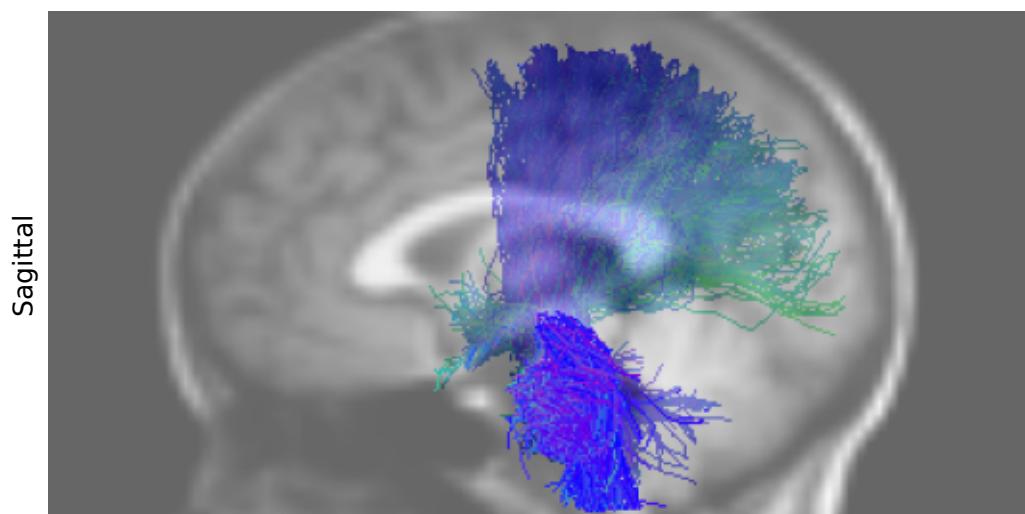
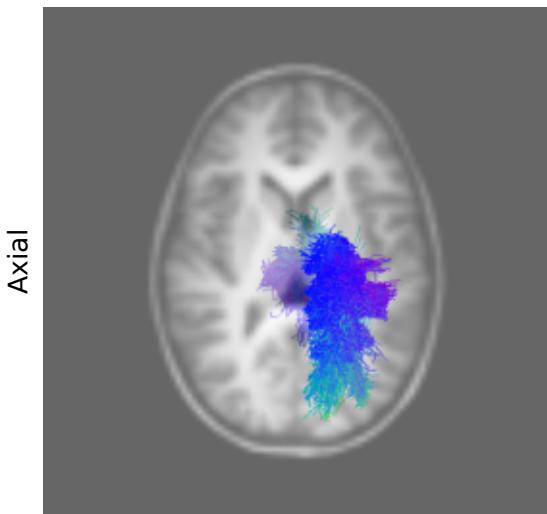
# Optic Radiation - L (OR\_L)



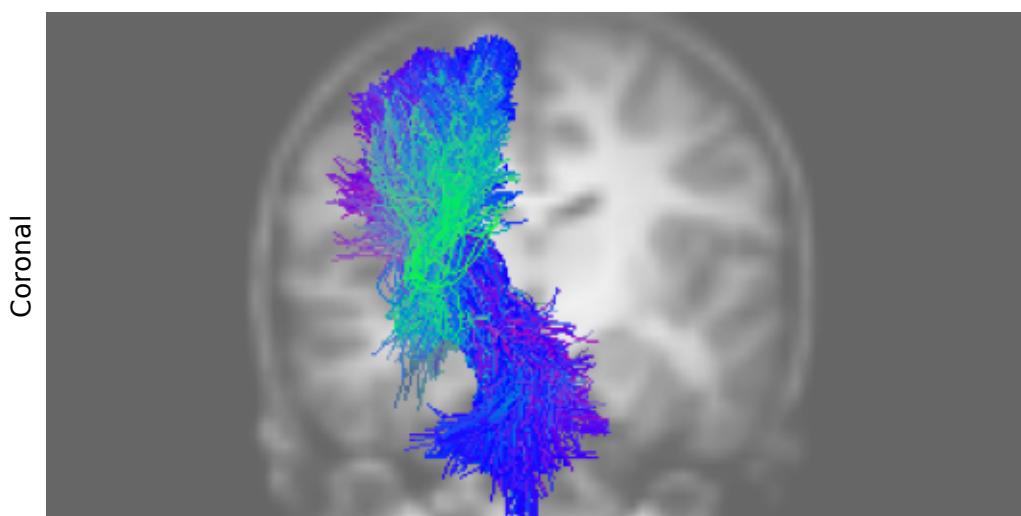
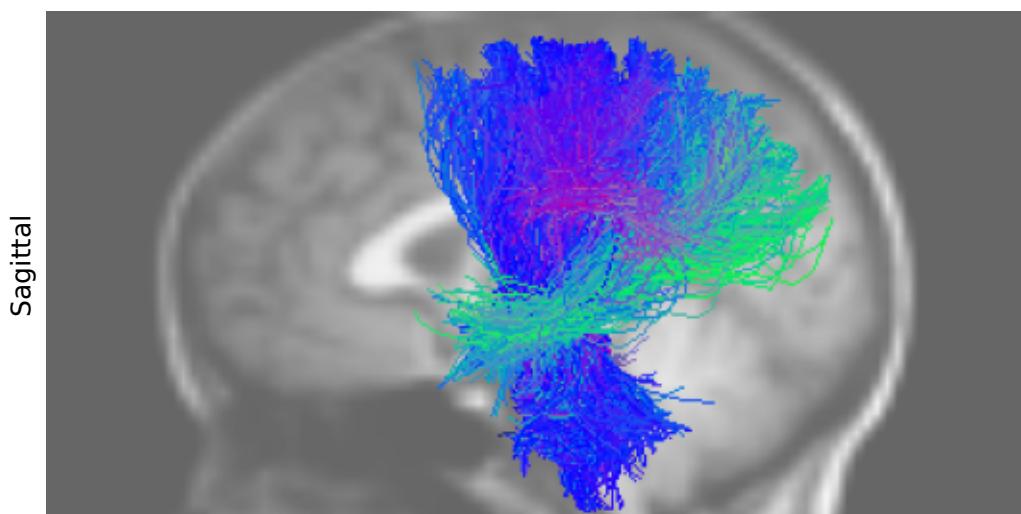
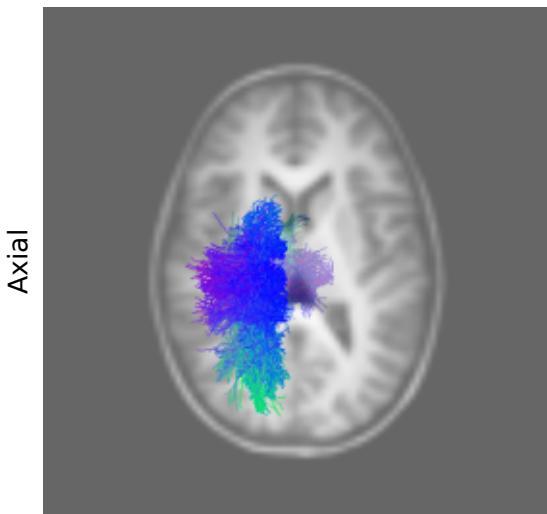
# Optic Radiation - R (OR\_R)



