

Supplemental Information

A Comprehensive Wiring Diagram of the Protocerebral Bridge for Visual Information Processing in the *Drosophila* Brain

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Table S1, related to Figure 1- Figure 7

Table S2, related to Figure 2 (*See accompanying Excel spreadsheet*)

Figure S1. CX Structures and Neuron Classification in Previous Studies, Morphology of F neurons and EB rings, Related to Figure 1

(A) Morphology of F neurons. MARCM labeling shows GFP expression (green) in six different types of F neuron with axon terminals projecting to specific FB layers (A1). Brain structures are counterstained with anti-DLG (gray). ID number for each neuron is given for cross-comparison and 3D visualization in the FlyCircuit (<http://www.flycircuit.tw/>). Spatial relationships are illustrated by 3D reconstruction of individual neurons (A2) and integration onto the same standard FB model (transparent gray) after local warping (A3). Colors are randomly assigned to individual neurons.

(B) *Gal4* lines with GFP expression patterns in specific EB rings. *Gal4* lines (names are indicated at the bottom of each figure) are used to define 4 EB rings (B1). Arrows indicate the cell bodies. Scale bar, 20 μ m. Spatial distributions are illustrated by 3D alignment and local warping of different EB expressions onto the same standard EB model. Nomenclature (B2) and spatial relationships (B3) of different EB rings are compared between the current study and a previous study. Schematic coronal section reveals a newly identified posterior (P) ring. Same color represents the same EB ring in 3D model (B1, right column) and schematic coronal section (B3).

(C) Nomenclature comparison of substructures within each of four CX components and two CX accessory regions in different studies.

Figure S2. Characterization of *Gal4* Lines Used in Single Cell Analysis, Related to Figure 2

(A) Innervation regions of *Gal4* lines used for MARCM imaging.

(B) Eight representative *Gal4* lines expressed in PB LNs or PNs. Top: GFP expression patterns (green) and names of *Gal4* lines (bottom). Brain neuropils were immunostained with DLG antibody (magenta). Middle: Innervation patterns represented by 3D segmentation of fibers in different CX regions (indicated by different colors). Bottom: Potential axon-dendrite polarity labeled by Dscam17.1::GFP (green) and Syt::HA (magenta), respectively. Brain structures immunostained with DLG antibody (blue) are demarcated by dashed lines.

(C) Spatial relationships between dendrites (magenta) and axons (green) in EB, IDFP, and FB. In EB_p, VT47318 dendrites intersect with E0330 axons. In EB_c, VT47318 dendrites intersect with E0837 axons (C1). In IDFP_{HB-lateral}, VT38817 dendrites intersect with E0837 axons (C2). In FB_{d,e,f}, dendrites in VT27015 and E0837 intersect with E0330 axons (C3). Brain structures immunostained with DLG antibody (blue) are demarcated by dashed lines.

(D) Nomenclature principles. We applied a modular naming system for single neuron

data. For example, in the group called superclass, the first character indicates the dendrite position, the last character indicates the axon position, and the middle character represents either dendrites or axons.

(E) Morphological characterization of 141 single PB neurons. Each row shows 3D reconstruction, innervation pattern, and nomenclature of a representative neuron. Number of imaged neurons belonging to the same cell type is indicated as n value. Single neurons imaged from MARCM labeling with polarity marker (grey neuropils) are derived from selected PB *Gal4* lines. Single neurons imaged from MARCM labeling without polarity marker (magenta neuropils) are derived from FlyCircuit. (F) Two-cell clones of PB PNs. Neurons are labeled by MARCM (green) Syt::HA indicating axon terminals (magenta). Neuropils are counterstained with anti-DLG (gray). Arrow, cell body. Scale bars, 20 μ m.

Figure S3. EIP Circuits, Related to Figure 4

(A) Innervations pattern of single EIP neurons.
 (B) Proposed EIP circuits showing a model of stereotyped information reverberation among subunits within and between the EB and the PB. §, Neuron innervates PB_{R1,L1}. *, Predicted neuron type.

Figure S4. PEI, PEN, and PFN Circuits, Related to Figure 5

(A) Connectivity scheme of PFN neurons. Since PFN families follow similar projection patterns, we use PB→FB_f—No₄ as an example. Innervation patterns of other PFN neuron are listed in Table S2.
 (B) A list of all types of PEI, PEN, and PFN neurons and their PB innervations. *, Predicted neuron type.

Figure S5. PFI Circuits, Related to Figure 6

(A) Connectivity scheme of PFI neurons. Since PFI families follow similar projection patterns, we use PB—FB_{c,d}→IDFP_{RB} as an example. Innervation patterns of other PFI neuron are listed in Table S2.
 (B) *Gal4* lines contain PB—FB_{c,d}→IDFP_{RB} neurons (VT27015- and VT16698-*Gal4*) or PB—FB→IDFP_{HB-lateral} neurons (VT1979-*Gal4*). Neurons were labeled by *UAS-mCD8::GFP* (green). Brain neuropils were immunostained with DLG antibody (magenta).
 (C) A list of all types of PFI neurons and their PB innervations. §, Neuron innervates PBR1,L1. *, Predicted neuron type. Arrow, PB_{R8} or PB_{L8}. Scale bars, 20 μ m.

Figure S6. Characterization of PB Neurons, Related to Figure 7

(A) Innervation heterogeneity of PB glomeruli. Each of 16 PB glomeruli is innervated by different number and combination of neurons. LNⁱⁿ: local neuron dendrites; LN^{out}: local neuron axons; PNⁱⁿ: projection neuron dendrites; PN^{out}: projection neuron axons. Neurons of undefined polarity are not included.

(B) Identification of putative neurotransmitters in PB neurons. Neurotransmitters of PB neurons in 9 *Gal4* lines are determined with immunostaining using four different antibodies: anti-ChAT (choline acetyltransferase, a marker for cholinergic neuron), anti-GABA (γ -aminobutyric acid, a marker for GABAergic neuron), anti-5-HT (5-hydroxytryptamine, a marker for serotonergic neuron), anti-TH (tyrosine hydroxylase, a marker for dopaminergic neuron). (B1) VT34814-*Gal4* contains some, but not all, cholinergic (arrow) PB LNs. These non-cholinergic neurons (arrowhead) are also immunonegative for anti-GABA, anti-5-HT, and anti-TH. (B2) PB LNs in VT30297-*Gal4* are all immunonegative for anti-ChAT, anti-GABA, anti-5-HT, and anti-TH. (B3) Paired CVP neurons in VT38817-*Gal4* are dopaminergic. (B4–B6) CVP, EIP, PEN, and PFN neurons are cholinergic. (B7) VT27015-*Gal4* contains some, but not all, cholinergic (arrow) PFI neurons. These non-cholinergic neurons (arrowhead) are also immunonegative for anti-GABA, anti-5-HT, and anti-TH. (B8) PEI and PFI neurons in E0837-*Gal4* are cholinergic. Insets, single optical section indicating colocalization between GFP (green) and immunopositive signals (magenta) in the cell bodies. Scale bars, 20 μ m.

(C) Morphological homology of PB neurons. Green characters indicate dendritic, magenta indicates axonal, and blue characters a mixing of both. Arrows indicate the direction of information flow. Neurons that are highly polarization-sensitive are defined as POL. “Conditional” POL means the neuron shows only 50% polarization sensitivity. Abbreviations: sml fld, small field neuron; lar fld, large field neuron; PBL, protocerebral bridge lateral neuron; PB, protocerebral bridge; EB, ellipsoid body; FB, fan-shaped body; No, noduli; IDFP, inferior dorsofrontal protocerebrum; LAL, lateral accessory lobe; CBU, upper division of the central body (FB-like); CBL, lower division of the central body (EB-like); POTu, posterior optic tubercle. N.D., not detected.

¹PB LNs have been identified by anti-vesicular glutamate transporter (VGlut) antibody (Daniels et al., 2008).

²Heinze and Homberg, 2009.

³Heinze et al., 2009.

⁴Heinze and Homberg, 2007.

(D) A list of CX specific *Gal4* lines. For abbreviations, see Table S1 and legend of Figure S1B. *, undesignated ring neurons.

SUPPLEMENTAL MOVIES

Movie S1. A 3D Model of the CX, Related to Figure 1

Segmentation and volume rendering of CX subunits. Color coding for each subunit is the same as in Figure 1B. Neuropils (gray) were immunostained with DLG antibody.

Movie S2. Morphology of Single PB Neurons, Related to Figure 2

Innervation patterns of 17 distinct types of PB neuron (green) with axon terminals marked by Syt::HA (magenta) in relation to CX subunits (grey).

Movie S3. Wiring Principles of CVP and EIP Neurons, Related to Figure 4

The video demonstrates mirror symmetrical, convergent, and tiling wiring principles in CVP and EIP neurons. Neurons are color coded as in Figures 4D–4G.

Movie S4. Wiring Principles of PEI, PEN, and PFN Neurons, Related to Figure 5

The video demonstrates mirror symmetrical, convergent, and divergent wiring principles in PEI, PEN, and PFN neurons. Neurons are color coded as in Figures 5D, 5F, 5H, 5J, and 5K.

Movie S5. Wiring Principles of PFI Neurons, Related to Figure 6

The video demonstrates mirror symmetrical, tiling, and integration wiring principles in PFI neurons. Neurons are color coded as in Figures 6B–6D.

Movie S6. Visualization of hundreds of PB neurons, Related to Figure 7

Skeleton tracing and visualization of hundred of PB neurons (color) in standard model brain (gray). Colors were randomly assigned to individual neurons.

SUPPLEMENTAL TABLES

Table S1. Abbreviations List, Related to Figure

Table S2. List of PB Neuron *Gal4* Lines and Cell Types, Related to Figure 2

(See accompanying Excel spreadsheet)

(A) Classification of 526 single PB neurons labeled with mCD8::GFP identified from FlyCircuit database. Images showed in Figure S2C.

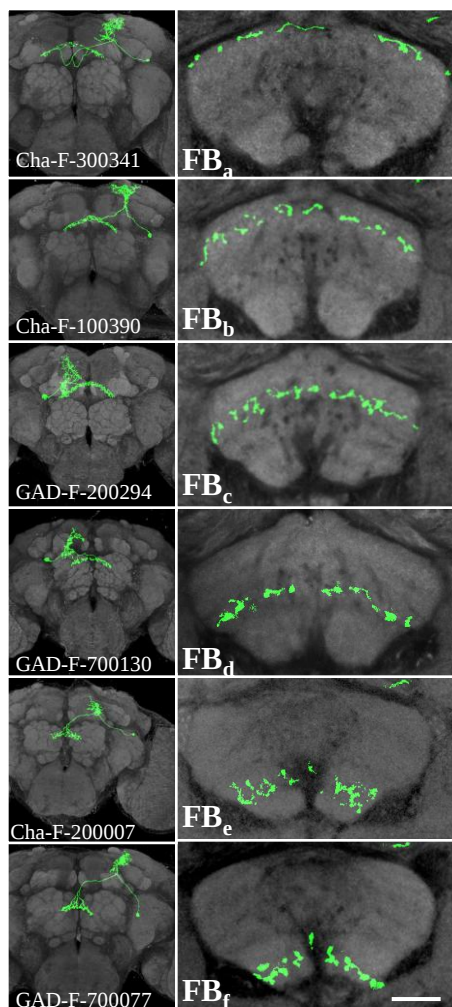
(B) Polarity characterization of 8 PB neuron *Gal4* lines expressed in LNs or PNs. Potential axon-dendrite polarity labeled by Dscam17.1::GFP and Syt::HA, and neuropils counterstained with DLG respectively. Images showed in Figure S2B.

(C) Classification of 136 single PB neurons isolated from specific PB *Gal4* lines labeled with mCD8::GFP and an additional Syt::HA marker. Images showed in Figure

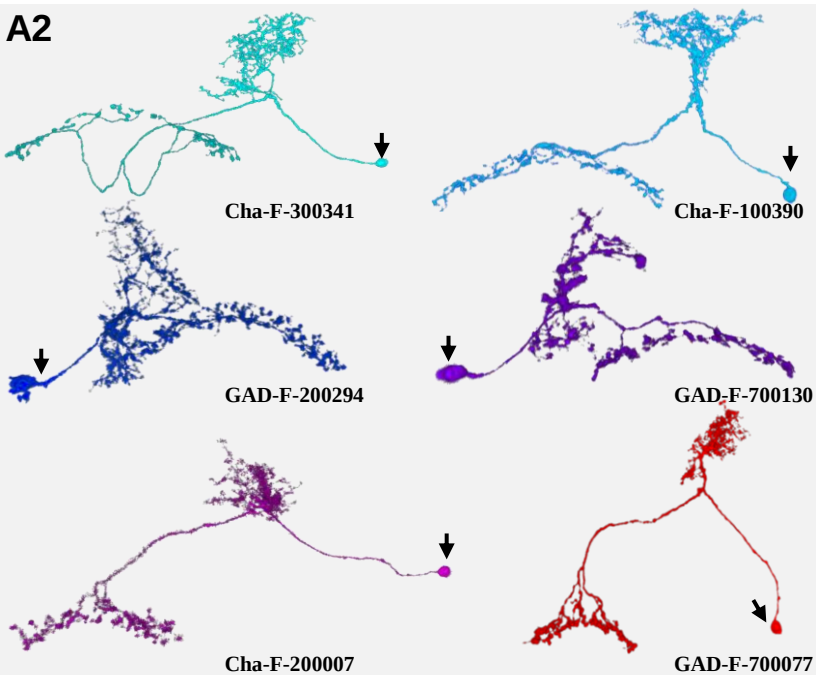
S2C.

(D) Integration and classification of total 662 single PB neurons isolated from PB *Gal4* lines and FlyCircuit database. Neurons are identified from FlyCircuit database (black) and PB *Gal4* lines (yellow).

(E) Polarity and innervations pattern of specific cell types. Numbers of cell type are determined from both real data (black) and predicted data (magenta). Predictions are based on wiring principles deduced from real data.

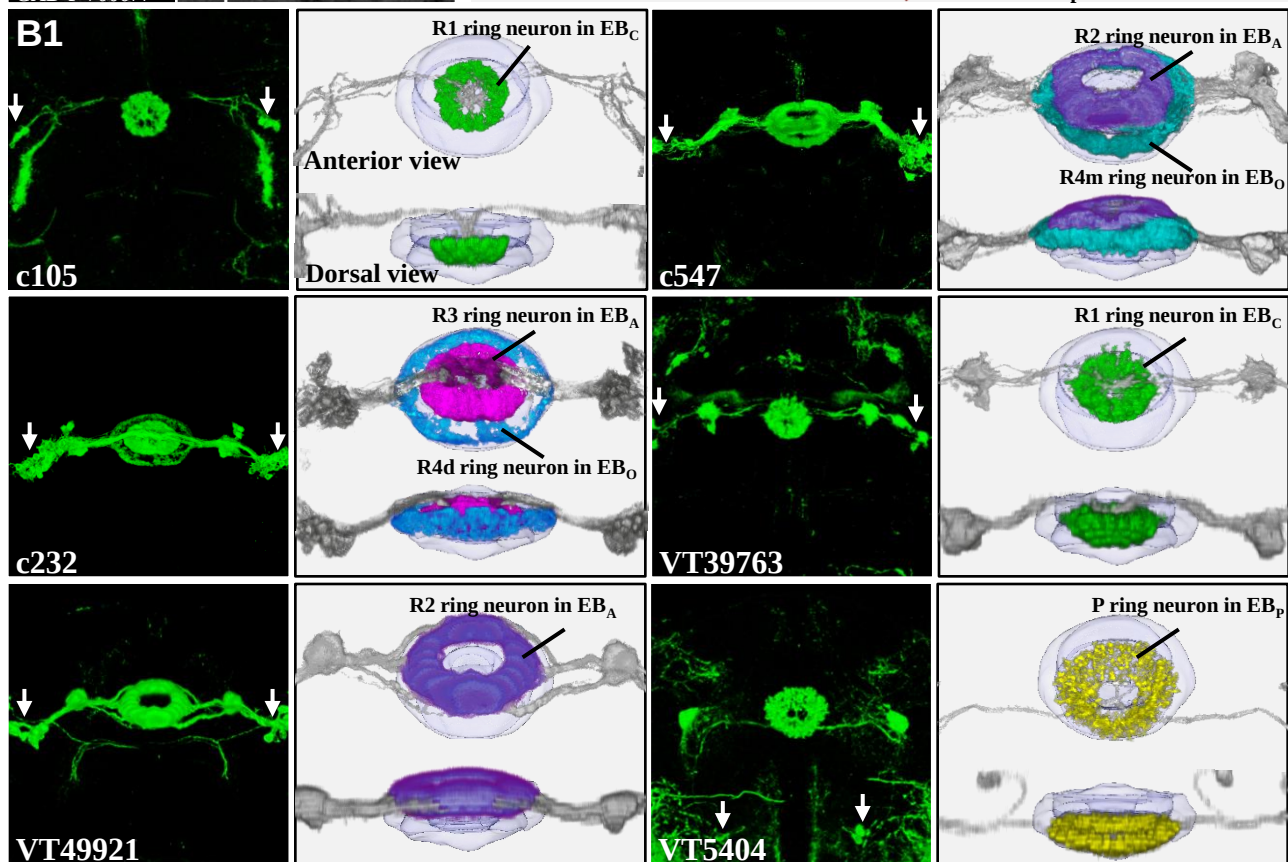
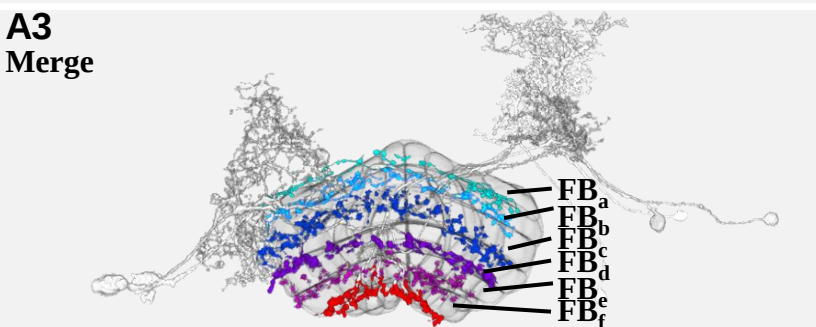