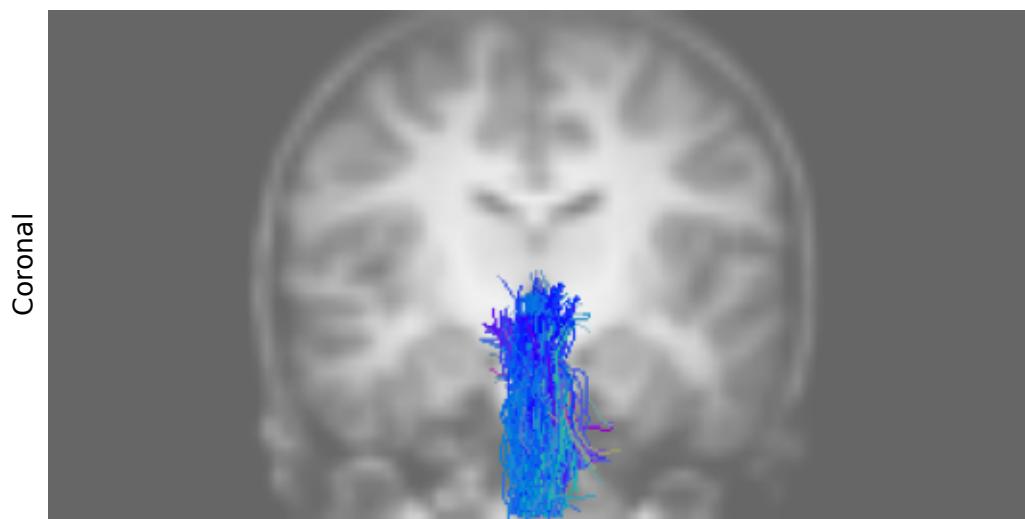
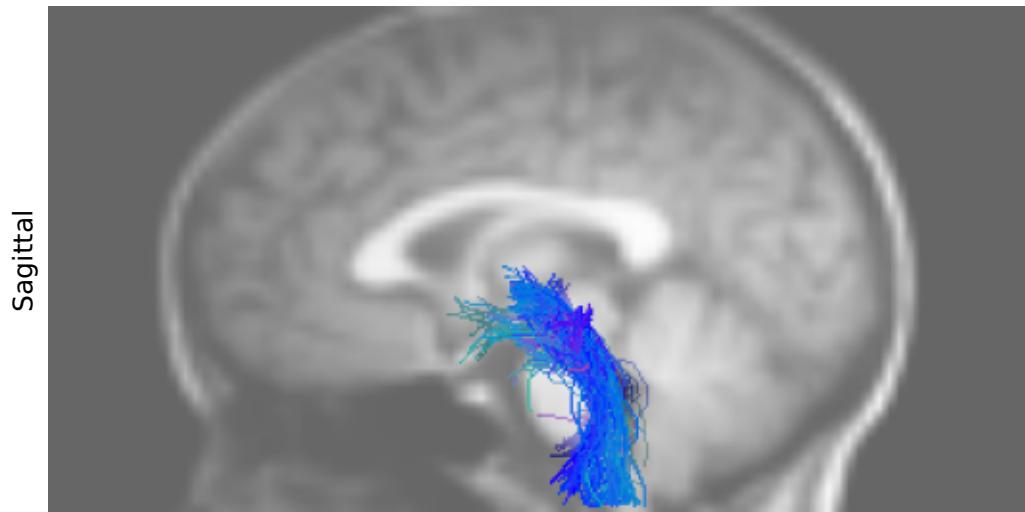
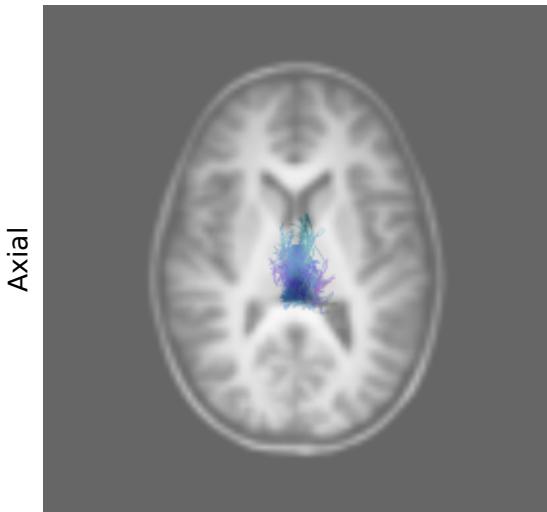
# Parieto Pontine Tract - L (PPT\_L)



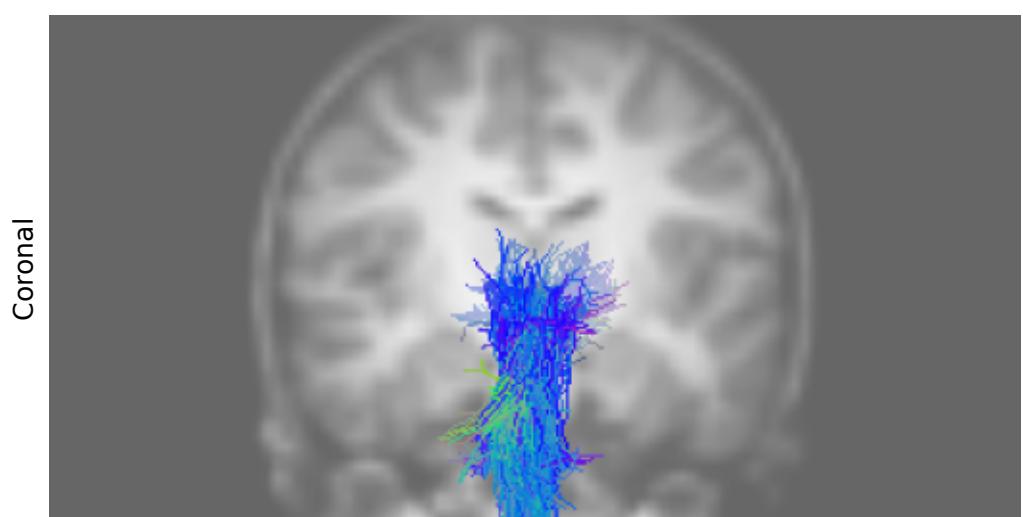
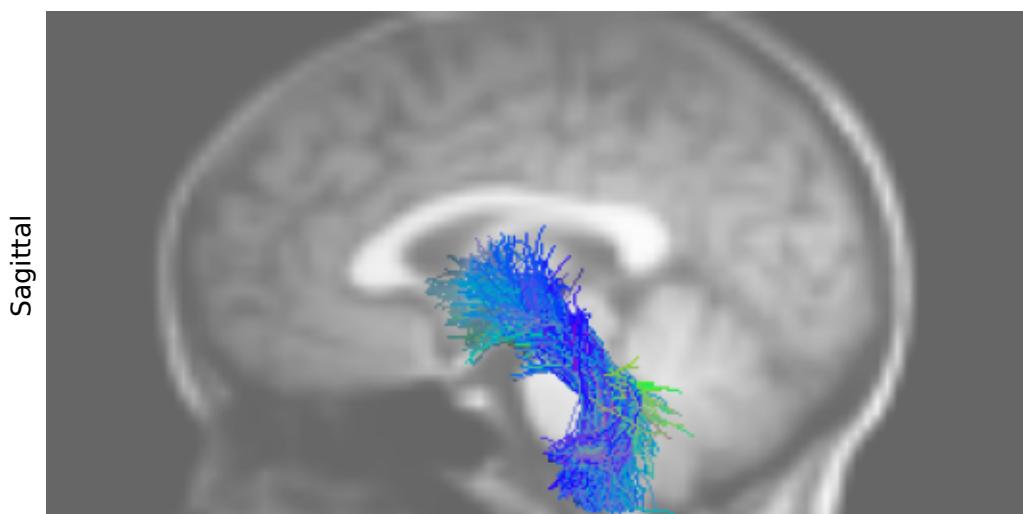
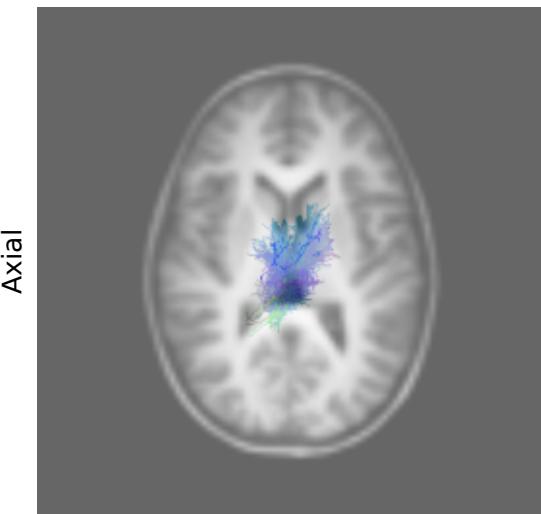
# Parieto Pontine Tract - R (PPT\_R)



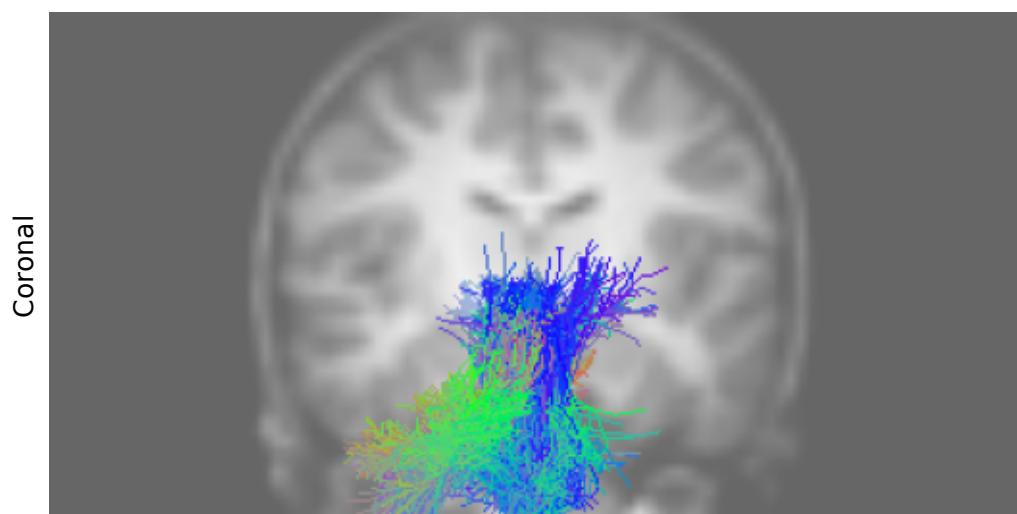
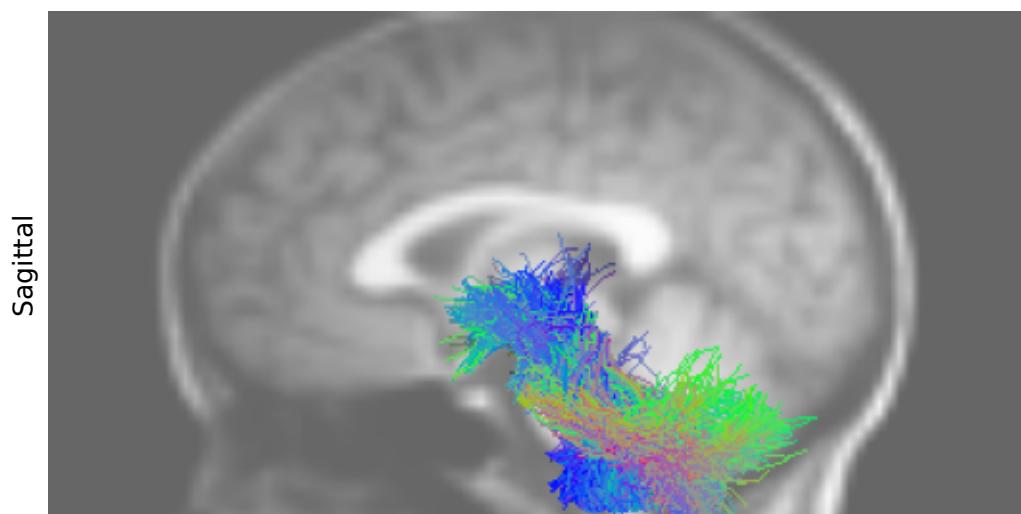
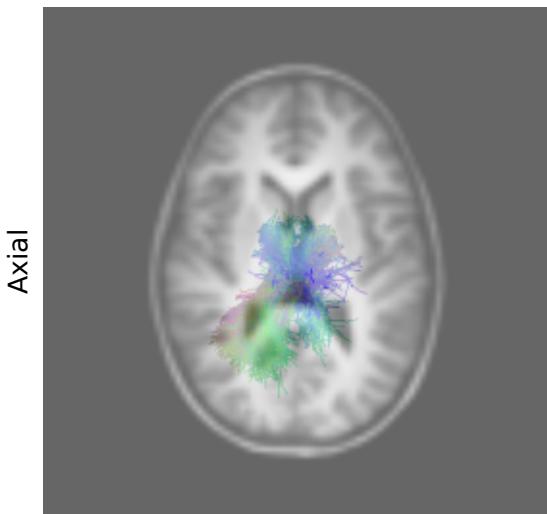
# Rubrospinal Tract - L (RST\_L)



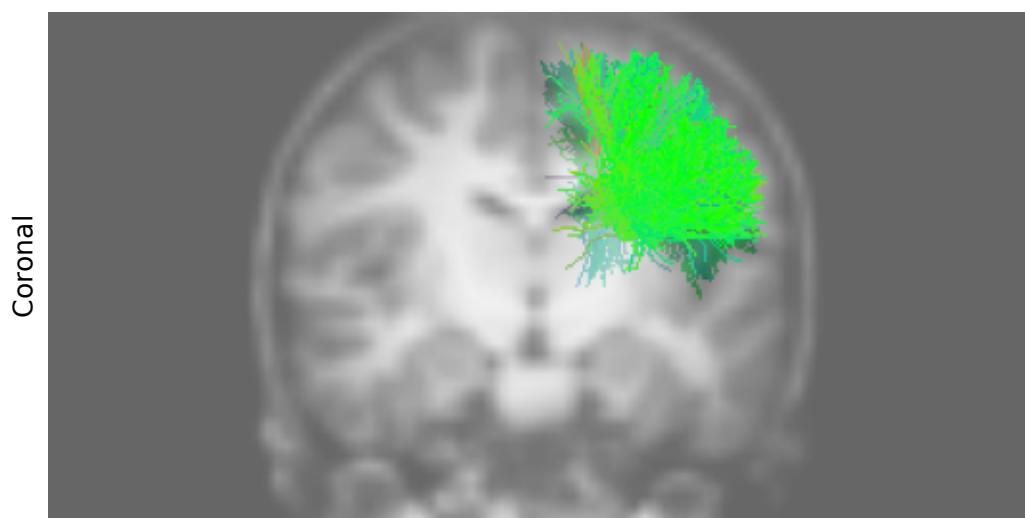
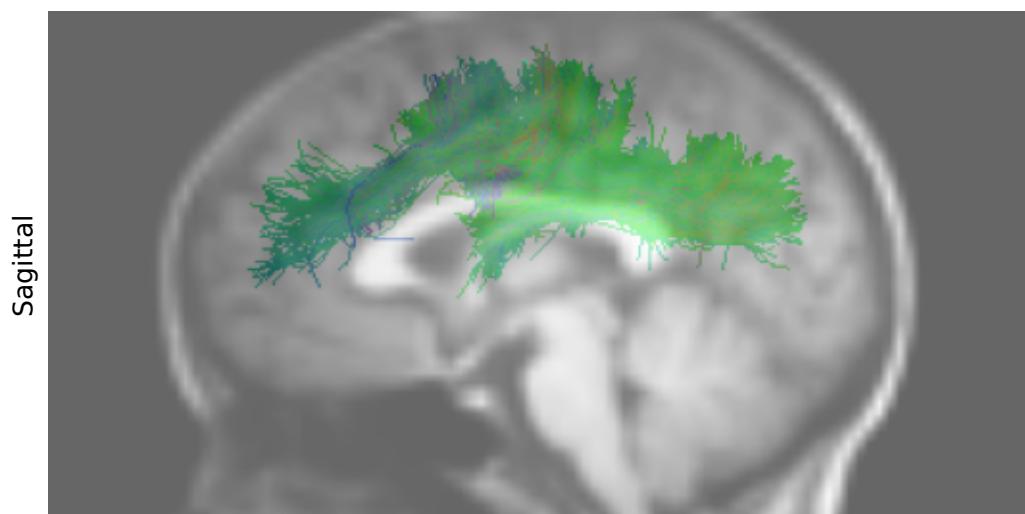
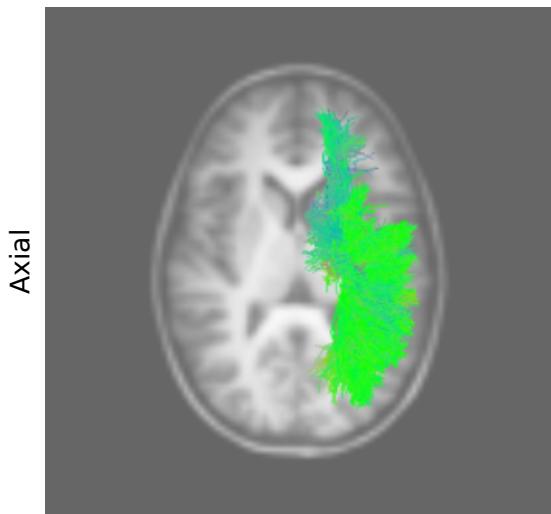
# Rubrospinal Tract - R (RST\_R)