A2



A3

Merge



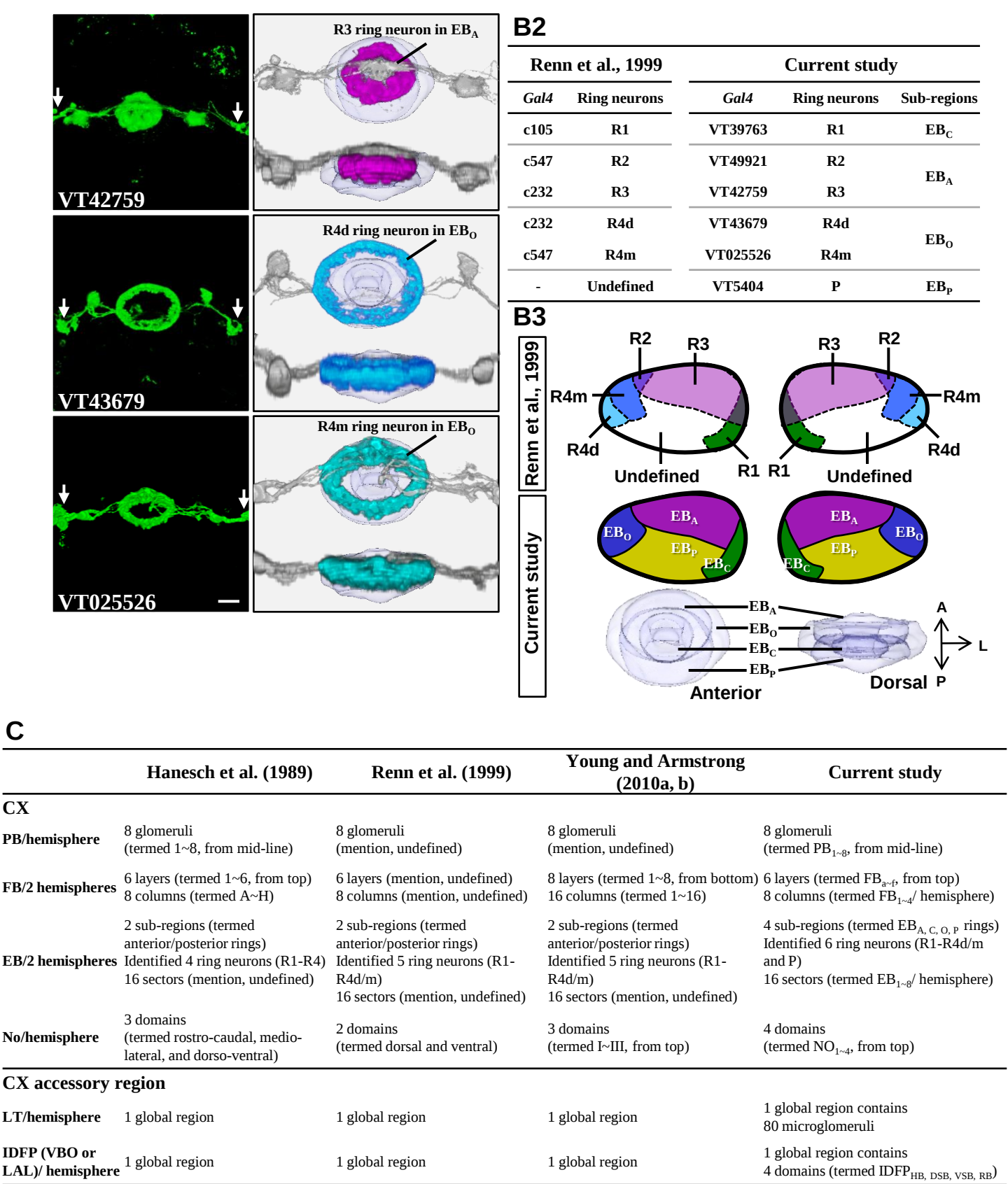
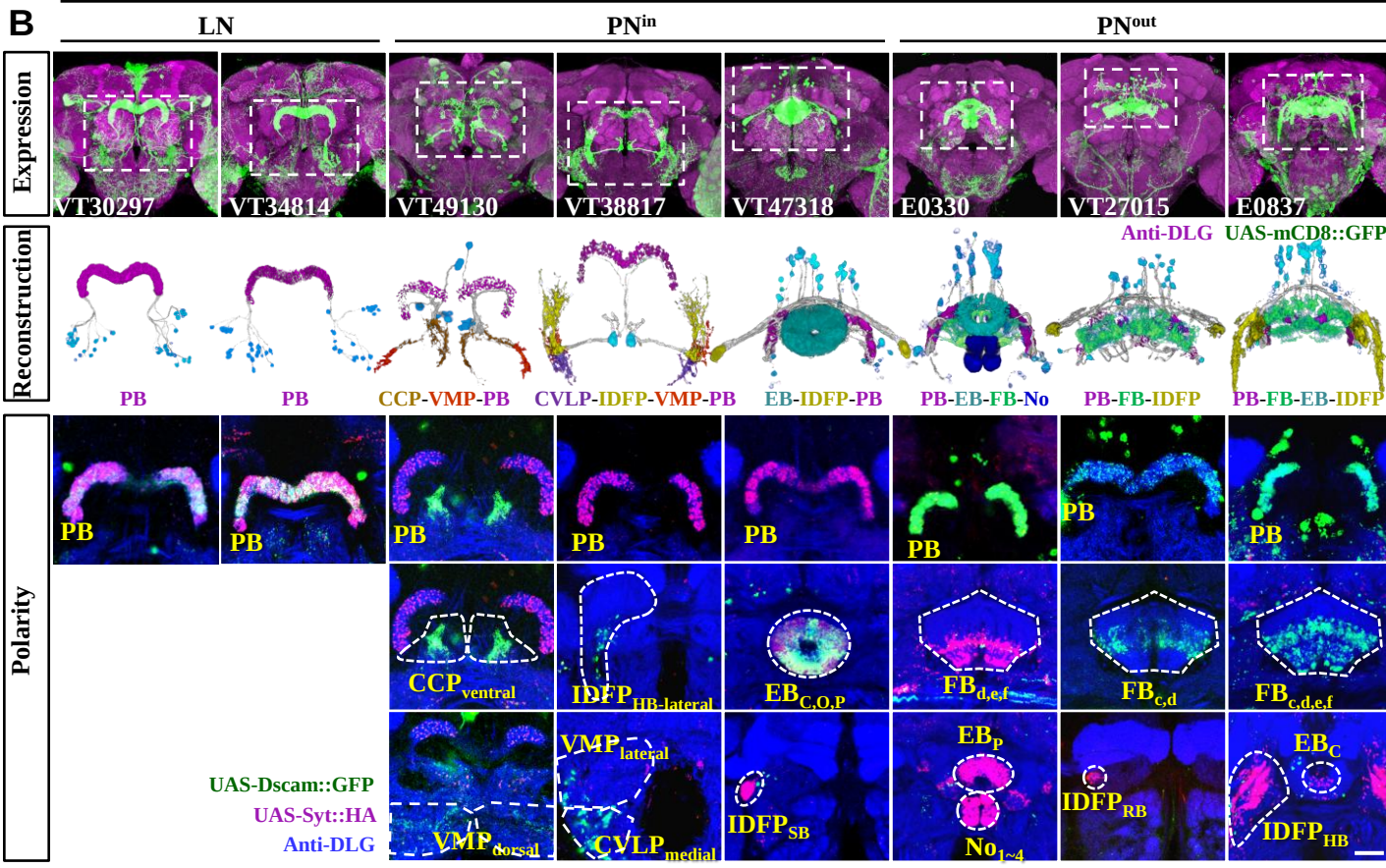
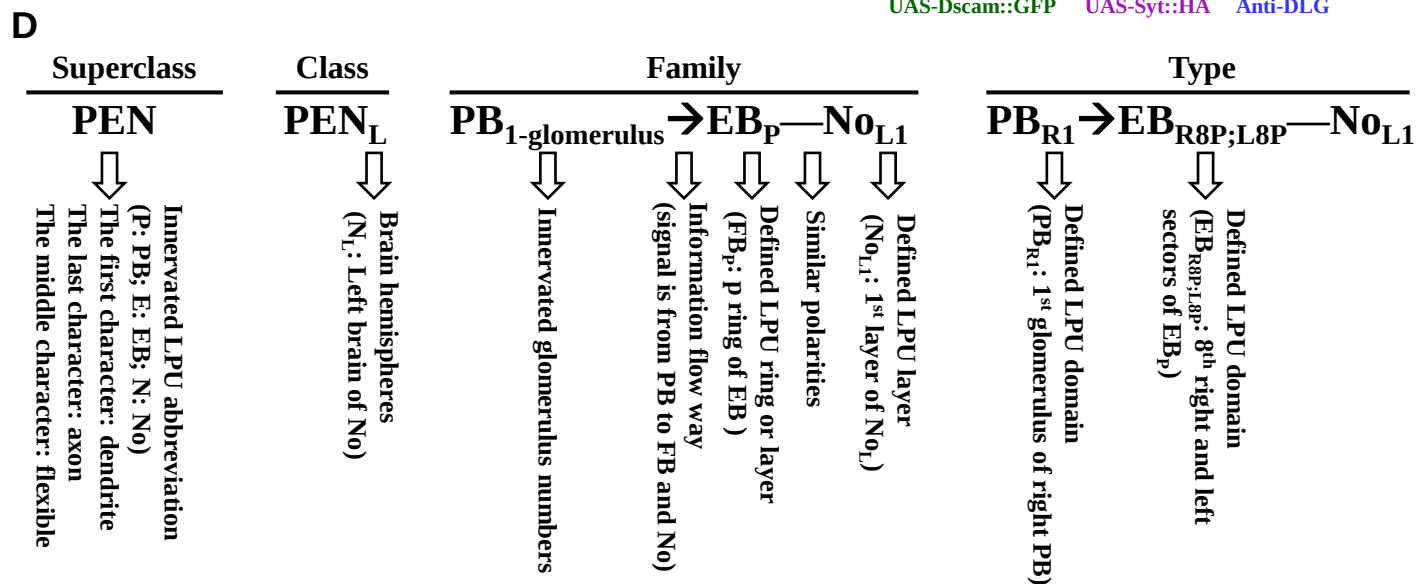
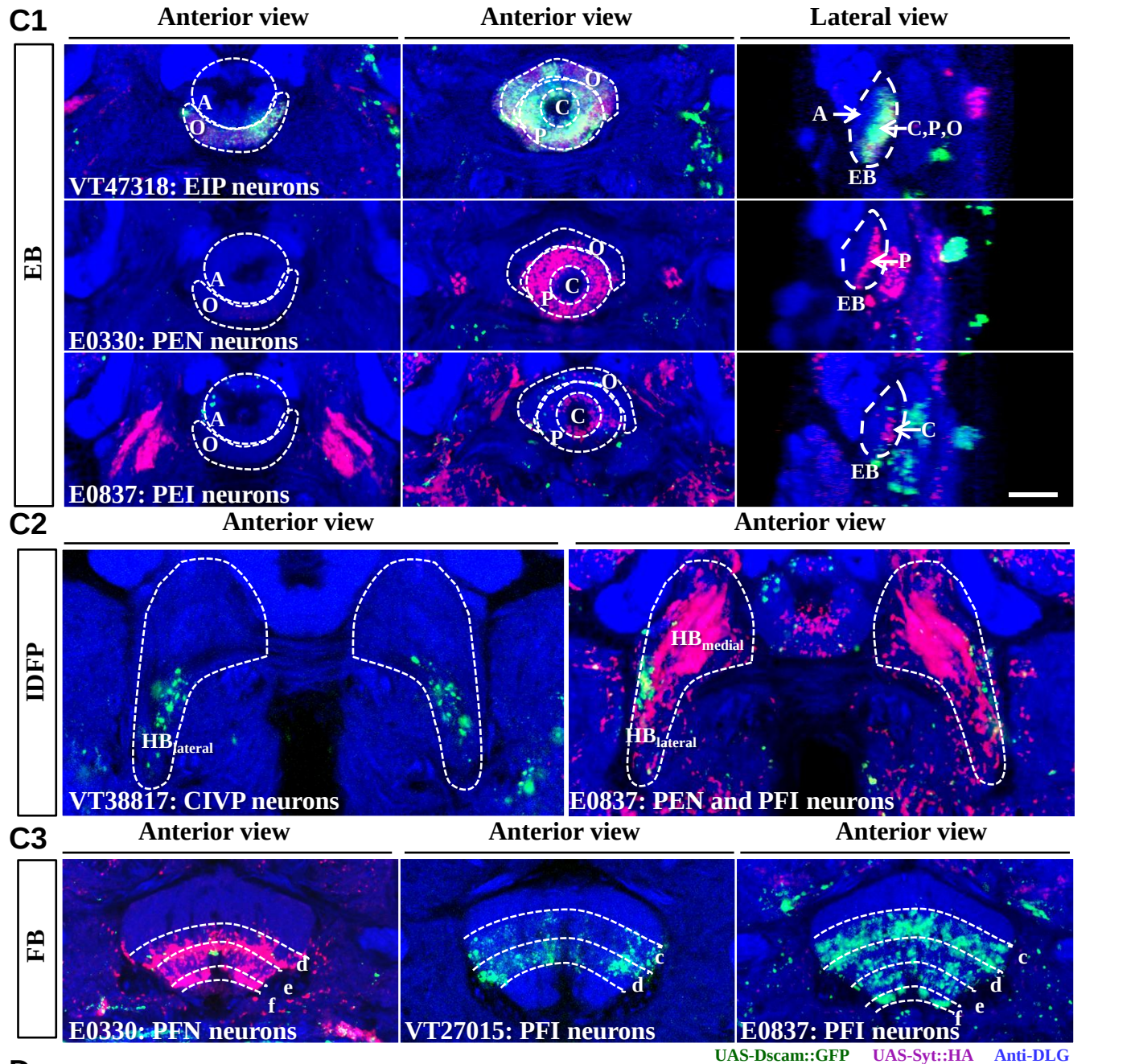


Figure S1. CX Structures and Neuron Classification in Previous Studies, Morphology of F neurons and EB rings, Related to Figure 1

A	Driver	Superclass	Class	Family
VT30297	PB/ neurons* (PB LNs)		PB LN	PB ₆ -glomeruli PB ₁₅ -glomeruli PB ₁₆ -glomeruli
VT49130	ccp-vmp-pb neurons (CVP neurons)	C _L V _L P C _R V _R P		CCP _{L-ventral} —VMP _{L-dorsal} →PB ₂ -glomeruli CCP _{R-ventral} —VMP _{R-dorsal} →PB ₂ -glomeruli
VT38817	cvlp-idfp-vmp-pb neurons (CIVP neurons)	C _L I _L V _L P C _R I _R V _R P		CVLP _{L-medial} —IDFP _{L-HB} —VMP _{L-lateral} →PB ₁₆ -glomeruli CVLP _{R-medial} —IDFP _{R-HB} —VMP _{R-lateral} →PB ₁₆ -glomeruli
VT47318	eb-pb-vbo neurons* (EIP neurons)	EI _L P EI _R P		EB _{C,O,P} →EB _{C,O,P} —IDFP _{L-DSB} —PB ₂ -glomeruli EB _{C,O,P} →EB _{C,O,P} —IDFP _{L-DSB} —PB ₁ -glomerulus EB _{C,O,P} →EB _{C,O,P} —IDFP _{L-VSB} —PB ₁ -glomerulus EB _{C,P} →EB _{C,P} —IDFP _{L-DSB} —PB ₁ -glomerulus EB _{C,O,P} →EB _{C,O,P} —IDFP _{R-DSB} —PB ₂ -glomeruli EB _{C,O,P} →EB _{C,O,P} —IDFP _{R-DSB} —PB ₁ -glomerulus EB _{C,O,P} →EB _{C,O,P} —IDFP _{R-VSB} —PB ₁ -glomerulus EB _{C,P} →EB _{C,P} —IDFP _{R-DSB} —PB ₁ -glomerulus
E0330	pb-eb-no neurons* (PEN neurons) pb-fb-vbo neurons* (PFN neurons)	PEN _L PEN _R PFN _L PFN _R		PB ₁ -glomerulus→EB _p —No _{L1} PB ₁ -glomerulus→EB _p —No _{R1} PB ₁ -glomerulus→FB _d —No _{L2} PB ₁ -glomerulus→FB _e —No _{L3} PB ₁ -glomerulus→FB _f —No _{L4} PB ₁ -glomerulus→FB _d —No _{R2} PB ₁ -glomerulus→FB _e —No _{R3} PB ₁ -glomerulus→FB _f —No _{R4}
VT27015	pb-fb-vbo neurons* (PFI neurons)	PFI _L PFI _R		PB ₁ -glomerulus—FB _{C,d} →IDFP _{L-RB} PB ₁ -glomerulus—FB _{C,d} →IDFP _{R-RB}
E0837	pb-eb-idfp neurons (PEI neurons) pb-fb-vbo neurons* (PFI neurons)	PEI _L PEI _R PFI _L PFI _R PFI _{L+R}		PB ₁ -glomerulus→EB _C —IDFP _{L-DSB} PB ₁ -glomerulus→EB _C —IDFP _{R-DSB} PB ₂ -glomeruli—FB _e →IDFP _{L-HB-lateral} PB ₁ -glomerulus—FB _e →IDFP _{L-HB-lateral} PB ₂ -glomeruli—FB _{C,d,e,f} →IDFP _{L-HB-medial} PB ₁ -glomerulus—FB _{C,d,e,f} →IDFP _{L-HB-medial} PB ₂ -glomeruli—FB _e →IDFP _{R-HB-lateral} PB ₁ -glomerulus—FB _e →IDFP _{R-HB-lateral} PB ₂ -glomeruli—FB _{C,d,e,f} →IDFP _{R-HB-medial} PB ₁ -glomerulus—FB _{C,d,e,f} →IDFP _{R-HB-medial} PB ₁ -glomerulus—FB _{C,d,e,f} →IDFP _{L+R-HB-medial}