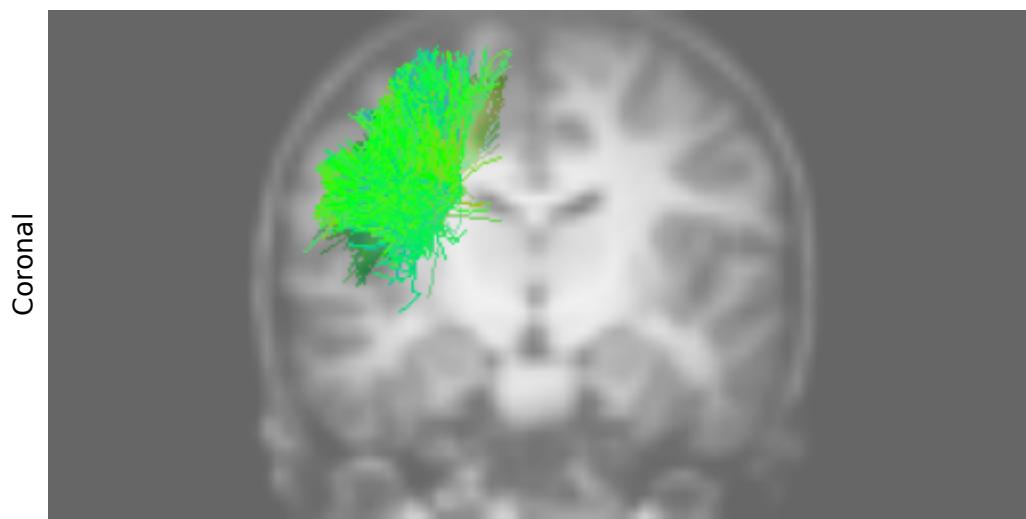
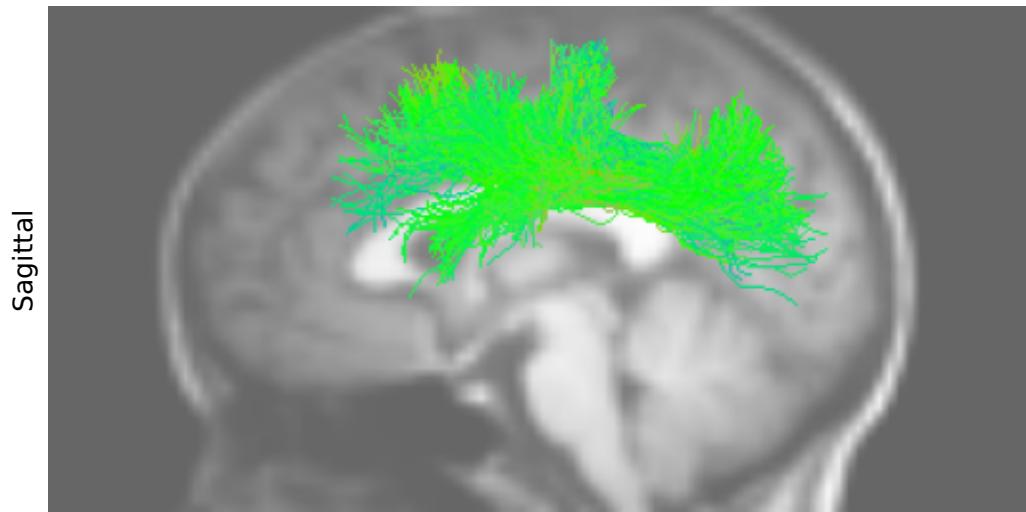
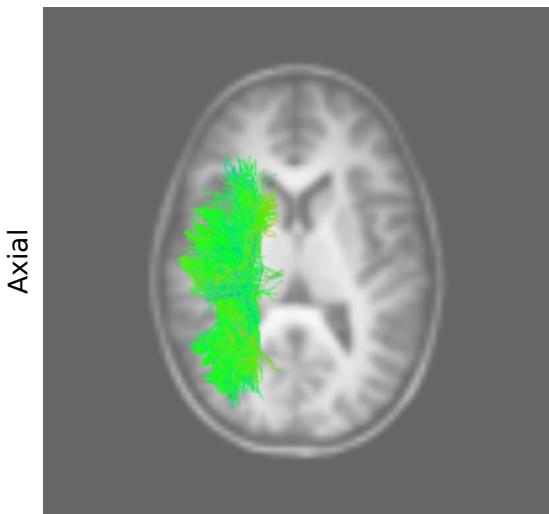
# Superior Cerebellar Peduncle (SCP)



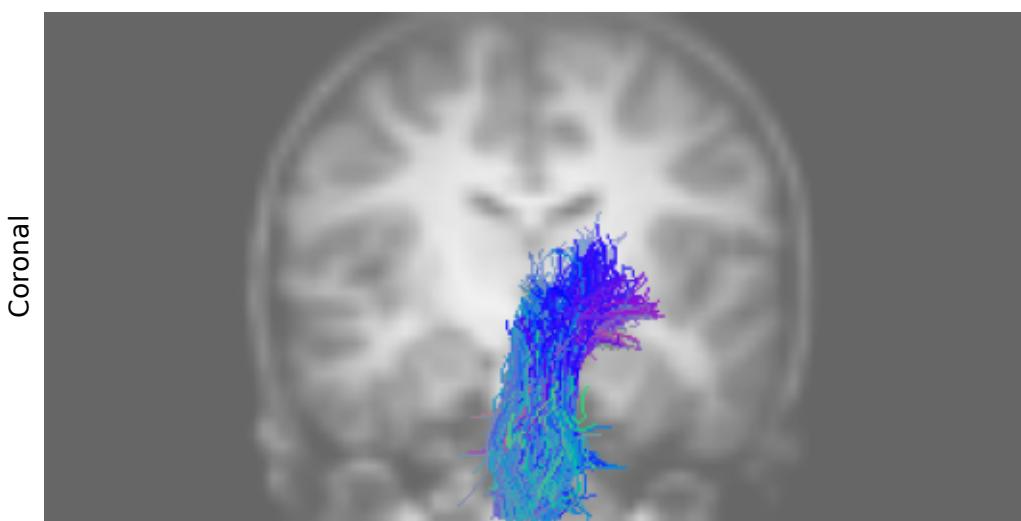
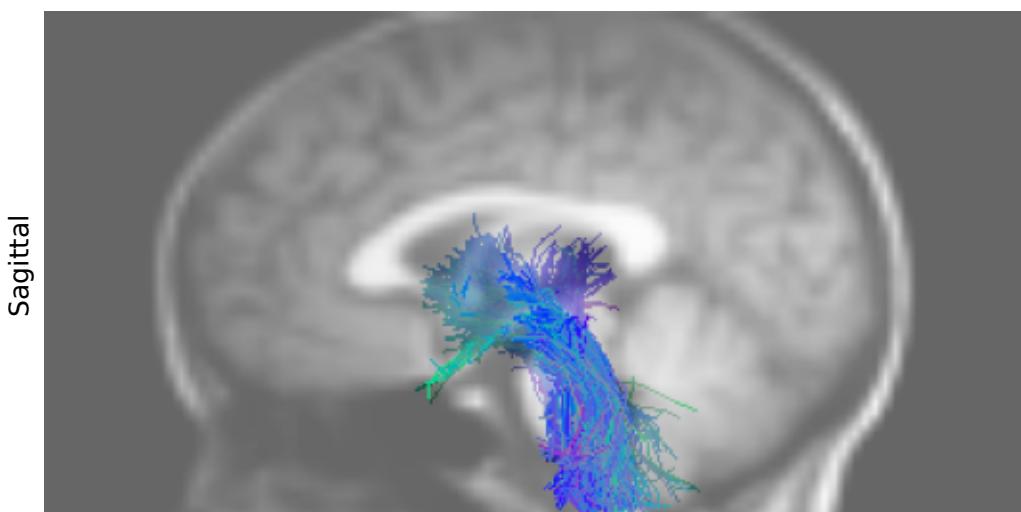
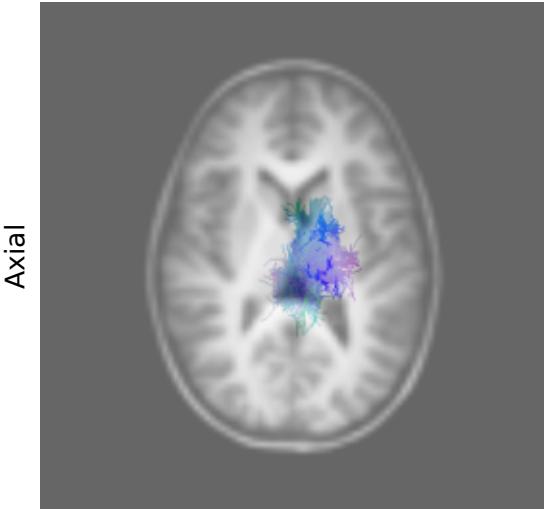
# Superior longitudinal fasciculus - L (SLF\_L)