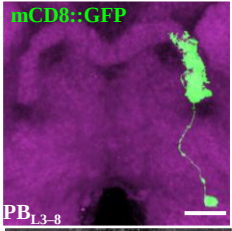
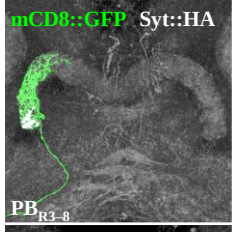
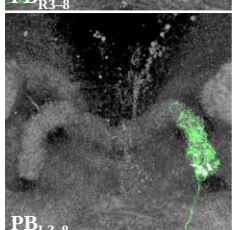


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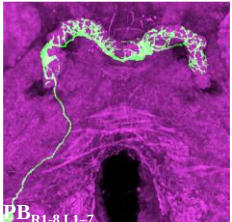
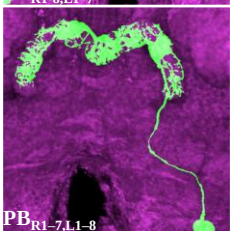
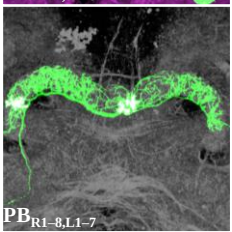
Superclass: PB LN neurons

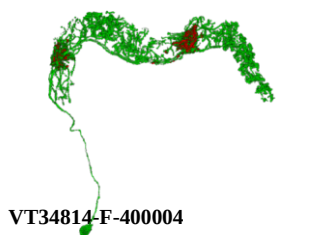
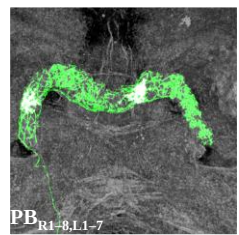
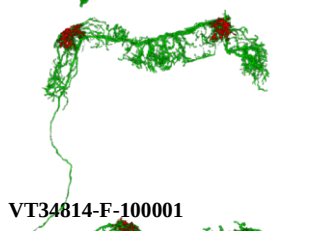
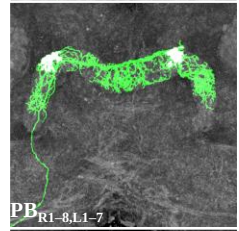
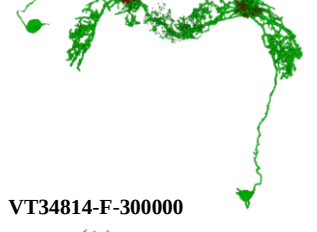
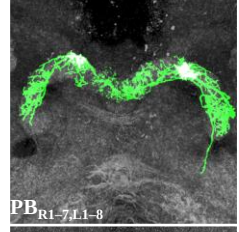
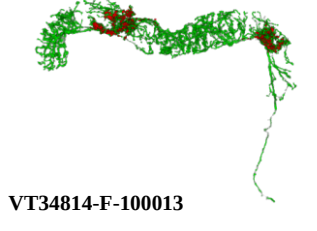
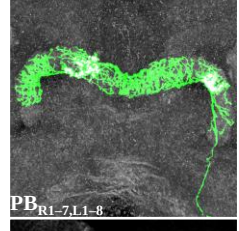
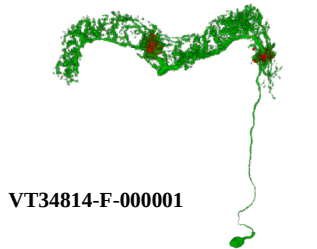
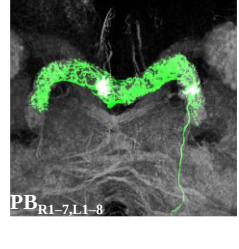
Class: PB LN neurons

Family: PB₆-glomeruli

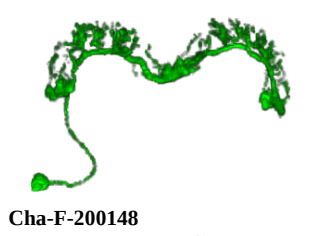
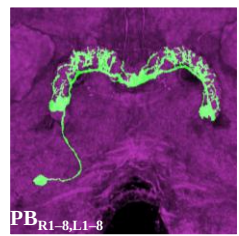
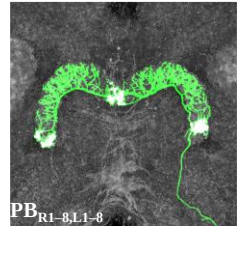
3D reconstruction	Innervation	Type (n value)
mCD8::GFP 	mCD8::GFP  PB_{L3-8}	PB _{L3-8} glomeruli (n=1)
Cha-F-200392 mCD8::GFP Syt::HA 	mCD8::GFP Syt::HA  PB_{R3-8}	PB _{R3-8} glomeruli; axon: R7,R8 (n=7)
VT34814-F-300003 	 PB_{L3-8}	PB _{L3-8} glomeruli; axon: L7,L8 (n=6)
VT34814-F-600000 		

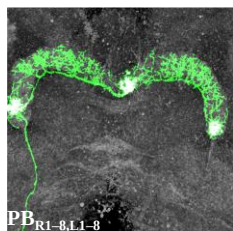
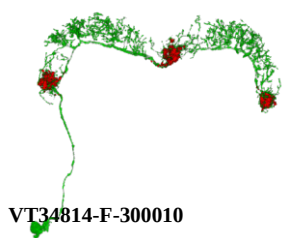
Family: PB₁₅-glomeruli

Cha-F-300196 	PB_{R1-8,L1-7} 	PB _{R1-8,L1-7} glomeruli (n=30)
Cha-F-100415 	PB_{R1-7,L1-8} 	PB _{R1-7,L1-8} glomeruli (n=24)
VT34814-F-400003 	PB_{R1-8,L1-7} 	PB _{R1-8,L1-7} glomeruli; axon: R6,L1 (n=6)

 VT34814-F-400004	 PB_{R1-8,L1-7}	PB_{R1-8,L1-7} glomeruli; axon: R5,L2 (n=3)
 VT34814-F-100001	 PB_{R1-8,L1-7}	PB_{R1-8,L1-7} glomeruli; axon: R4,L3 (n=8)
 VT34814-F-300000	 PB_{R1-7,L1-8}	PB_{R1-7,L1-8} glomeruli; axon: R3,L4 (n=5)
 VT34814-F-100013	 PB_{R1-7,L1-8}	PB_{R1-7,L1-8} glomeruli; axon: R2,L5 (n=2)
 VT34814-F-000001	 PB_{R1-7,L1-8}	PB_{R1-7,L1-8} glomeruli; axon: R1,L6 (n=6)

Family: PB₁₆-glomeruli

 Cha-F-200148	 PB_{R1-8,L1-8}	PB_{R1-8,L1-8} glomeruli (n=15)
 VT34814-F-100008	 PB_{R1-8,L1-8}	PB_{R1-8,L1-8} glomeruli; axon: R8,R1,L7 (n=7)



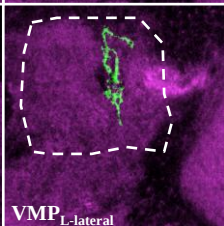
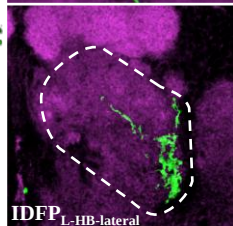
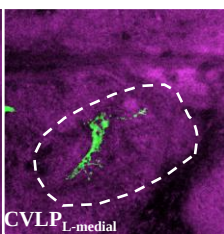
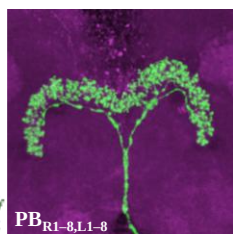
PB_{R1-8,L1-8} glomeruli; axon: R7,L1,L8 (n=15)

E2

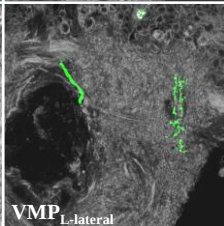
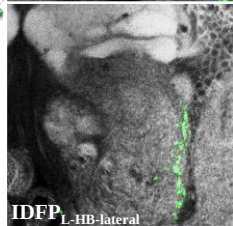
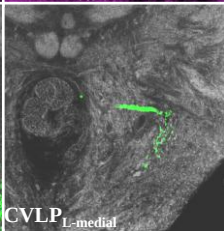
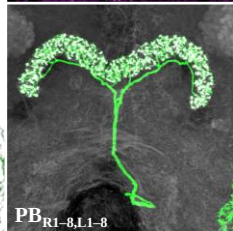
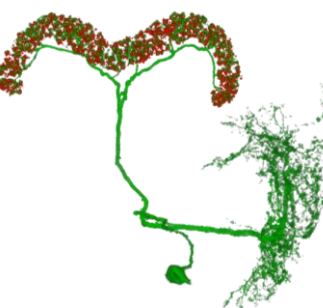
Superclass: CIVP neurons

Class: C_LV_LP neurons

Family: CVLP_{L-medial}—IDFP_{L-HB-lateral}—VMP_{L-lateral}→PB_{16-glomeruli}



CVLP_{L-medial}—IDFP_{L-HB-lateral}—
VMP_{L-lateral}→PB_{R1-8,L1-8} (n=2)



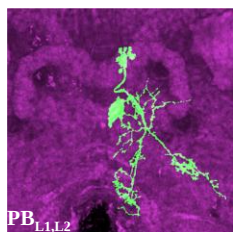
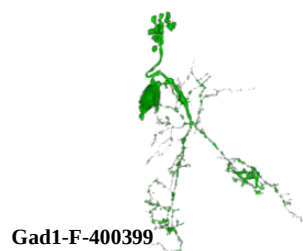
CVLP_{L-medial}—IDFP_{L-HB-lateral}—
VMP_{L-lateral}→PB_{R1-8,L1-8} (n=1)

E3

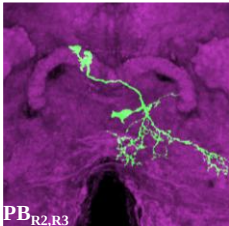
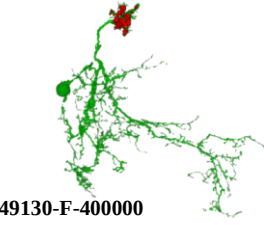
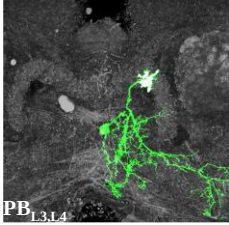
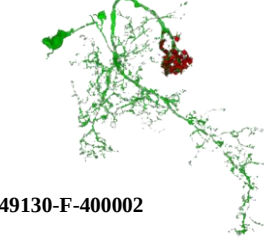
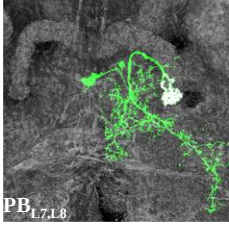
Superclass: CVP neurons

Class: C_LV_LP neurons

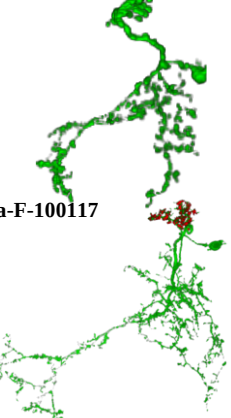
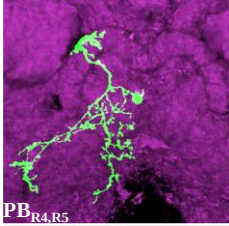
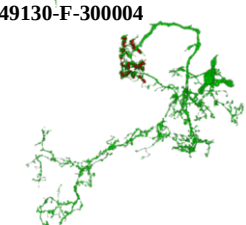
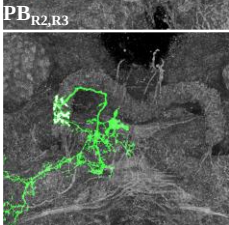
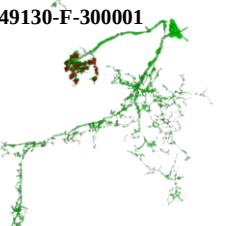
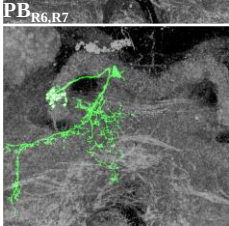
Family: CCP_{L-ventral}—VMP_{L-dorsal}→PB_{2-glomeruli}



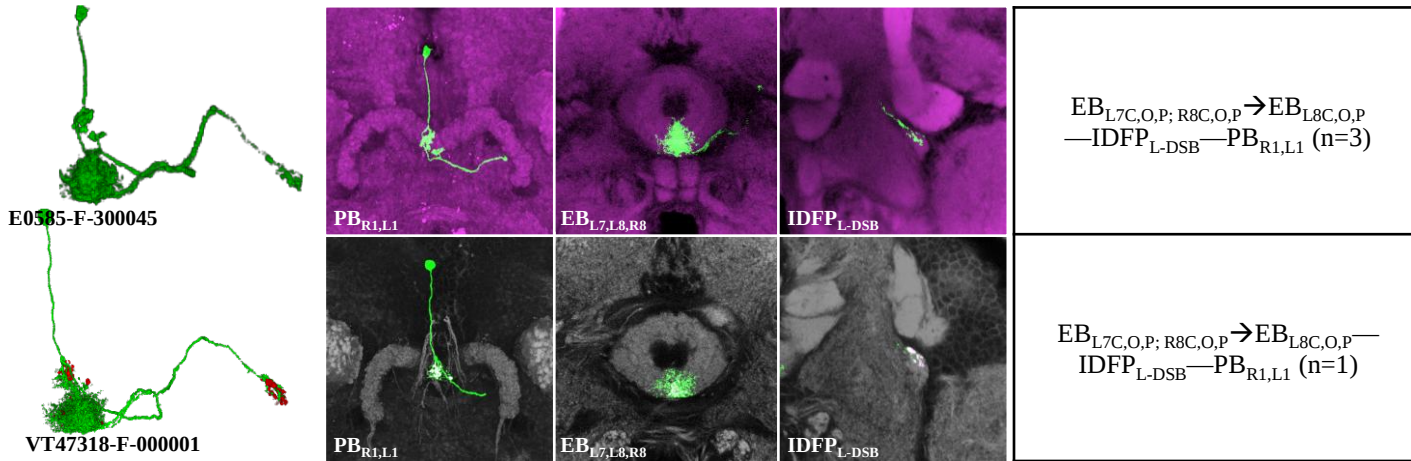
CCP_{L-ventral}—VMP_{L-dorsal}→PB_{L1,L2}
(n=1)

 Cha-F-000050	 PB_{R2,R3}	$CCP_{L-ventral} \text{---} VMP_{L-dorsal} \rightarrow PB_{R2,R3}$ (n=1)
 VT49130-F-400000	 PB_{L3,L4}	$CCP_{L-ventral} \text{---} VMP_{L-dorsal} \rightarrow PB_{L3,L4}$ (n=2)
 VT49130-F-400002	 PB_{L7,L8}	$CCP_{L-ventral} \text{---} VMP_{L-dorsal} \rightarrow PB_{L7,L8}$ (n=1)

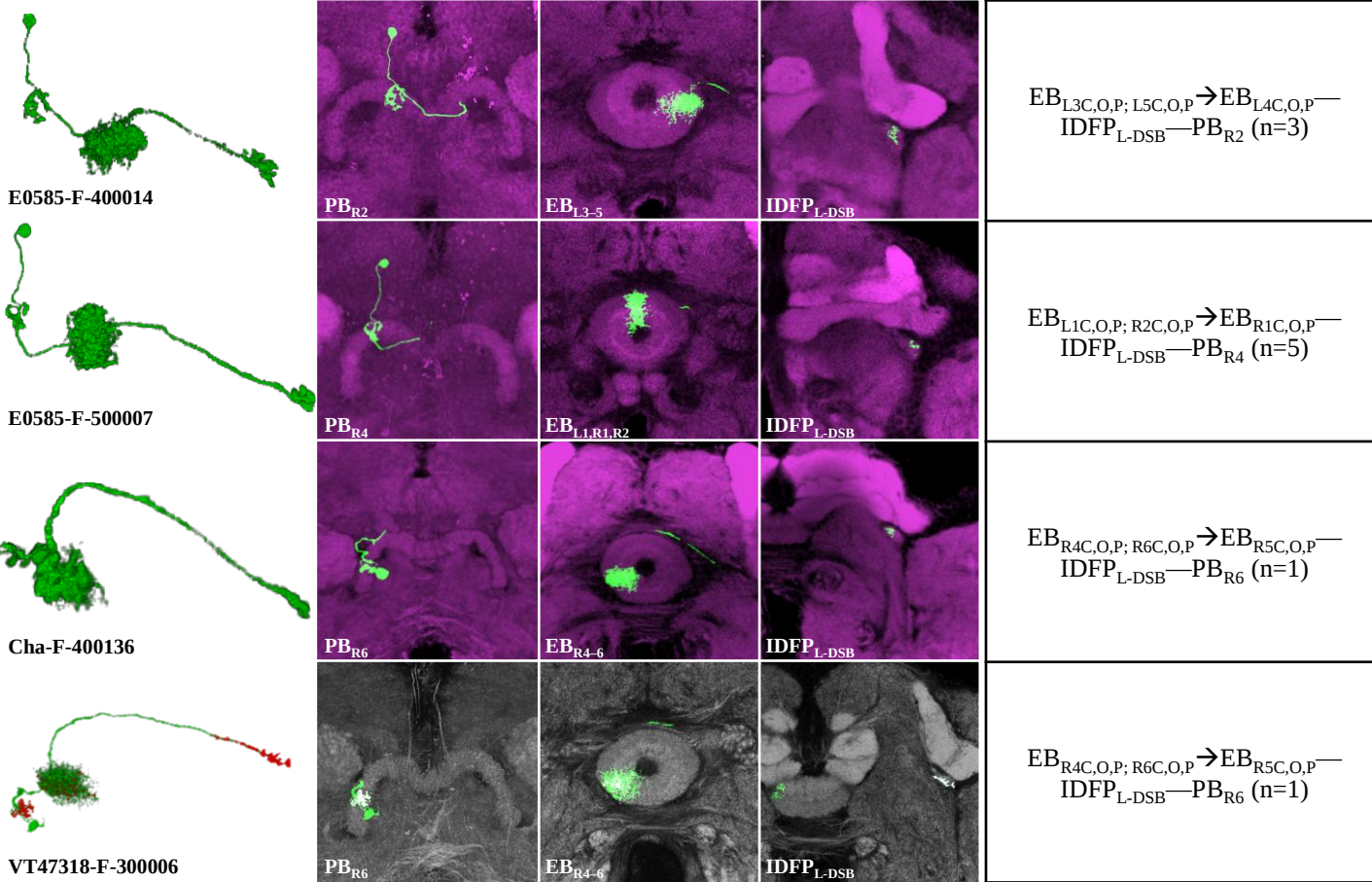
Family: $CCP_{R-ventral} \text{---} VMP_{R-dorsal} \rightarrow PB_{2-glomeruli}$

 Cha-F-100117	 PB_{R4,R5}	$CCP_{R-ventral} \text{---} VMP_{R-dorsal} \rightarrow PB_{R4,R5}$ (n=1)
 VT49130-F-300004	 PB_{R2,R3}	$CCP_{R-ventral} \text{---} VMP_{R-dorsal} \rightarrow PB_{R2,R3}$ (n=1)
 VT49130-F-300001	 PB_{R6,R7}	$CCP_{R-ventral} \text{---} VMP_{R-dorsal} \rightarrow PB_{R6,R7}$ (n=1)
 VT49130-F-400003	 PB_{R7,R8}	$CCP_{R-ventral} \text{---} VMP_{R-dorsal} \rightarrow PB_{R7,R8}$ (n=2)

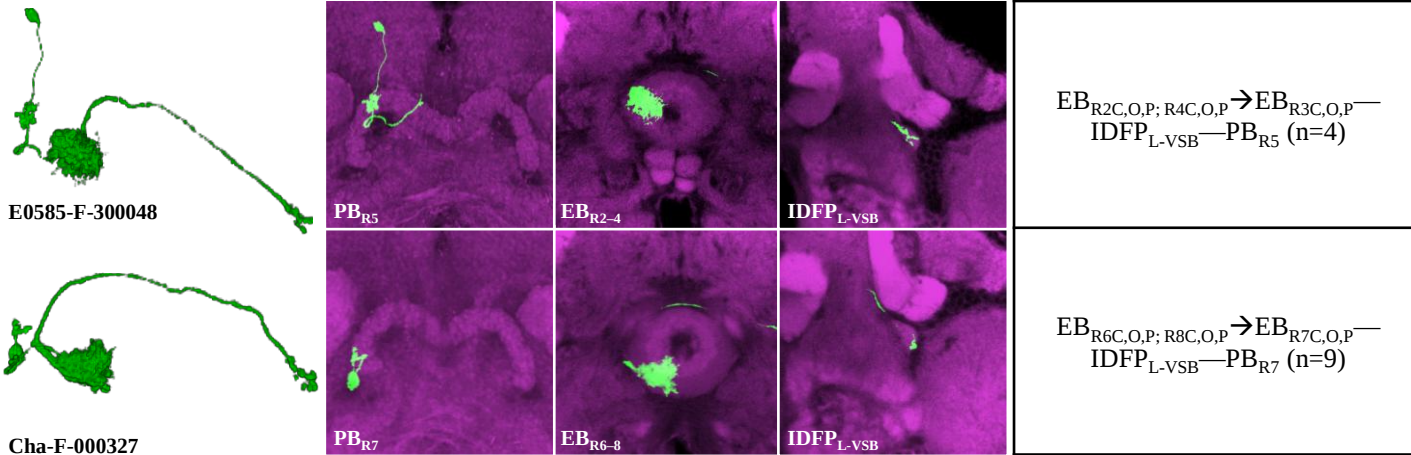
E4
Superclass: EIP neurons
Class: EIP neurons
Family: $EB_{C,O,P} \rightarrow EB_{C,O,P} \text{---} IDFP_{L-DSB} \text{---} PB_{2-glomeruli}$

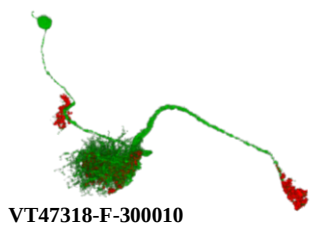


Family: $\text{EB}_{\text{C,O,P}} \rightarrow \text{EB}_{\text{C,O,P}} - \text{IDFP}_{\text{L-DSB}} - \text{PB}_{1\text{-glomerulus}}$

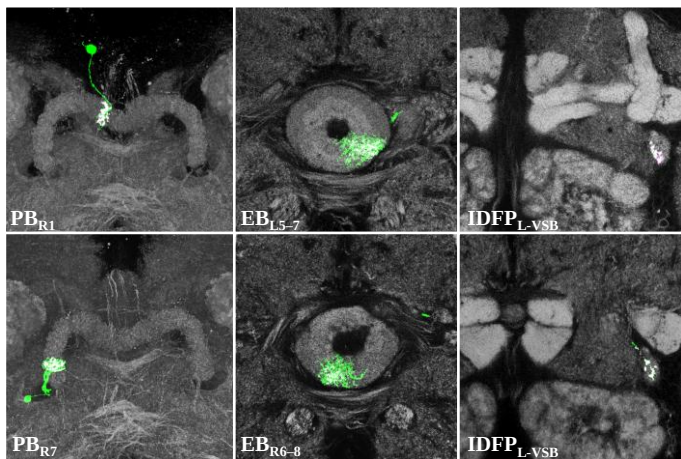


Family: $\text{EB}_{\text{C,O,P}} \rightarrow \text{EB}_{\text{C,O,P}} - \text{IDFP}_{\text{L-VSB}} - \text{PB}_{1\text{-glomerulus}}$

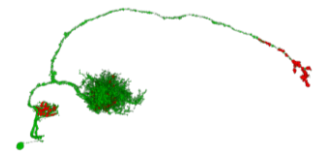




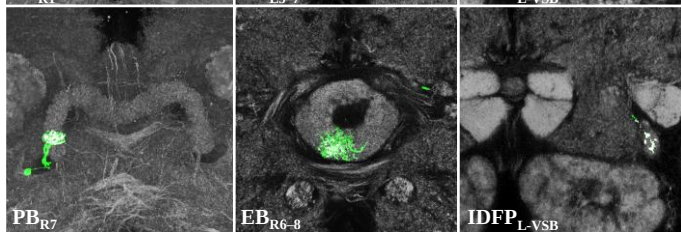
VT47318-F-300010



$EB_{L5C,O,P}; L7C,O,P \rightarrow EB_{L6C,O,P} - IDFP_{L-VSB} - PB_{R1} (n=1)$



VT47318-F-400006

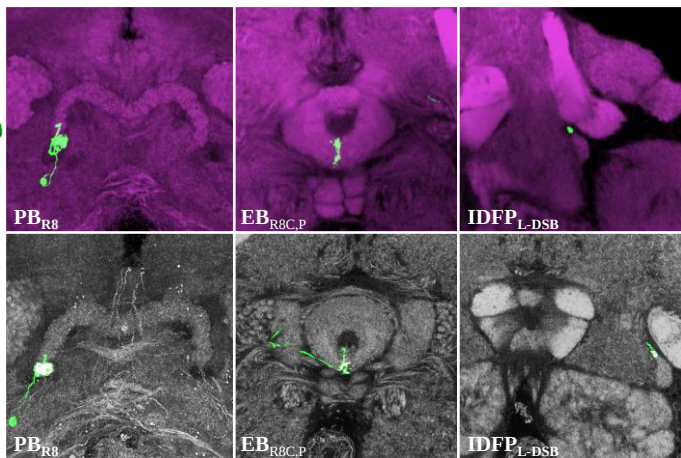


$EB_{R6C,O,P}; R8C,O,P \rightarrow EB_{R7C,O,P} - IDFP_{L-VSB} - PB_{R7} (n=2)$

Family: $EB_{C,P} \rightarrow EB_{C,P} - IDFP_{L-DSB} - PB_{1-glomerulus}$



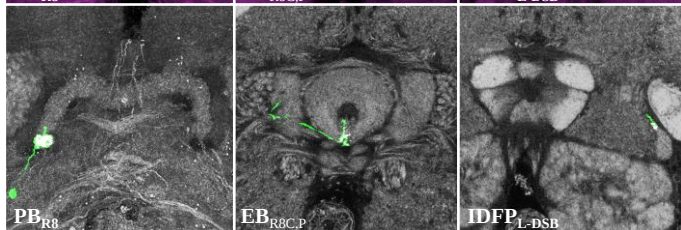
E0585-F-200000



$EB_{R8C,P} \rightarrow EB_{R8C,P} - IDFP_{L-DSB} - PB_{R8} (n=1)$



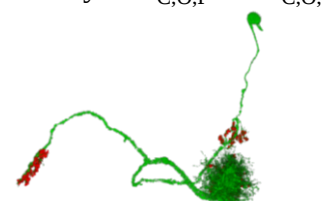
VT47318-F-300009



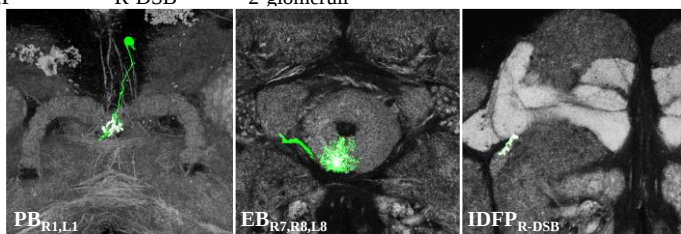
$EB_{R8C,P} \rightarrow EB_{R8C,P} - IDFP_{L-DSB} - PB_{R8} (n=4)$

Class: $EI_{R,P}$ neurons

Family: $EB_{C,O,P} \rightarrow EB_{C,O,P} - IDFP_{R-DSB} - PB_{2-glomeruli}$

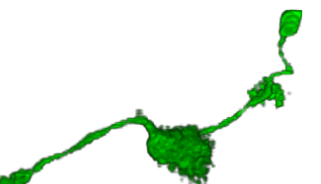


VT47318-F-300008

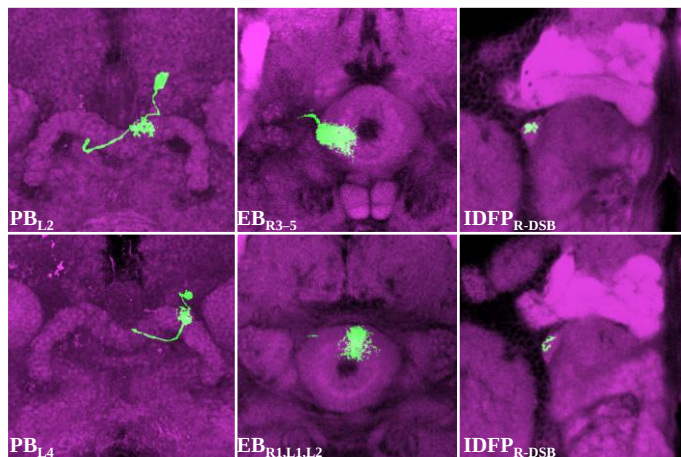


$EB_{R7C,O,P}; L8C,O,P \rightarrow EB_{R8C,O,P} - IDFP_{R-DSB} - PB_{R1,L1} (n=1)$

Family: $EB_{C,O,P} \rightarrow EB_{C,O,P} - IDFP_{R-DSB} - PB_{1-glomerulus}$



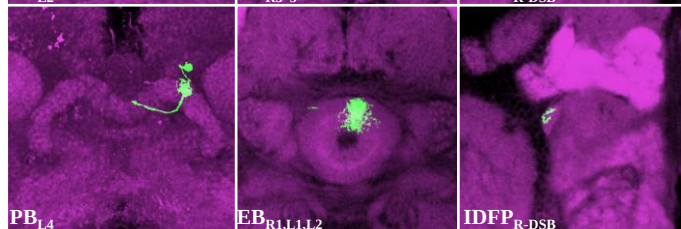
Cha-F-100322



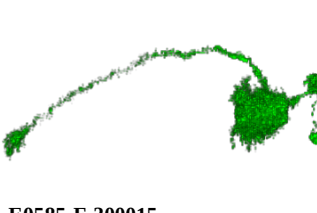
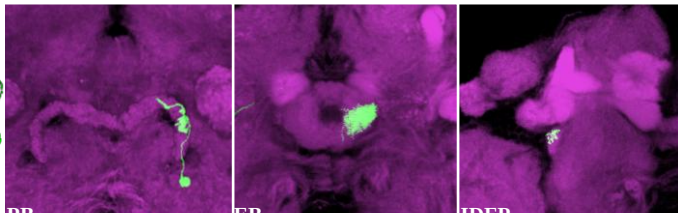
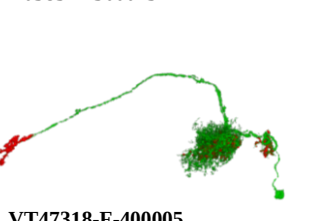
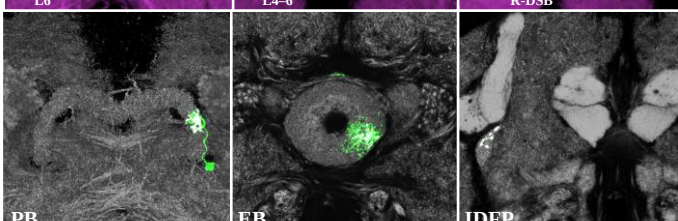
$EB_{R3C,O,P}; R5C,O,P \rightarrow EB_{R4C,O,P} - IDFP_{R-DSB} - PB_{L2} (n=3)$



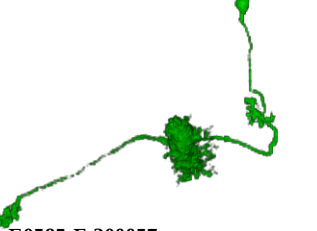
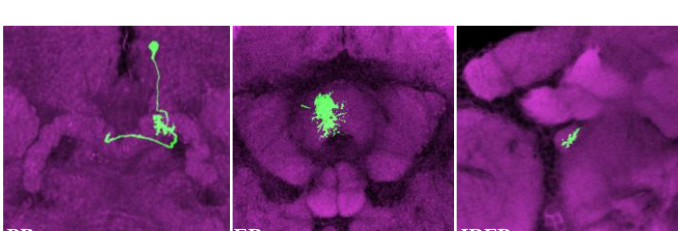
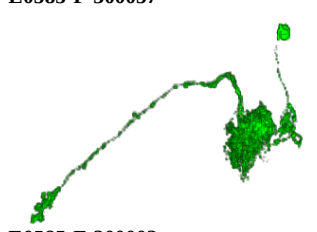
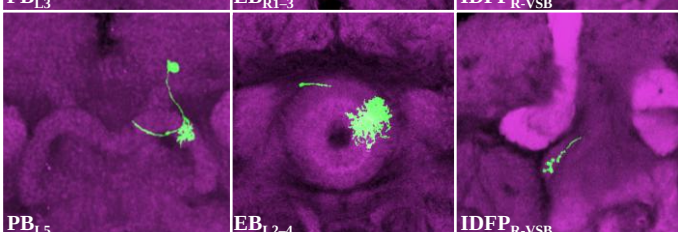
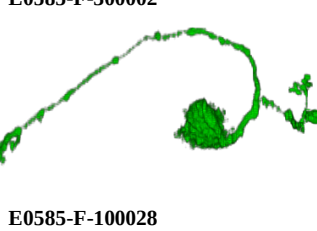
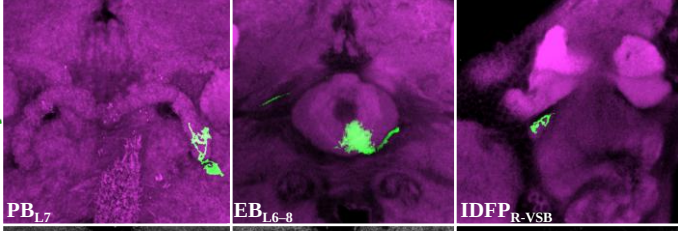
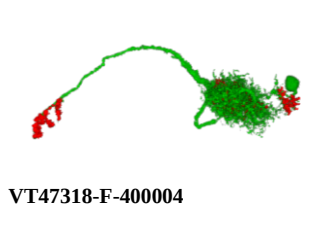
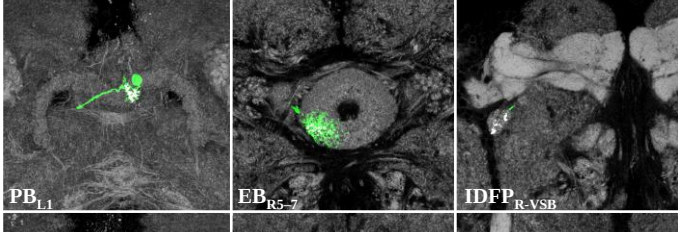
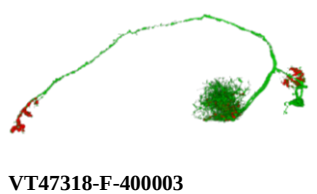
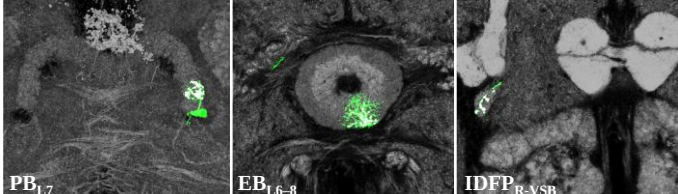
E0585-F-300028