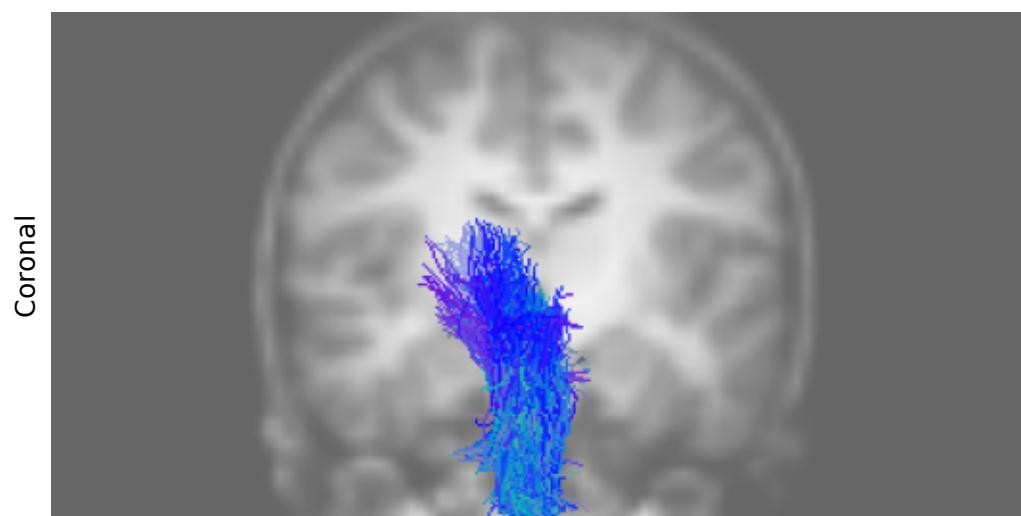
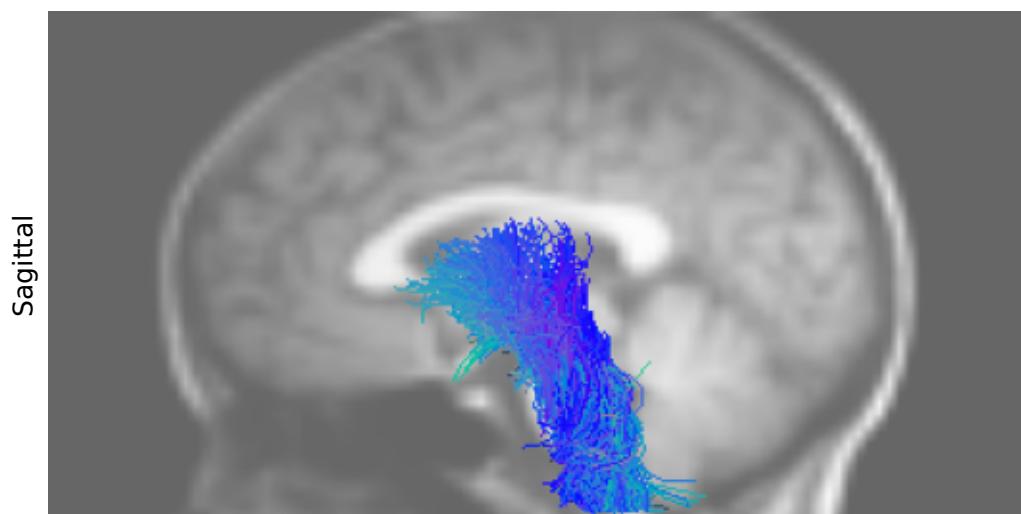
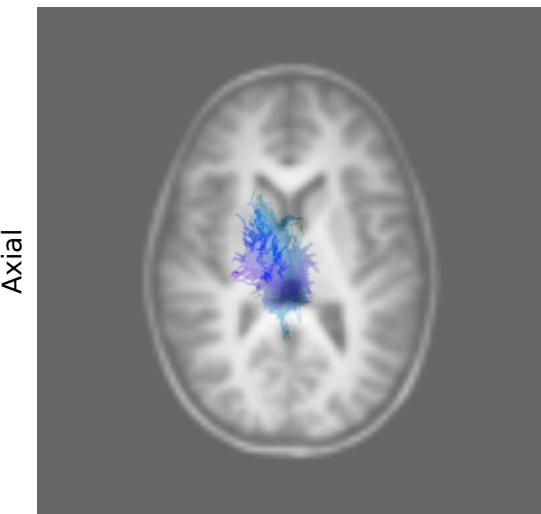
# Superior longitudinal fasciculus - R (SLF\_R)



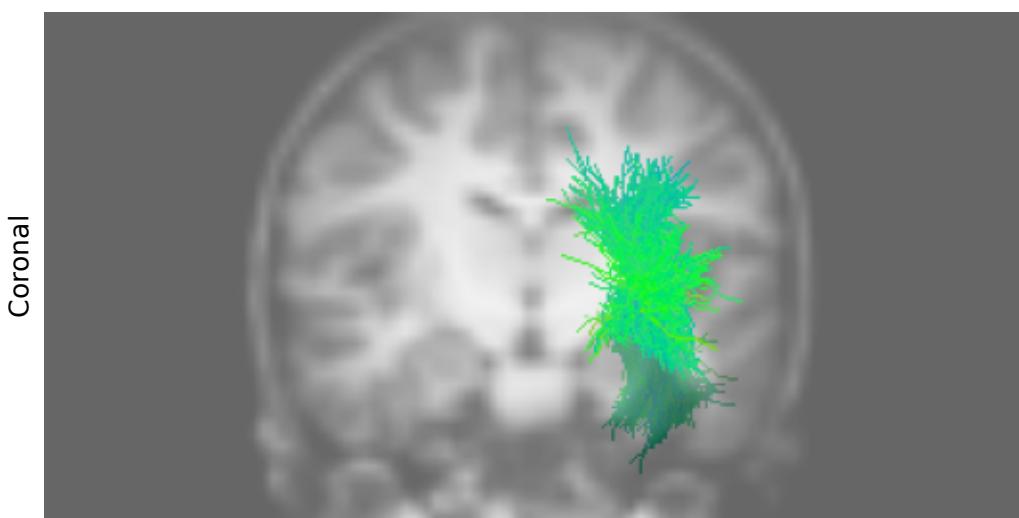
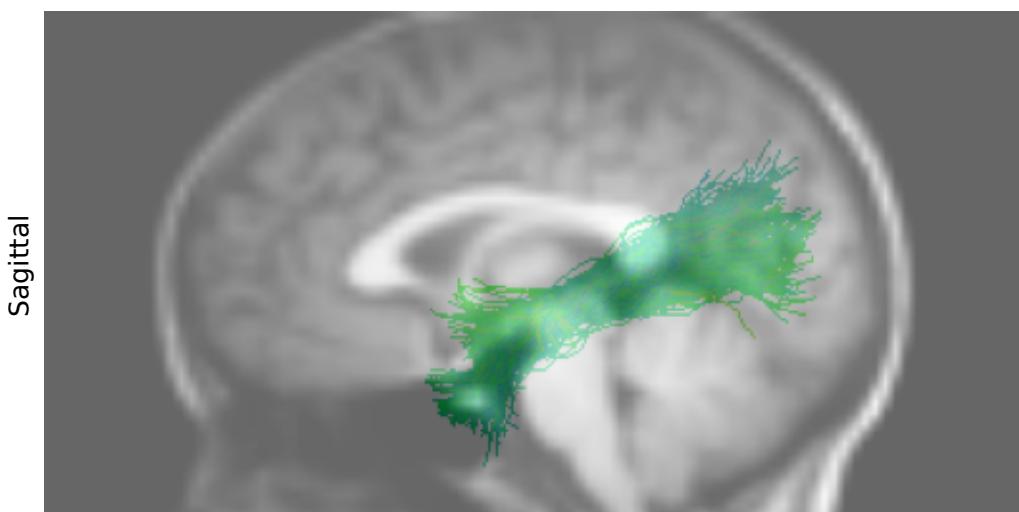
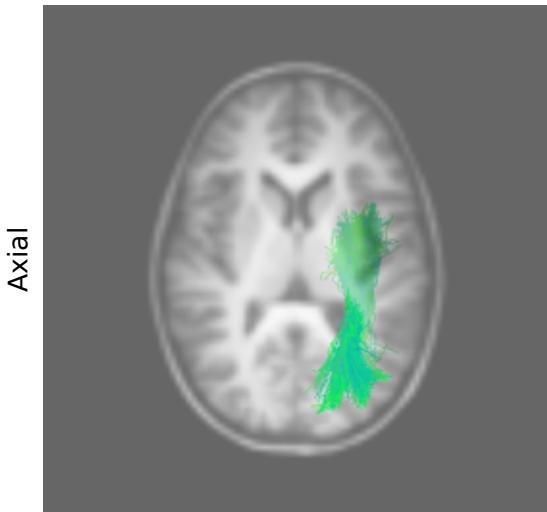
# Spinothalamic Tract - L (STT\_L)