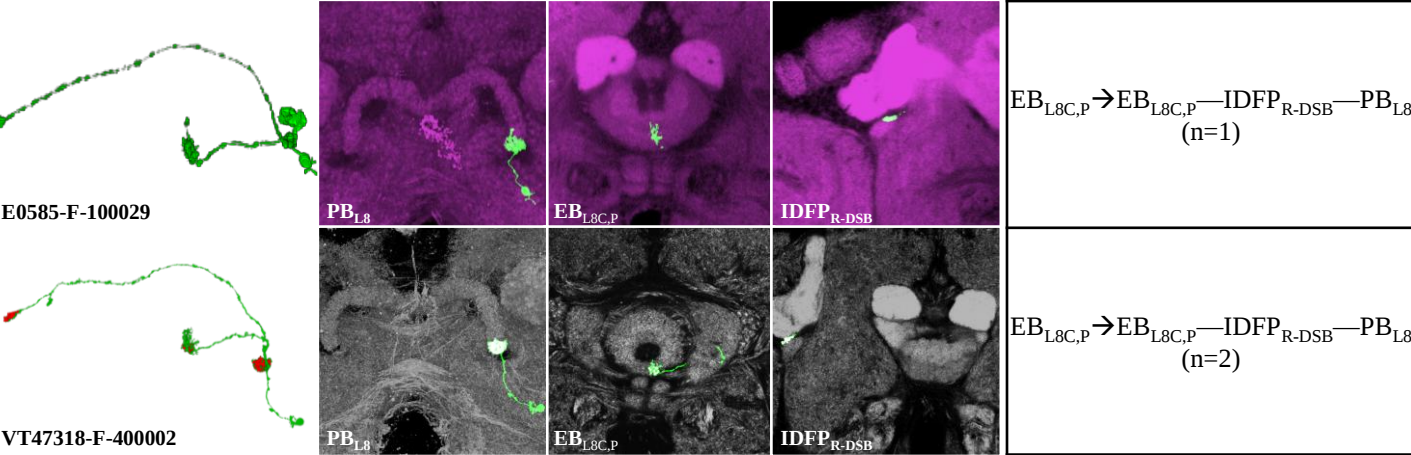
$EB_{R1C,O,P}; L2C,O,P \rightarrow EB_{L1C,O,P} - IDFP_{R-DSB} - PB_{L4} (n=6)$

 E0585-F-300015		$\text{EB}_{\text{L4C,O,P}; \text{L6C,O,P}} \rightarrow \text{EB}_{\text{L5C,O,P}} - \text{IDFP}_{\text{R-DSB}} - \text{PB}_{\text{L6}} \quad (n=1)$
 VT47318-F-400005		$\text{EB}_{\text{L4C,O,P}; \text{L6C,O,P}} \rightarrow \text{EB}_{\text{L5C,O,P}} - \text{IDFP}_{\text{R-DSB}} - \text{PB}_{\text{L6}} \quad (n=4)$

Family: $\text{EB}_{\text{C,O,P}} \rightarrow \text{EB}_{\text{C,O,P}} - \text{IDFP}_{\text{R-VSB}} - \text{PB}_{\text{1-glomerulus}}$

 E0585-F-300057		$\text{EB}_{\text{R1C,O,P}; \text{R3C,O,P}} \rightarrow \text{EB}_{\text{R2C,O,P}} - \text{IDFP}_{\text{R-VSB}} - \text{PB}_{\text{L3}} \quad (n=4)$
 E0585-F-300002		$\text{EB}_{\text{L2C,O,P}; \text{L4C,O,P}} \rightarrow \text{EB}_{\text{L3C,O,P}} - \text{IDFP}_{\text{R-VSB}} - \text{PB}_{\text{L5}} \quad (n=3)$
 E0585-F-100028		$\text{EB}_{\text{L6C,O,P}; \text{L8C,O,P}} \rightarrow \text{EB}_{\text{L7C,O,P}} - \text{IDFP}_{\text{R-VSB}} - \text{PB}_{\text{L7}} \quad (n=1)$
 VT47318-F-400004		$\text{EB}_{\text{R5C,O,P}; \text{R7C,O,P}} \rightarrow \text{EB}_{\text{R6C,O,P}} - \text{IDFP}_{\text{R-VSB}} - \text{PB}_{\text{L1}} \quad (n=1)$
 VT47318-F-400003		$\text{EB}_{\text{L6C,O,P}; \text{L8C,O,P}} \rightarrow \text{EB}_{\text{L7C,O,P}} - \text{IDFP}_{\text{R-VSB}} - \text{PB}_{\text{L7}} \quad (n=3)$

Family: $EB_{C,P} \rightarrow EB_{C,P} - IDFP_{R-DSB} - PB_{1-glomerulus}$

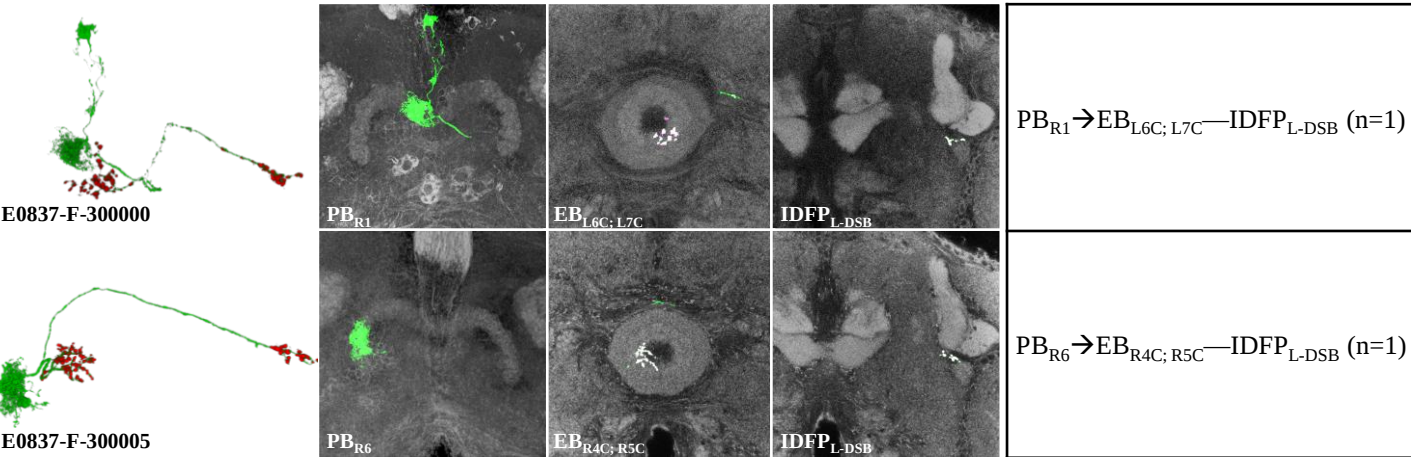


E5

Superclass: PEI neurons

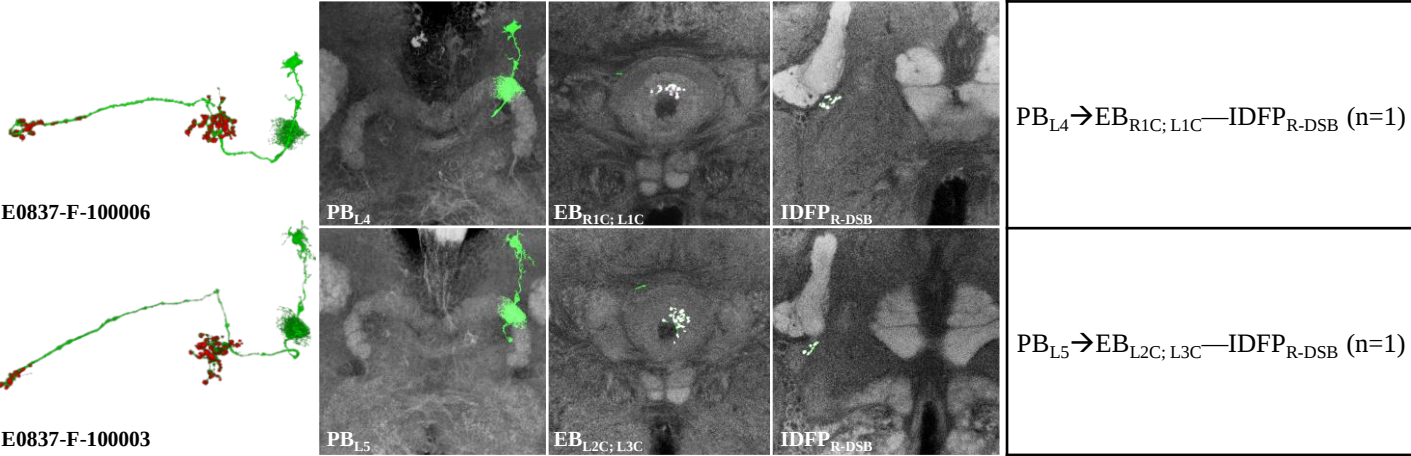
Class: PEI_L neurons

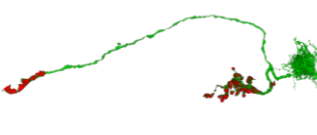
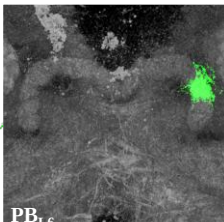
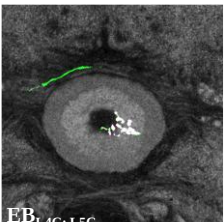
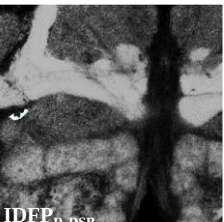
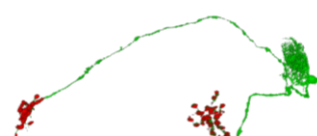
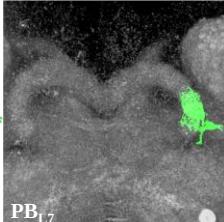
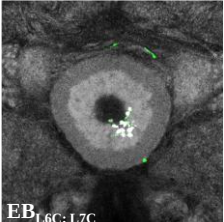
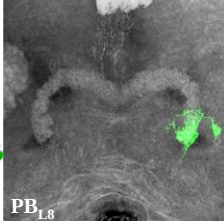
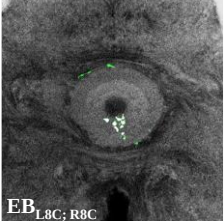
Family: $PB_{1-glomerulus} \rightarrow EB_C - IDFP_{L-DSB}$



Class: PEI_R neurons

Family: $PB_{1-glomerulus} \rightarrow EB_C - IDFP_{R-DSB}$



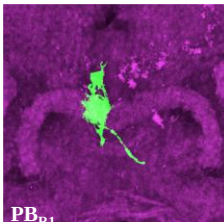
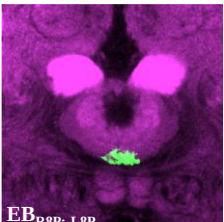
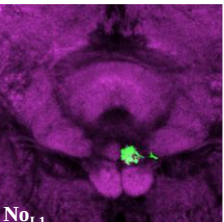
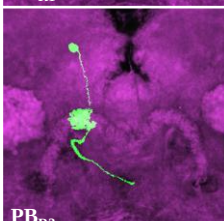
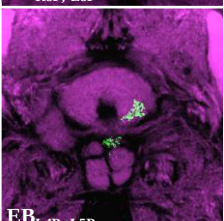
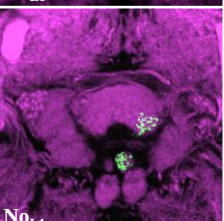
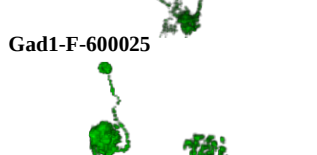
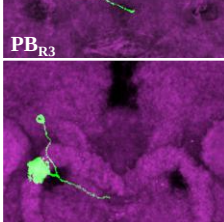
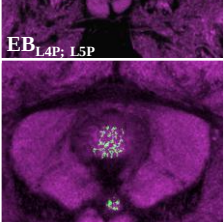
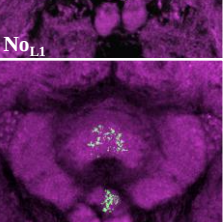
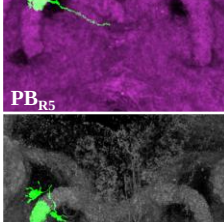
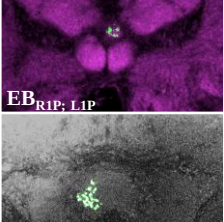
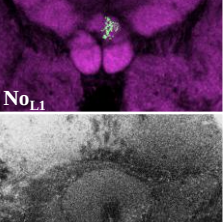
 E0837-F-100010	 PB _{L6}	 EB _{L4C; L5C}	 IDFP _{R-DSB}	PB _{L6} →EB _{L4C; L5C} —IDFP _{R-DSB} (n=1)
 E0837-F-000005	 PB _{L7}	 EB _{L6C; L7C}	 IDFP _{R-DSB}	PB _{L7} →EB _{L6C; L7C} —IDFP _{R-DSB} (n=1)
 E0837-F-000000	 PB _{L8}	 EB _{L8C; R8C}	 IDFP _{R-DSB}	PB _{L8} →EB _{L8C; R8C} —IDFP _{R-DSB} (n=3)

E6

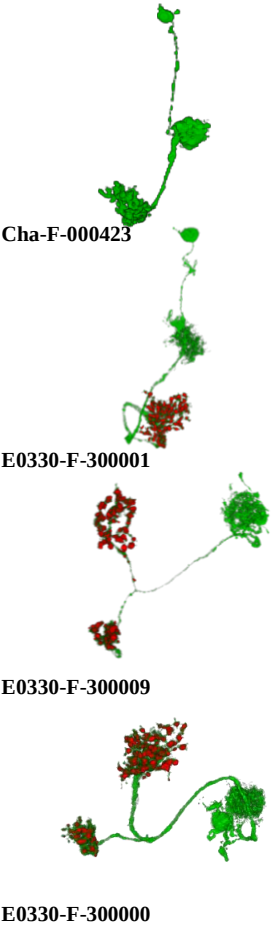
Superclass: PEN neurons

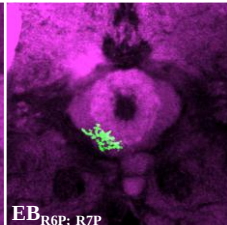
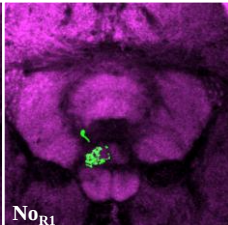
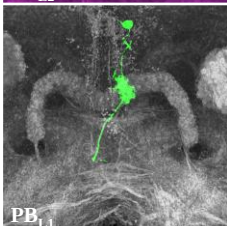
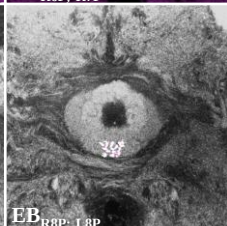
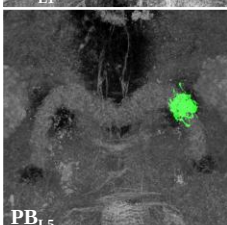
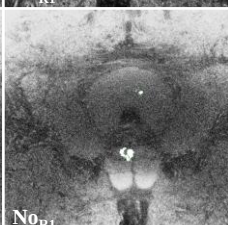
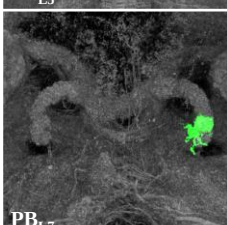
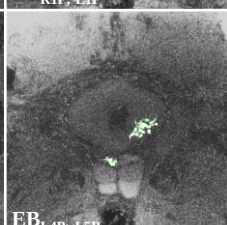
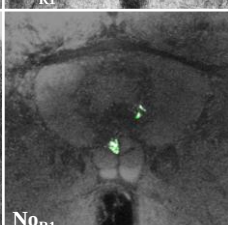
Class: PEN_L neurons

Family: PB_{1-glomerulus}→EB_p—No_{L1}

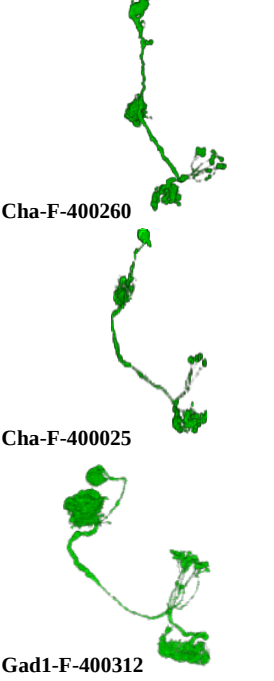
 Gad1-F-200375	 PB _{R1}	 EB _{R8P; L8P}	 No _{L1}	PB _{R1} →EB _{R8P; L8P} —No _{L1} (n=1)
 Gad1-F-600025	 PB _{R3}	 EB _{L4P; L5P}	 No _{L1}	PB _{R3} →EB _{L4P; L5P} —No _{L1} (n=3)
 fru-F-100063	 PB _{R5}	 EB _{R1P; L1P}	 No _{L1}	PB _{R5} →EB _{R1P; L1P} —No _{L1} (n=2)
 E0330-F-300012	 PB _{R6}	 EB _{R2P; R3P}	 No _{L1}	PB _{R6} →EB _{R2P; R3P} —No _{L1} (n=1)