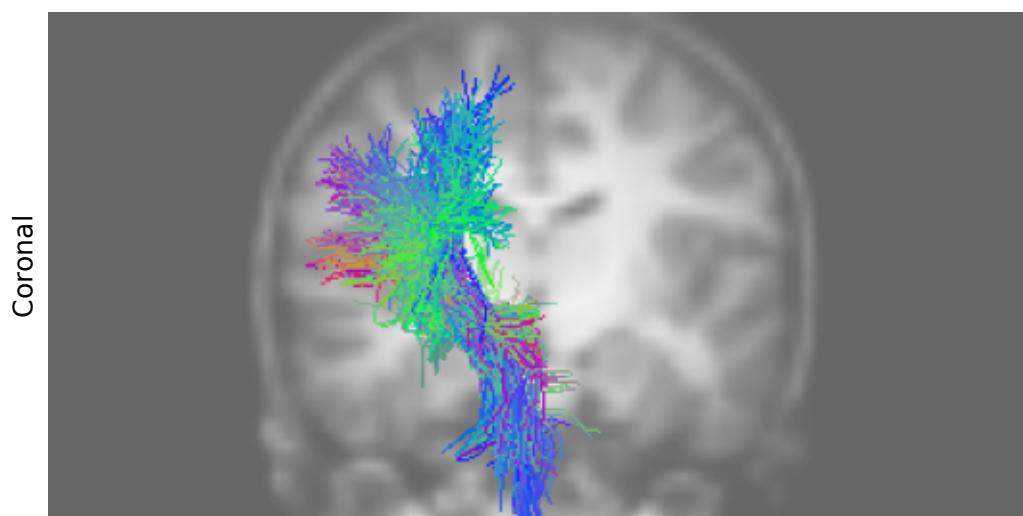
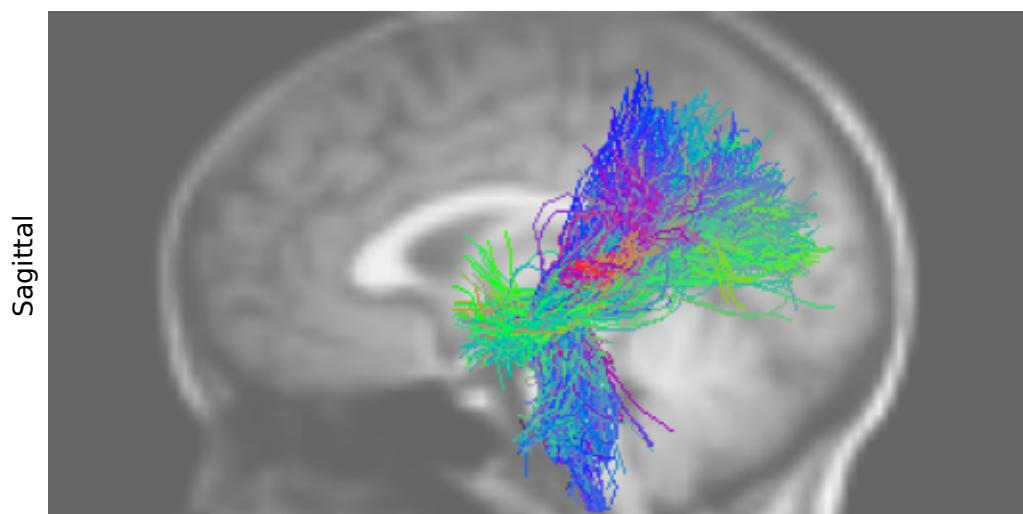
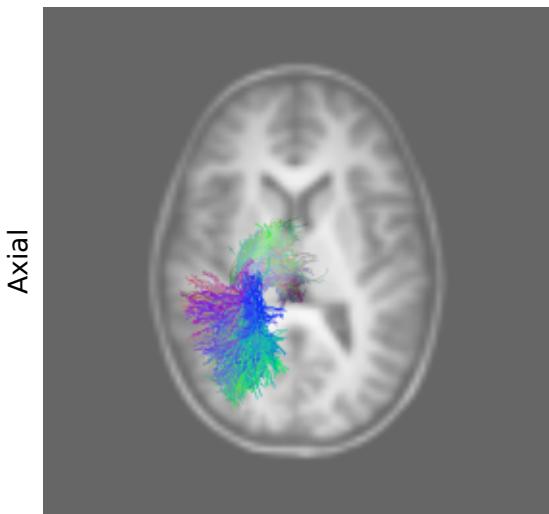
# Spinothalamic Tract - R (STT\_R)