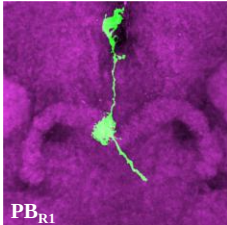
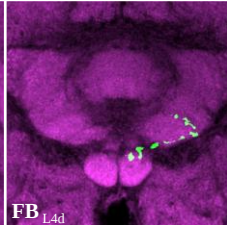
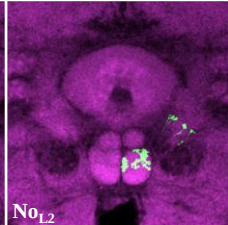
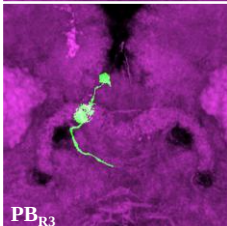
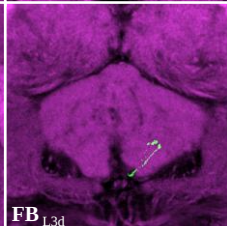
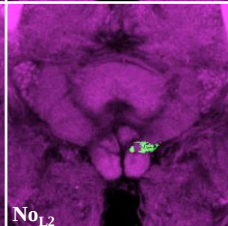
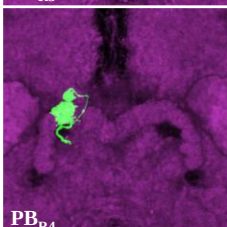
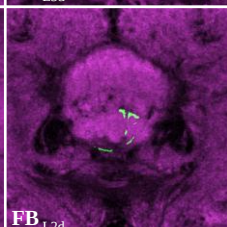
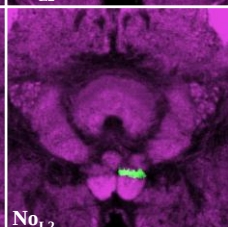
Class: PEN_R neurons
Family: PB_{1-glomerulus} → EB_p — No_{R1}

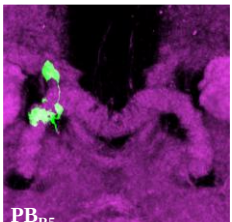
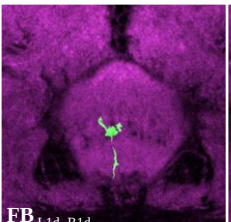
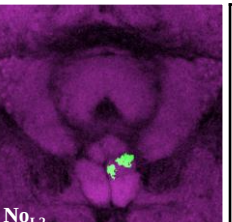
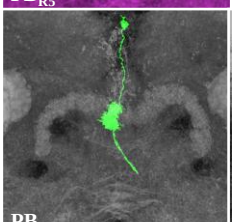
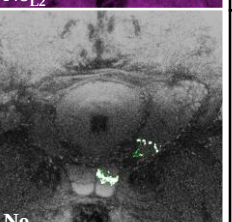
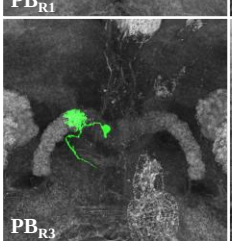
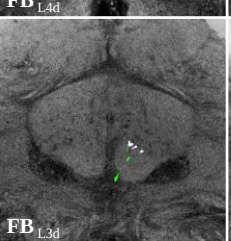
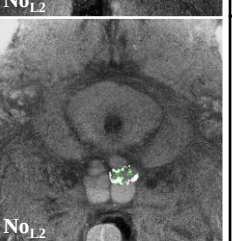


 PB _{L2}	 EB _{R6P; R7P}	 No _{R1}	PB _{L2} → EB _{R6P; R7P} — No _{R1} (n=1)
 PB _{L1}	 EB _{R8P; L8P}	 No _{R1}	PB _{L1} → EB _{R8P; L8P} — No _{R1} (n=1)
 PB _{L5}	 EB _{R1P; L1P}	 No _{R1}	PB _{L5} → EB _{R1P; L1P} — No _{R1} (n=1)
 PB _{L7}	 EB _{L4P; L5P}	 No _{R1}	PB _{L7} → EB _{L4P; L5P} — No _{R1} (n=1)

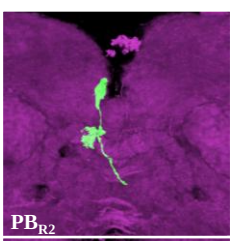
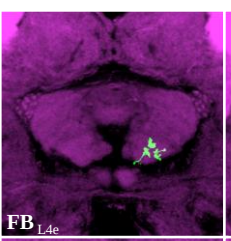
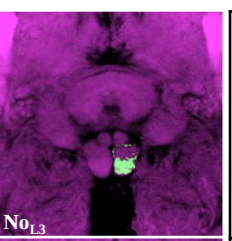
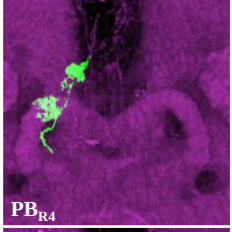
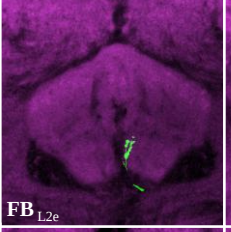
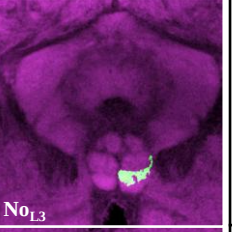
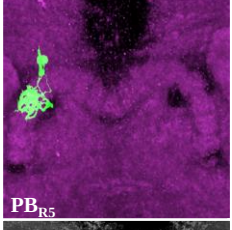
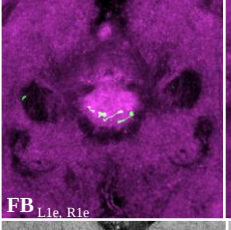
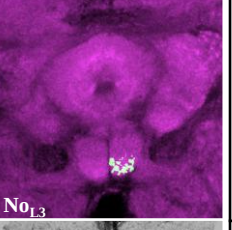
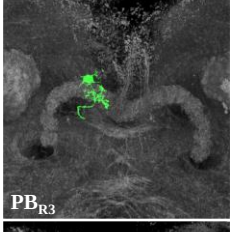
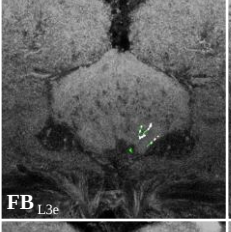
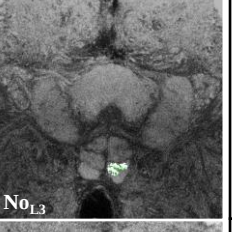
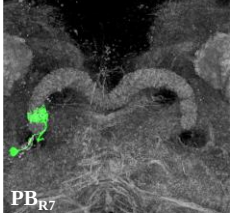
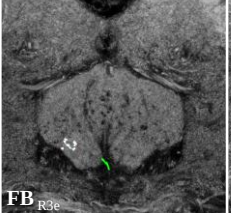
E7
Superclass: PFN neurons
Class: PFN_L neurons
Family: PB_{1-glomerulus} → FB_d — No_{L2}



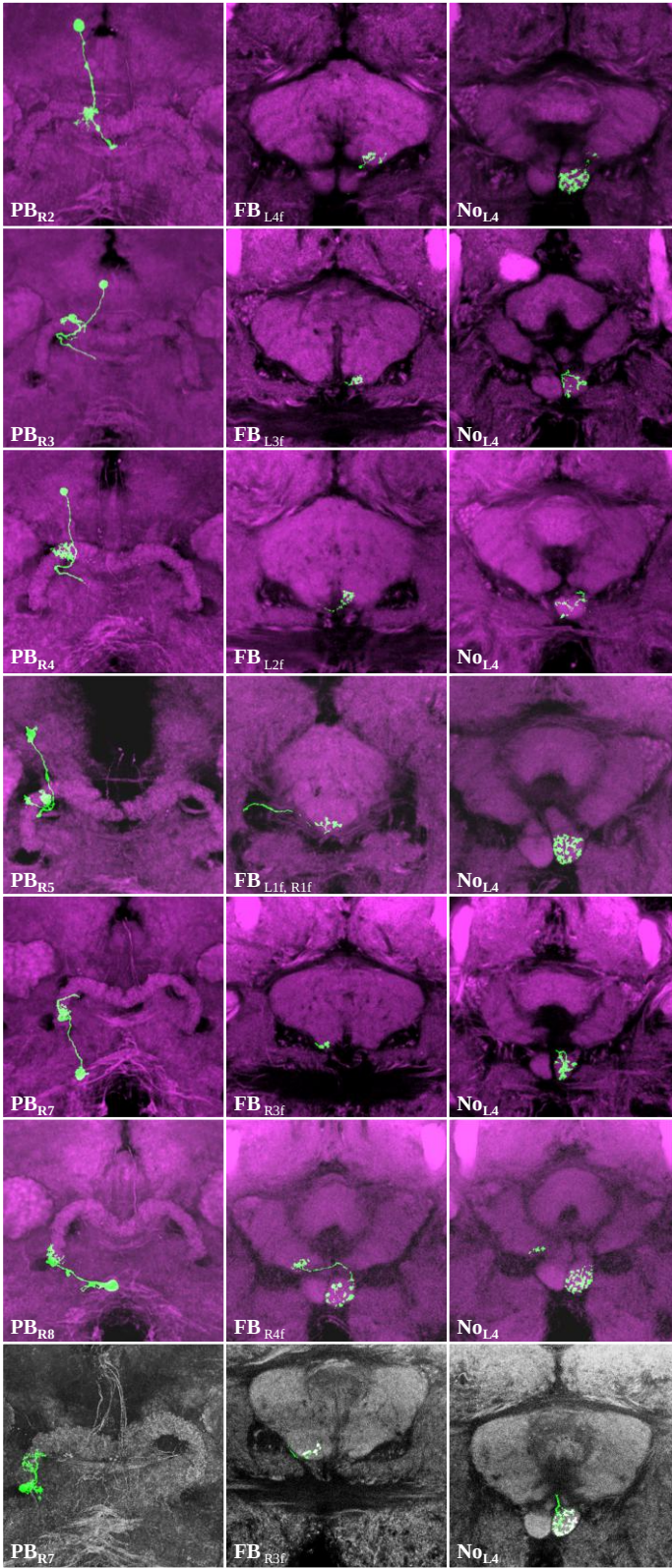
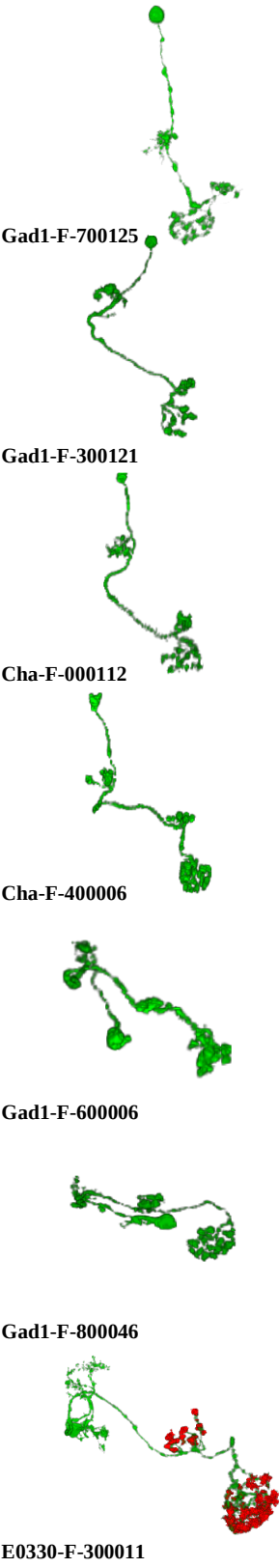
 PB _{R1}	 FB _{L4d}	 No _{L2}	PB _{R1} → FB _{L4d} — No _{L2} (n=1)
 PB _{R3}	 FB _{L3d}	 No _{L2}	PB _{R3} → FB _{L3d} — No _{L2} (n=1)
 PB _{R4}	 FB _{L2d}	 No _{L2}	PB _{R4} → FB _{L2d} — No _{L2} (n=1)

Gad1-F-000066				$PB_{R5} \rightarrow FB_{L1d, R1d} \text{---} No_{L2} \text{ (n=1)}$
E0330-F-300007				$PB_{R1} \rightarrow FB_{L4d} \text{---} No_{L2} \text{ (n=1)}$
E0330-F-000000				$PB_{R3} \rightarrow FB_{L3d} \text{---} No_{L2} \text{ (n=1)}$

Family: $PB_{1\text{-glomerulus}} \rightarrow FB_e \text{---} No_{L3}$

Cha-F-300152				$PB_{R2} \rightarrow FB_{L4e} \text{---} No_{L3} \text{ (n=1)}$
Gad1-F-800113				$PB_{R4} \rightarrow FB_{L2e} \text{---} No_{L3} \text{ (n=1)}$
Gad1-F-000157				$PB_{R5} \rightarrow FB_{L1e, R1e} \text{---} No_{L3} \text{ (n=1)}$
E0330-F-300004				$PB_{R3} \rightarrow FB_{L3e} \text{---} No_{L3} \text{ (n=1)}$
E0330-F-300006				$PB_{R7} \rightarrow FB_{R3e} \text{---} No_{L3} \text{ (n=1)}$

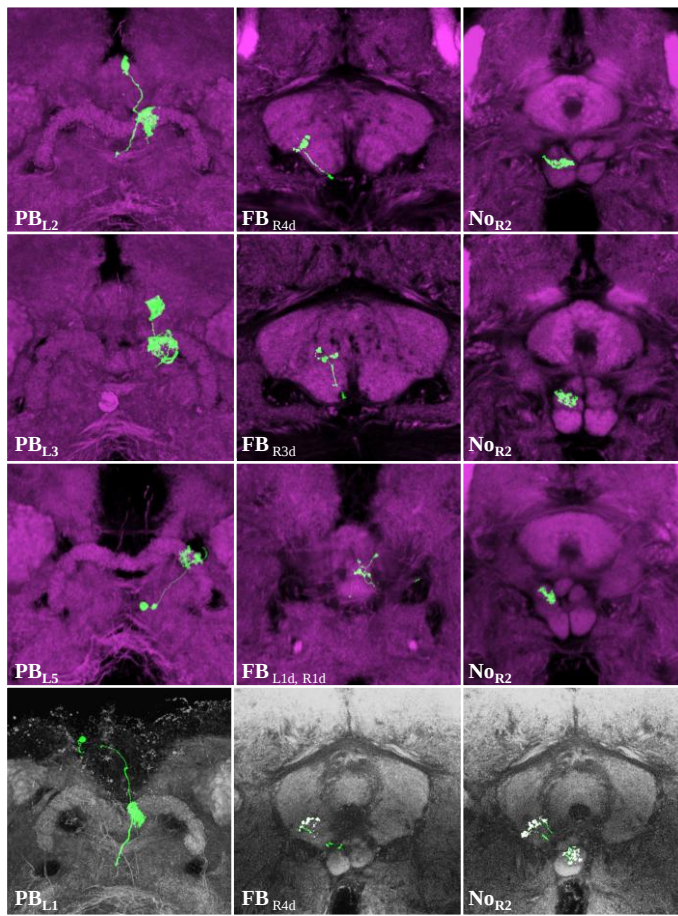
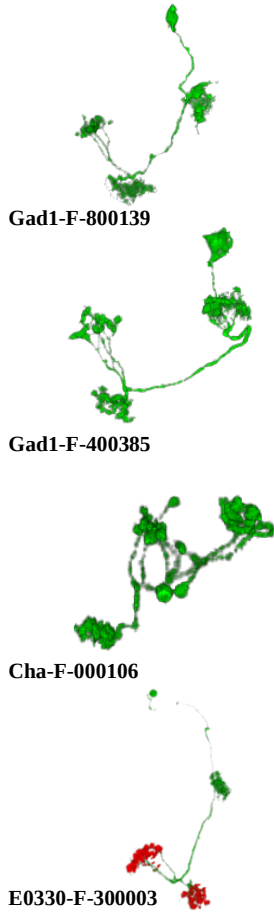
Family: PB_{1-glomerulus}→FB_f—No_{L4}



PB _{R2} →FB _{L4f} —No _{L4} (n=1)		
PB _{R3} →FB _{L3f} —No _{L4} (n=5)		
PB _{R4} →FB _{L2f} —No _{L4} (n=2)		
PB _{R5} →FB _{L1f, R1f} —No _{L4} (n=4)		
PB _{R7} →FB _{R3f} —No _{L4} (n=3)		
PB _{R8} →FB _{R4f} —No _{L4} (n=4)		
PB _{R7} →FB _{R3f} —No _{L4} (n=1)		

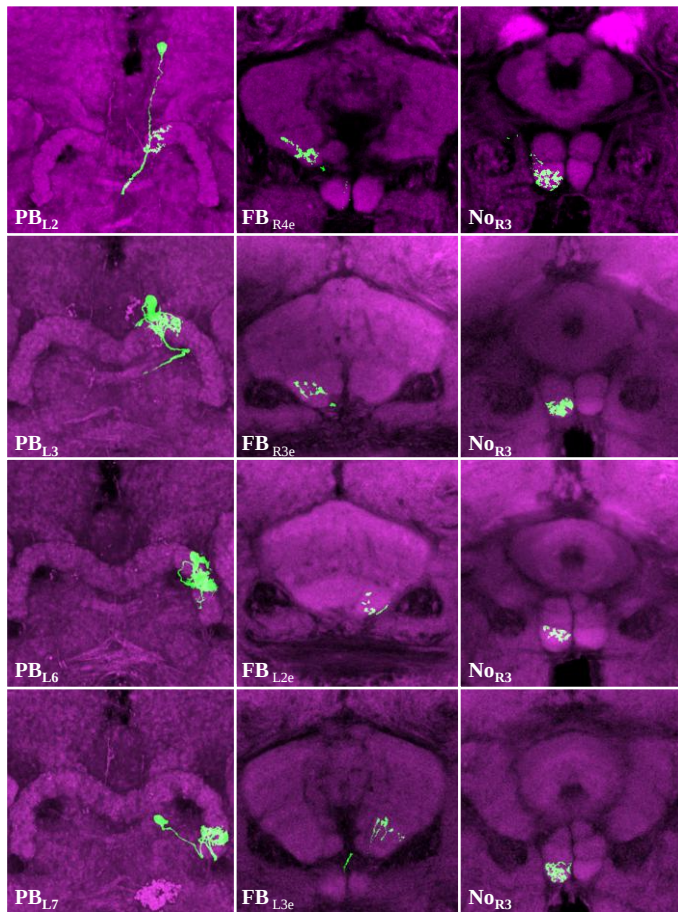
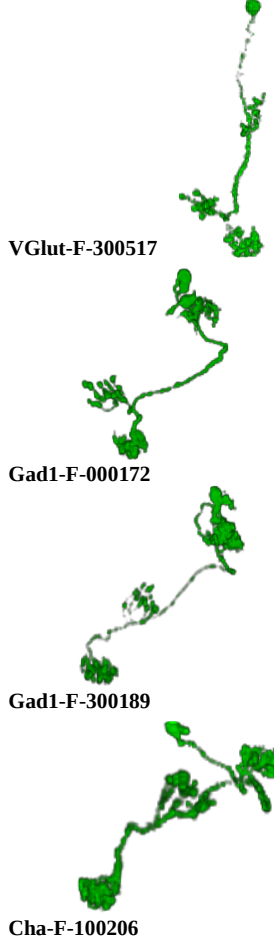
Class: PFN_R neurons