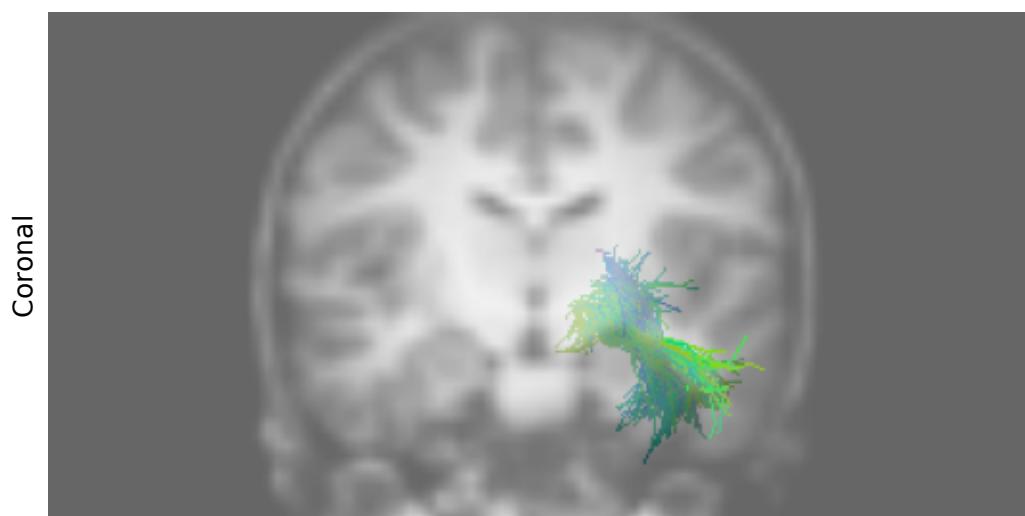
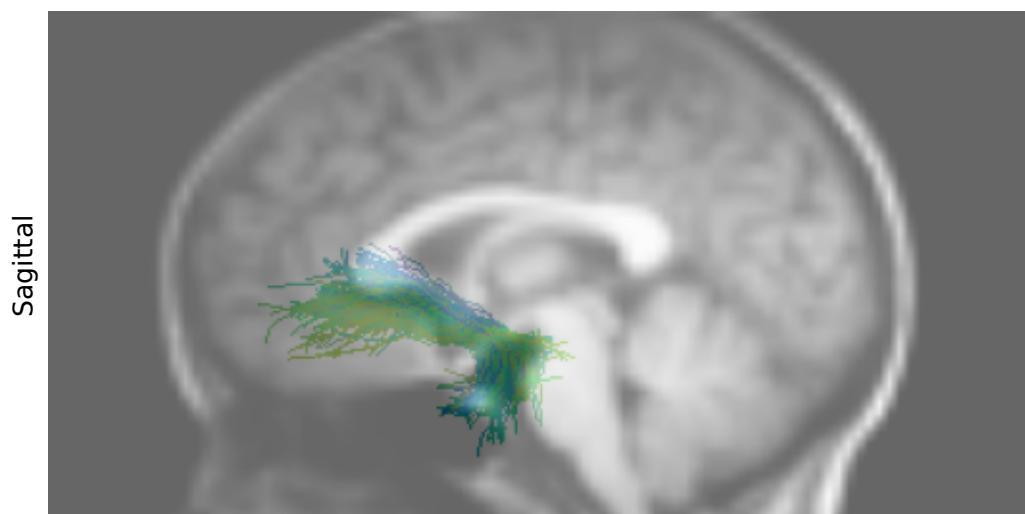
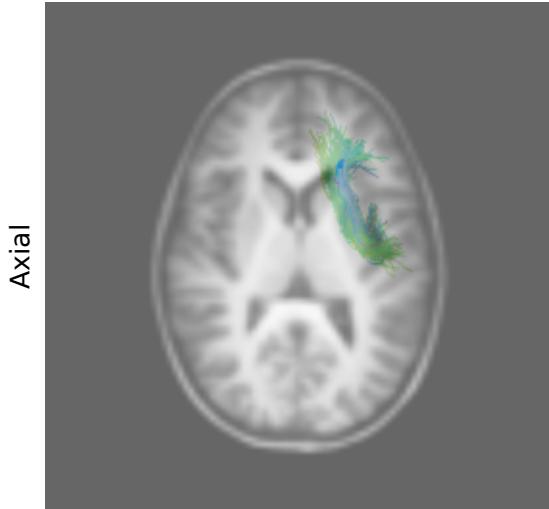
# Temporopontine Tract - L (TPT\_L)



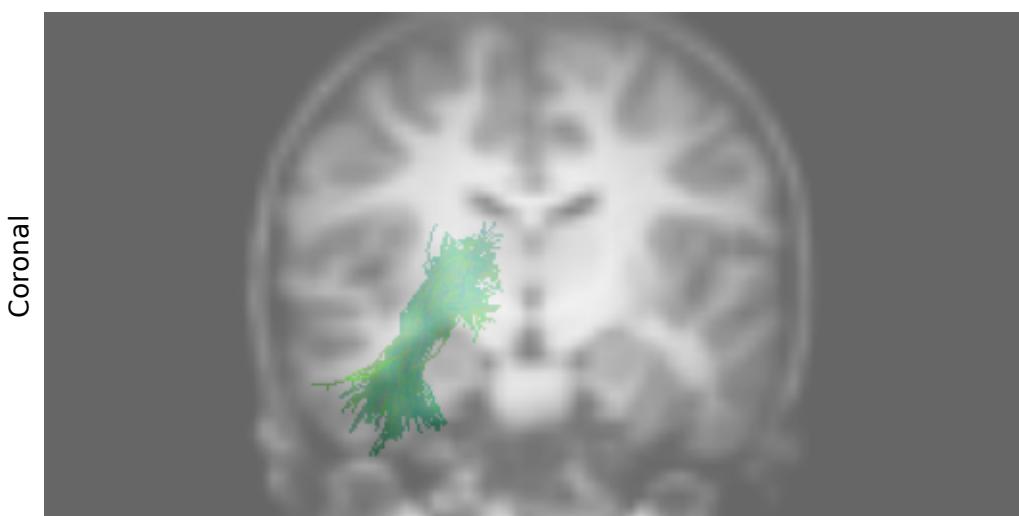
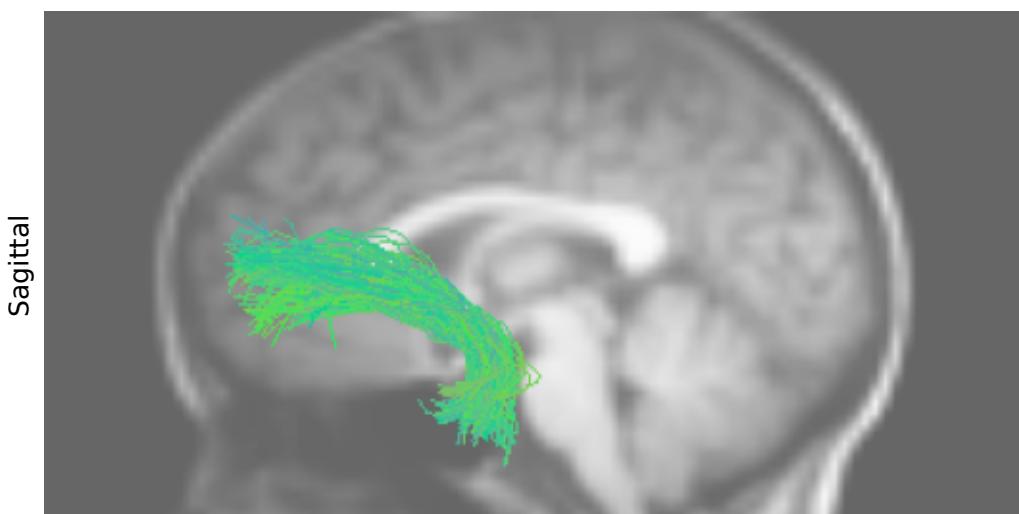
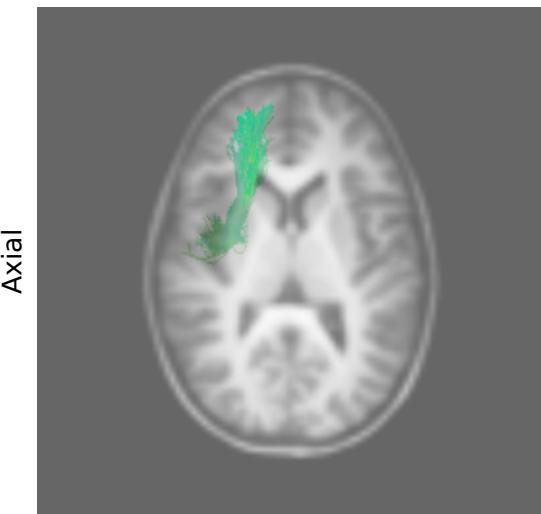
# Temporopontine Tract - R (TPT\_R)