Family: PB_{1-glomerulus}→FB_d—No_{R2}



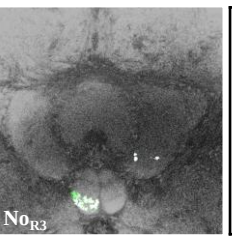
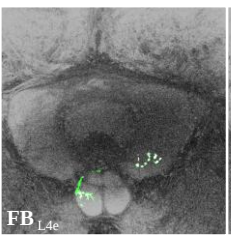
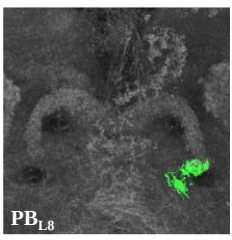
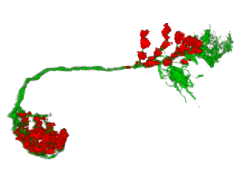
$PB_{L2} \rightarrow FB_{R4d} \text{---} No_{R2} \text{ (n=1)}$
$PB_{L3} \rightarrow FB_{R3d} \text{---} No_{R2} \text{ (n=1)}$
$PB_{L5} \rightarrow FB_{L1d, R1d} \text{---} No_{R2} \text{ (n=1)}$
$PB_{L1} \rightarrow FB_{R4d} \text{---} No_{R2} \text{ (n=1)}$

Family: PB_{1-glomerulus} $\rightarrow$ FB_e --- No_{R3}



$PB_{L2} \rightarrow FB_{R4e} \text{---} No_{R3} \text{ (n=1)}$
$PB_{L3} \rightarrow FB_{R3e} \text{---} No_{R3} \text{ (n=1)}$
$PB_{L6} \rightarrow FB_{L2e} \text{---} No_{R3} \text{ (n=1)}$
$PB_{L7} \rightarrow FB_{L3e} \text{---} No_{R3} \text{ (n=1)}$

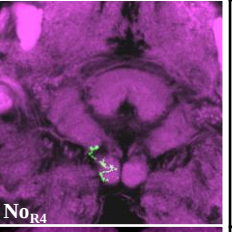
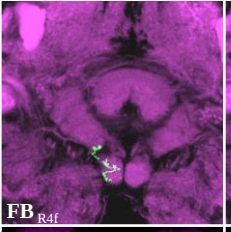
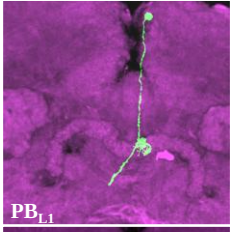
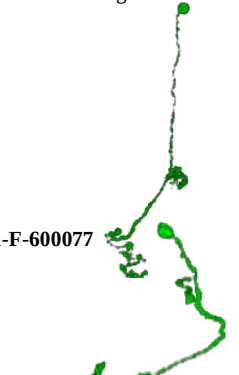
E0330-F-300008



$PB_{L8} \rightarrow FB_{L4e} - No_{R3}$ (n=1)

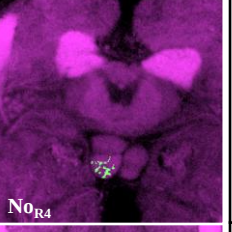
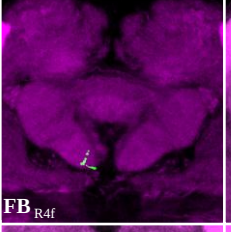
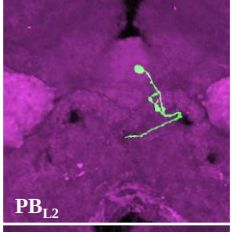
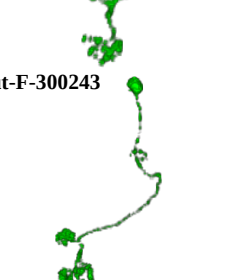
Family: $PB_{1-glomerulus} \rightarrow FB_f - No_{R4}$

Gad1-F-600077



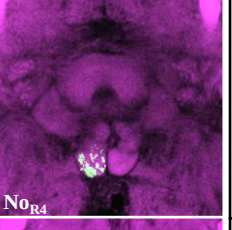
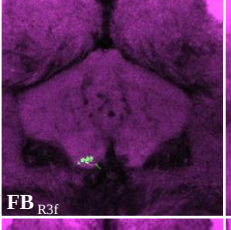
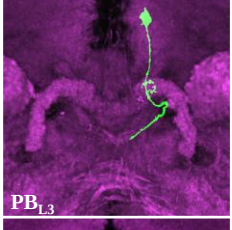
$PB_{L1} \rightarrow FB_{R4f} - No_{R4}$ (n=2)

VGlut-F-300243



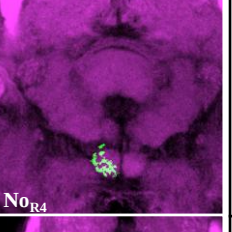
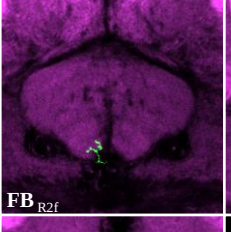
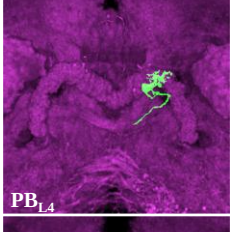
$PB_{L2} \rightarrow FB_{R4f} - No_{R4}$ (n=1)

Gad1-F-400104



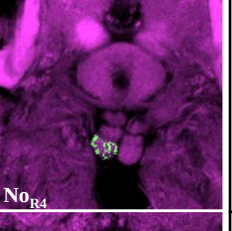
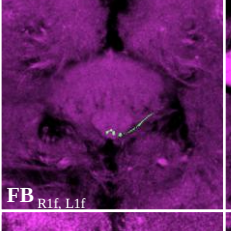
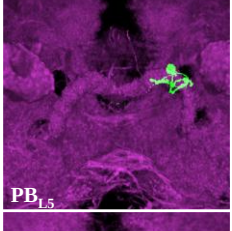
$PB_{L3} \rightarrow FB_{R3f} - No_{R4}$ (n=4)

Cha-F-000023



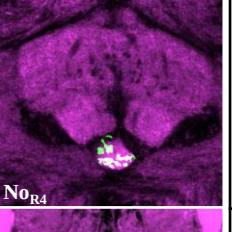
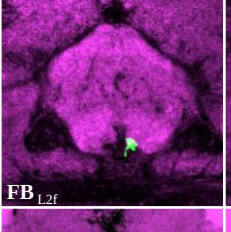
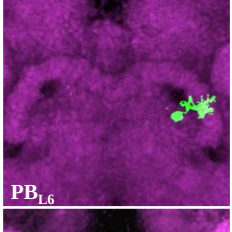
$PB_{L4} \rightarrow FB_{R2f} - No_{R4}$ (n=2)

Gad1-F-000056



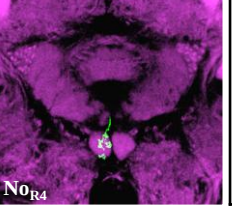
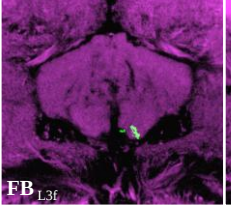
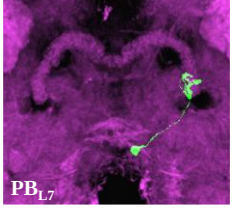
$PB_{L5} \rightarrow FB_{R1f, L1f} - No_{R4}$ (n=6)

Cha-F-500285

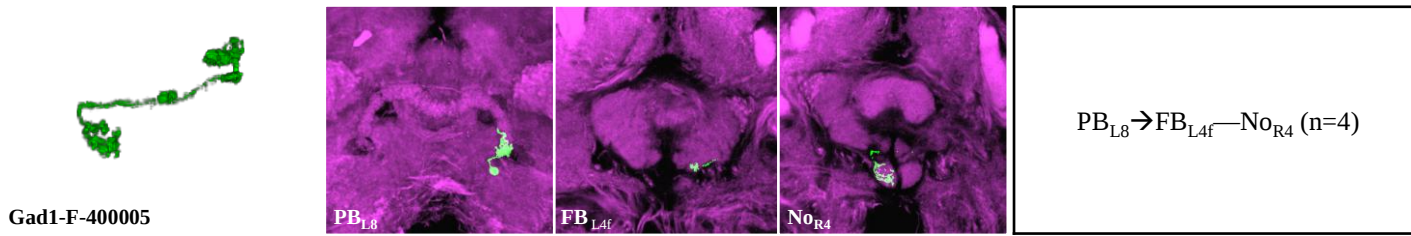


$PB_{L6} \rightarrow FB_{L2f} - No_{R4}$ (n=1)

Gad1-F-600003



$PB_{L7} \rightarrow FB_{L3f} - No_{R4}$ (n=3)

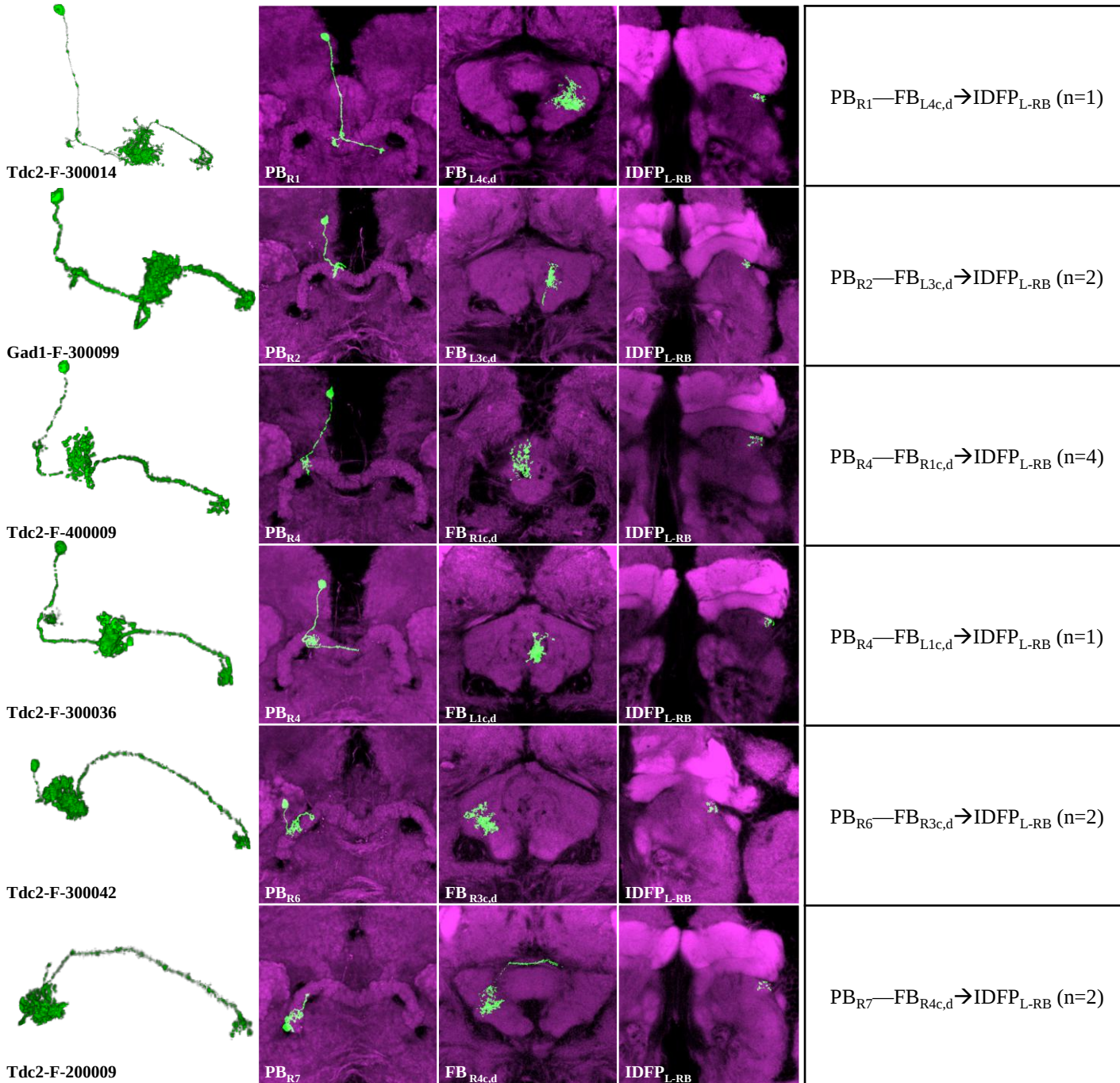


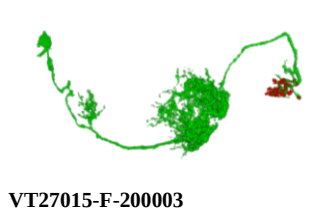
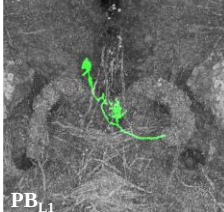
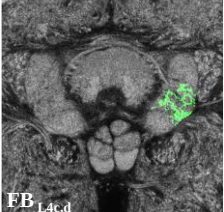
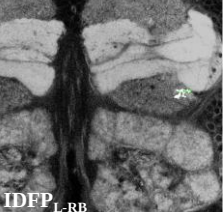
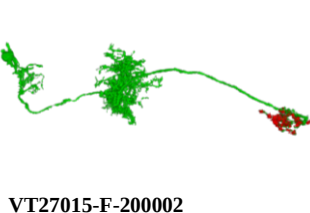
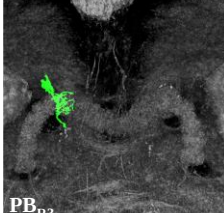
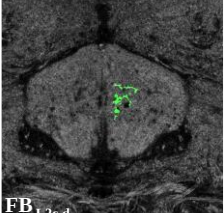
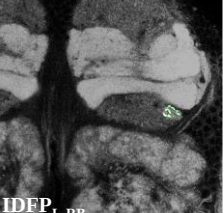
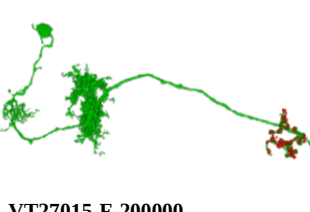
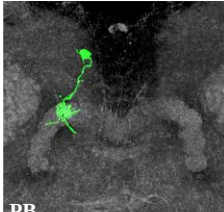
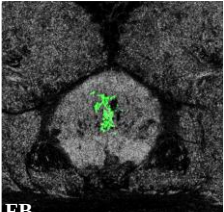
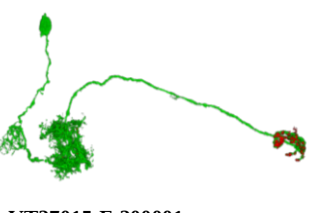
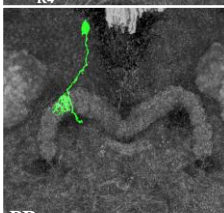
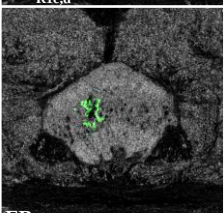
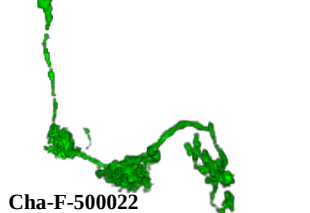
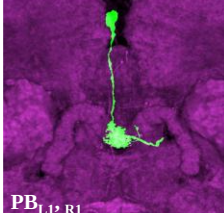
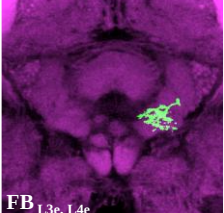
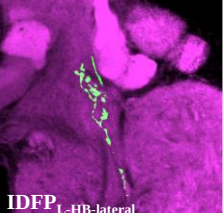
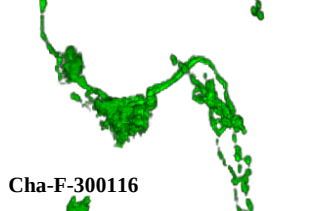
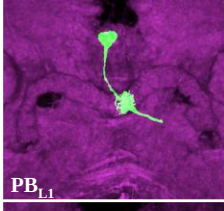
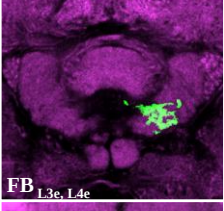
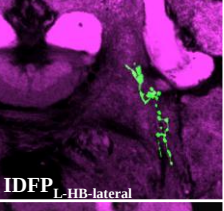
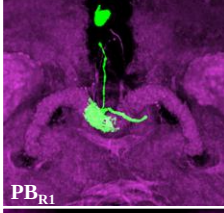
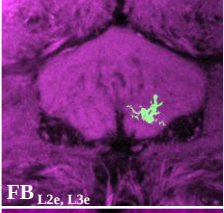
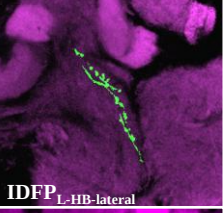
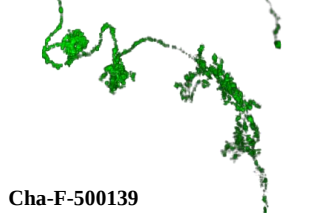
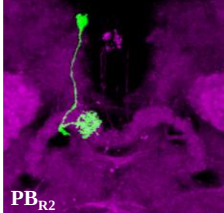
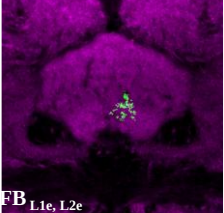
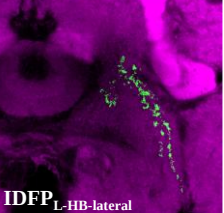
E8