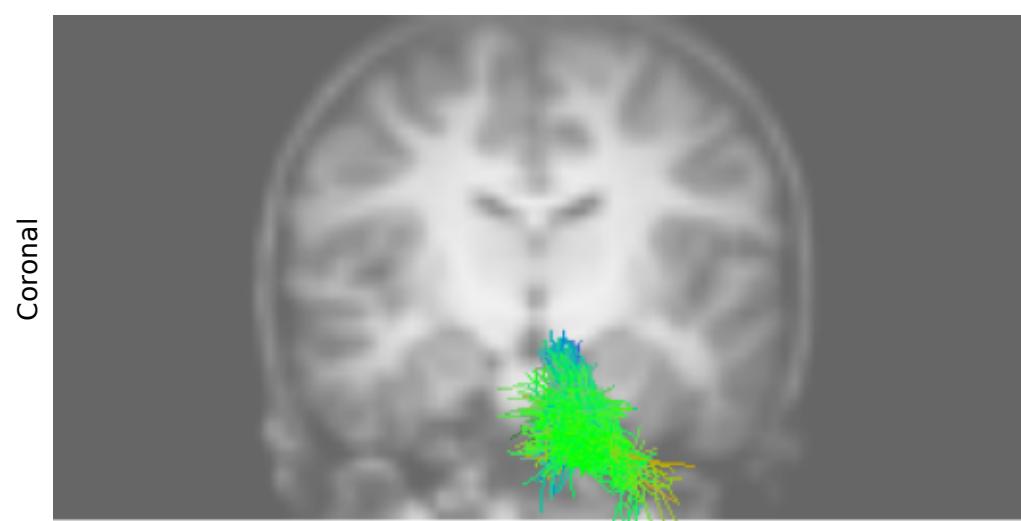
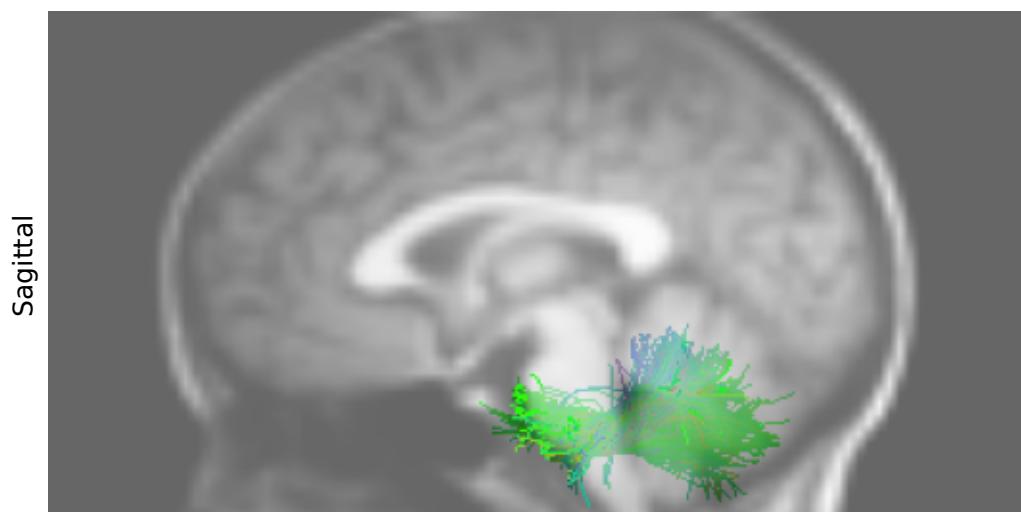
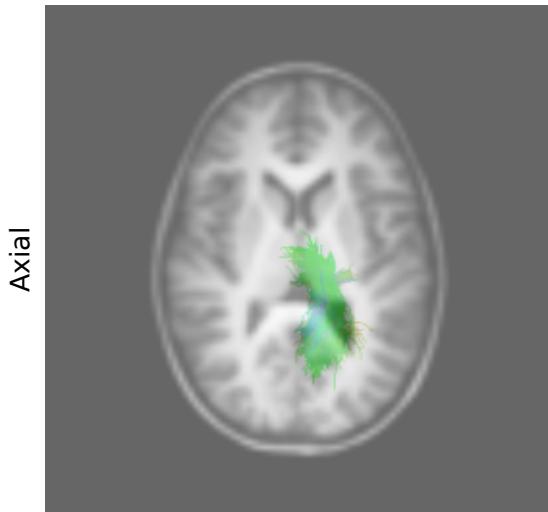
# Uncinate Fasciculus - L (UF\_L)



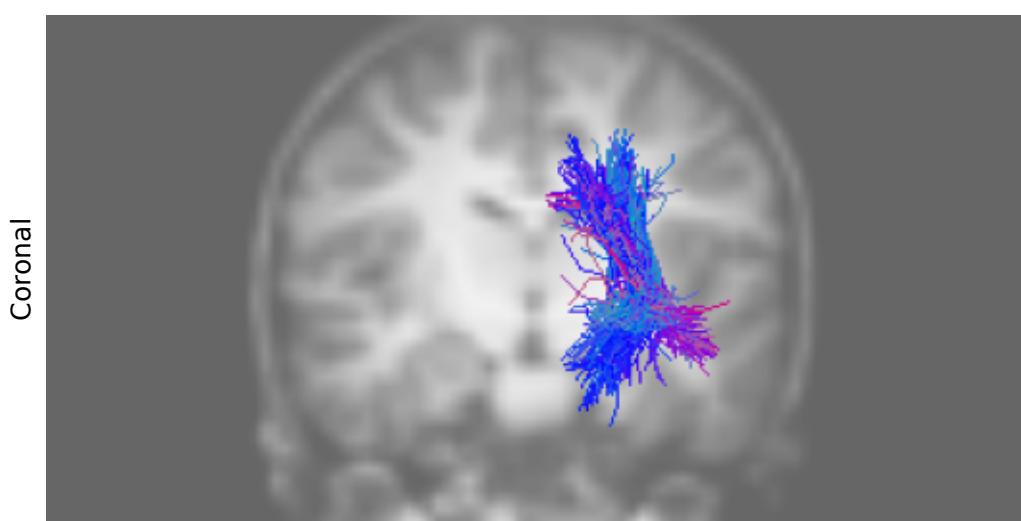
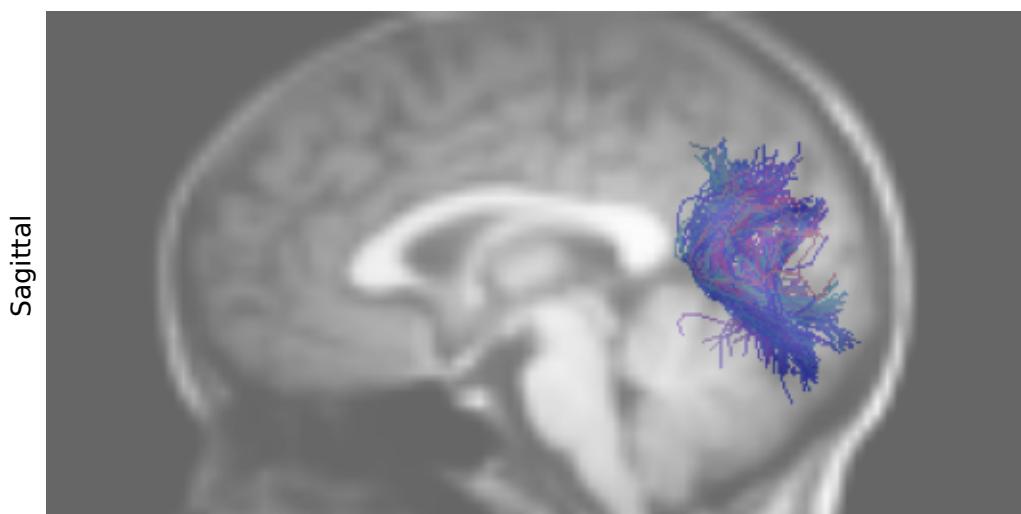
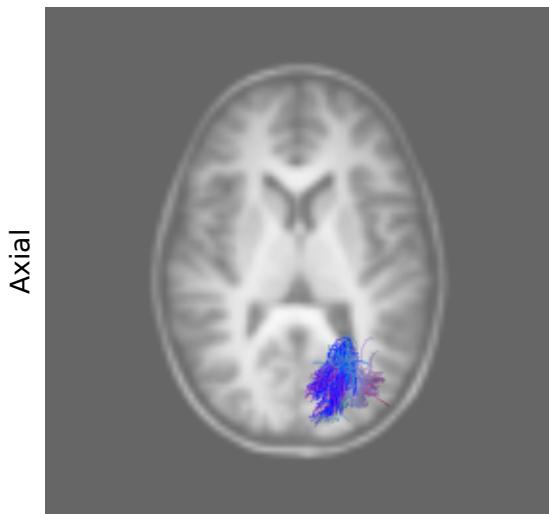
# Uncinate Fasciculus - R (UF\_R)



# Vermis (V)



# Vertical Occipital Fasciculus - L (VOF\_L)



# Vertical Occipital Fasciculus - R (VOF\_R)