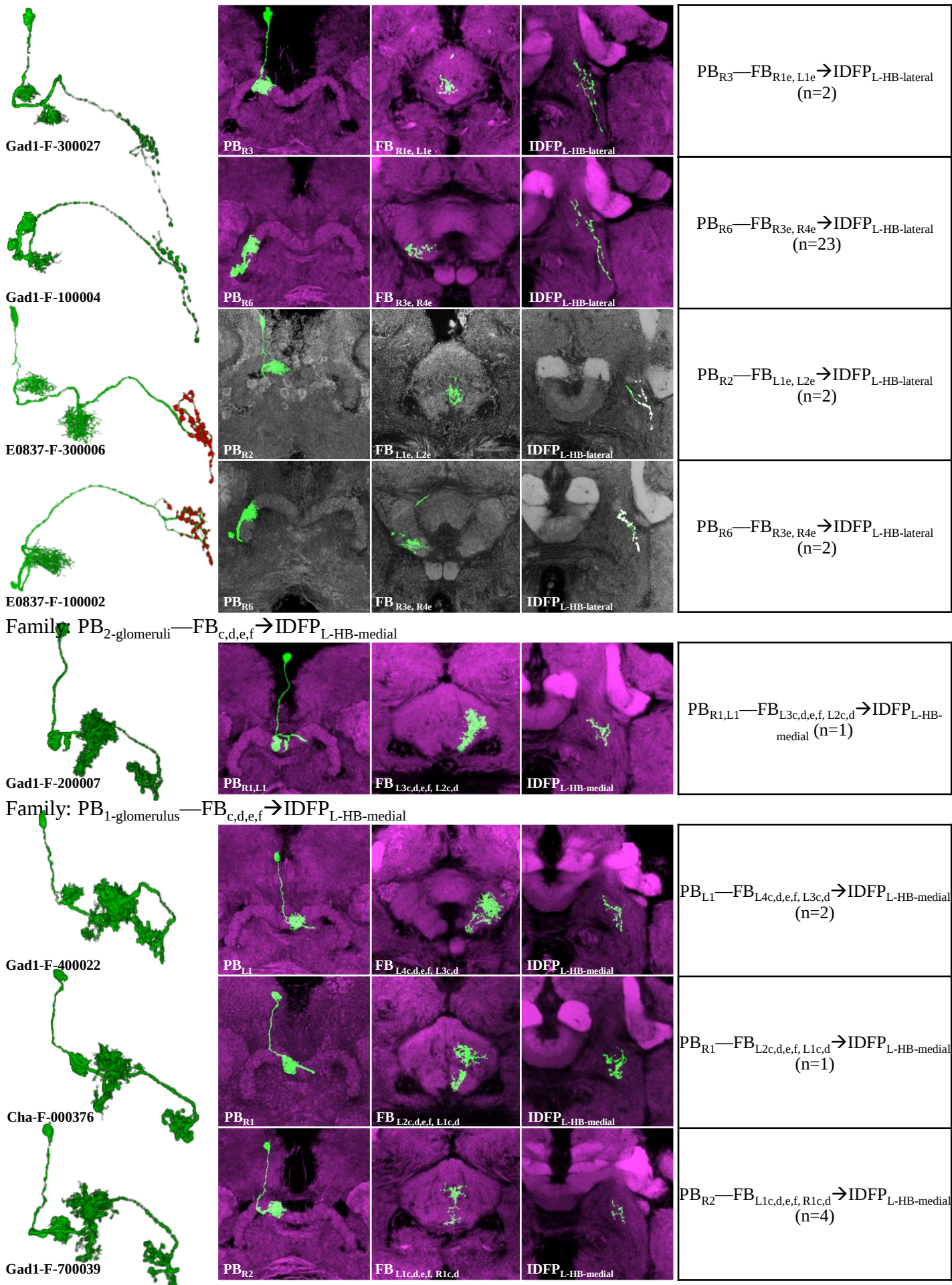
Superclass: PFI neurons

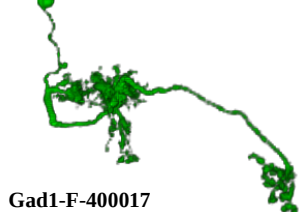
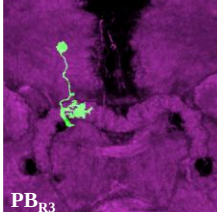
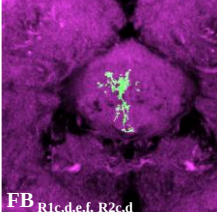
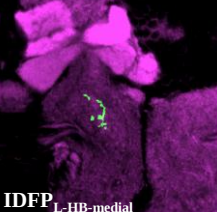
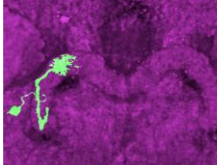
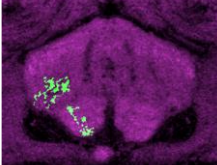
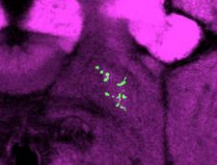
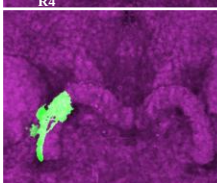
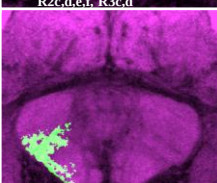
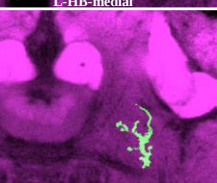
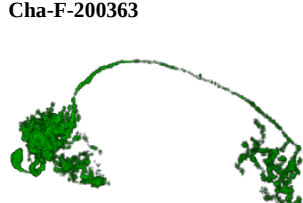
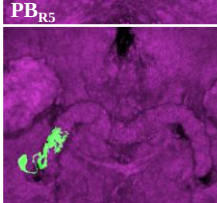
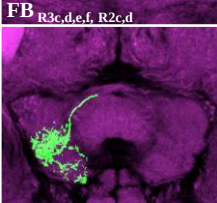
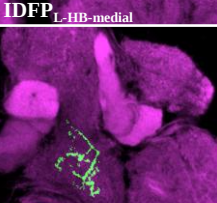
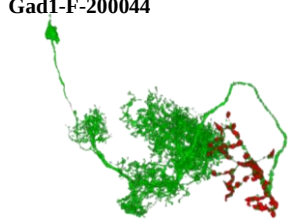
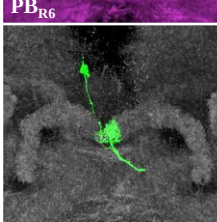
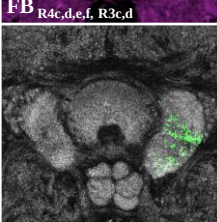
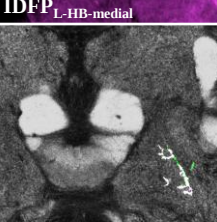
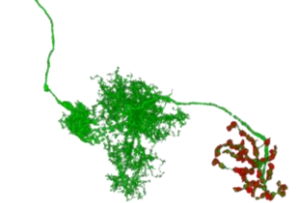
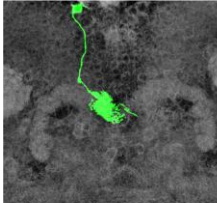
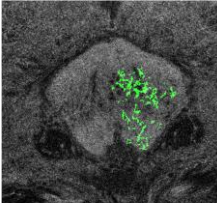
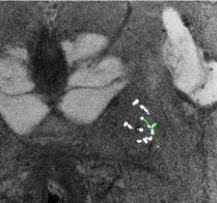
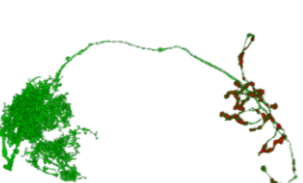
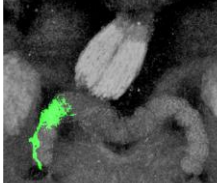
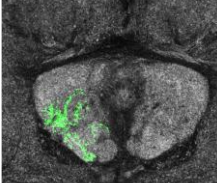
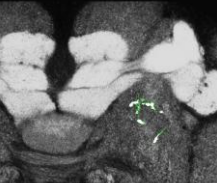
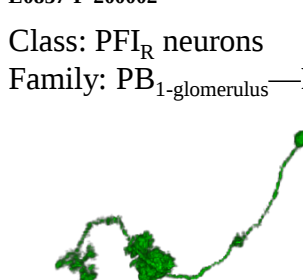
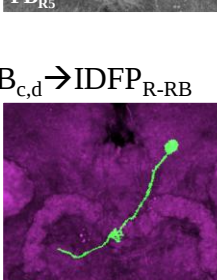
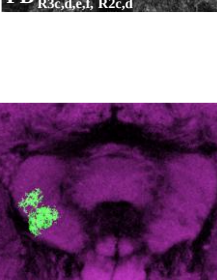
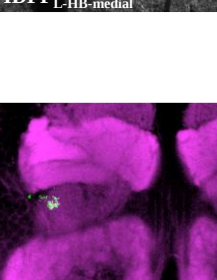
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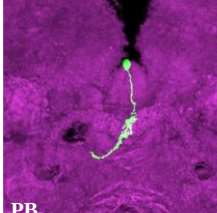
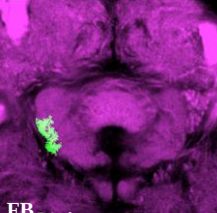
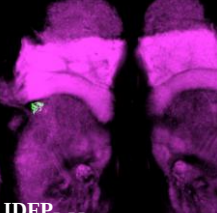
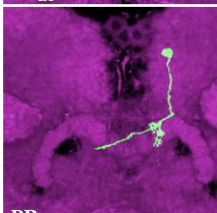
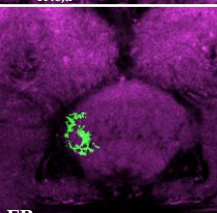
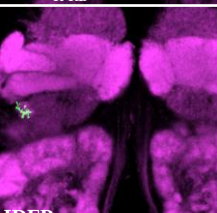
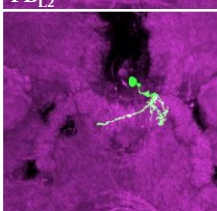
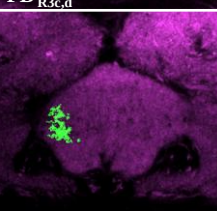
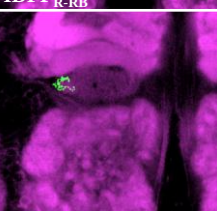
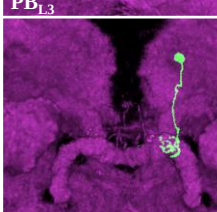
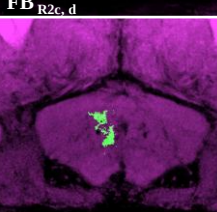
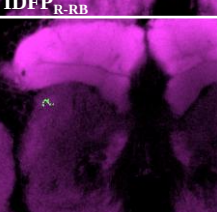
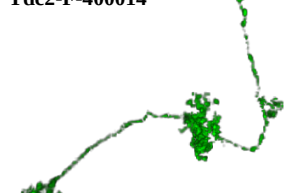
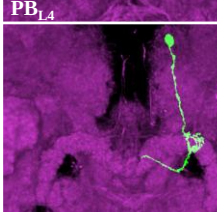
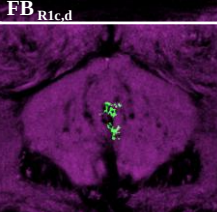
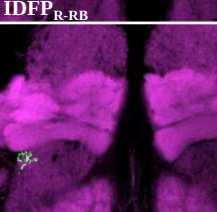
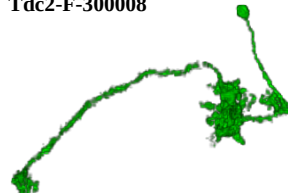
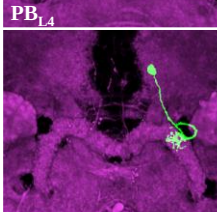
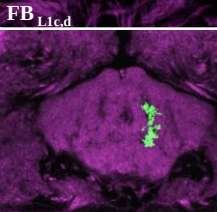
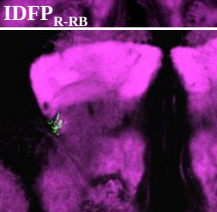
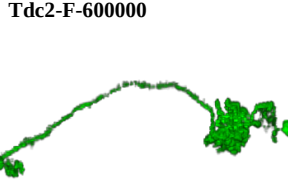
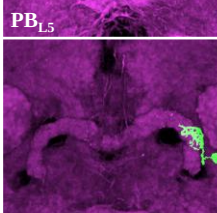
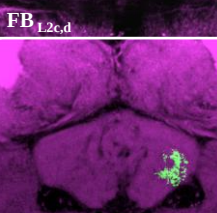
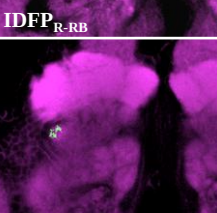
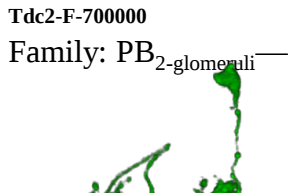
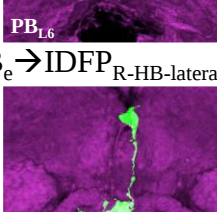
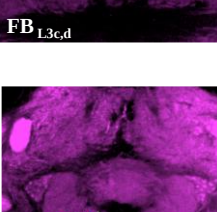
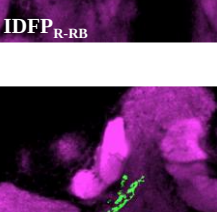
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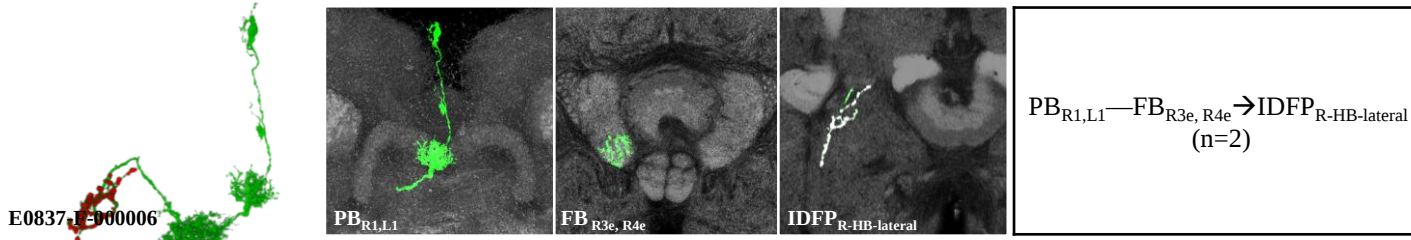


 VT27015-F-200003	 PB_{L1}	 FB_{L4c,d}	 IDFP_{L-RB}	$\text{PB}_{\text{L1}}\text{---FB}_{\text{L4c,d}}\rightarrow\text{IDFP}_{\text{L-RB}}\ (n=1)$
 VT27015-F-200002	 PB_{R3}	 FB_{L2c,d}	 IDFP_{L-RB}	$\text{PB}_{\text{R3}}\text{---FB}_{\text{L2c,d}}\rightarrow\text{IDFP}_{\text{L-RB}}\ (n=1)$
 VT27015-F-200000	 PB_{R4}	 FB_{R1c,d}	 IDFP_{L-RB}	$\text{PB}_{\text{R4}}\text{---FB}_{\text{R1c,d}}\rightarrow\text{IDFP}_{\text{L-RB}}\ (n=1)$
 VT27015-F-200001	 PB_{R5}	 FB_{R2c,d}	 IDFP_{L-RB}	$\text{PB}_{\text{R5}}\text{---FB}_{\text{R2c,d}}\rightarrow\text{IDFP}_{\text{L-RB}}\ (n=1)$
Family: PB_{2-glomeruli}—FB_e→IDFP_{L-HB-lateral}				
 Cha-F-500022	 PB_{L1, R1}	 FB_{L3e, L4e}	 IDFP_{L-HB-lateral}	$\text{PB}_{\text{R1,L1}}\text{---FB}_{\text{L3e, L4e}}\rightarrow\text{IDFP}_{\text{L-HB-lateral}}\ (n=25)$
Family: PB_{1-glomerulus}—FB_e→IDFP_{L-HB-lateral}				
 Cha-F-300116	 PB_{L1}	 FB_{L3e, L4e}	 IDFP_{L-HB-lateral}	$\text{PB}_{\text{L1}}\text{---FB}_{\text{L3e, L4e}}\rightarrow\text{IDFP}_{\text{L-HB-lateral}}\ (n=4)$
 Gad1-F-500065	 PB_{R1}	 FB_{L2e, L3e}	 IDFP_{L-HB-lateral}	$\text{PB}_{\text{R1}}\text{---FB}_{\text{L2e, L3e}}\rightarrow\text{IDFP}_{\text{L-HB-lateral}}\ (n=22)$
 Cha-F-500139	 PB_{R2}	 FB_{L1e, L2e}	 IDFP_{L-HB-lateral}	$\text{PB}_{\text{R2}}\text{---FB}_{\text{L1e, L2e}}\rightarrow\text{IDFP}_{\text{L-HB-lateral}}\ (n=1)$

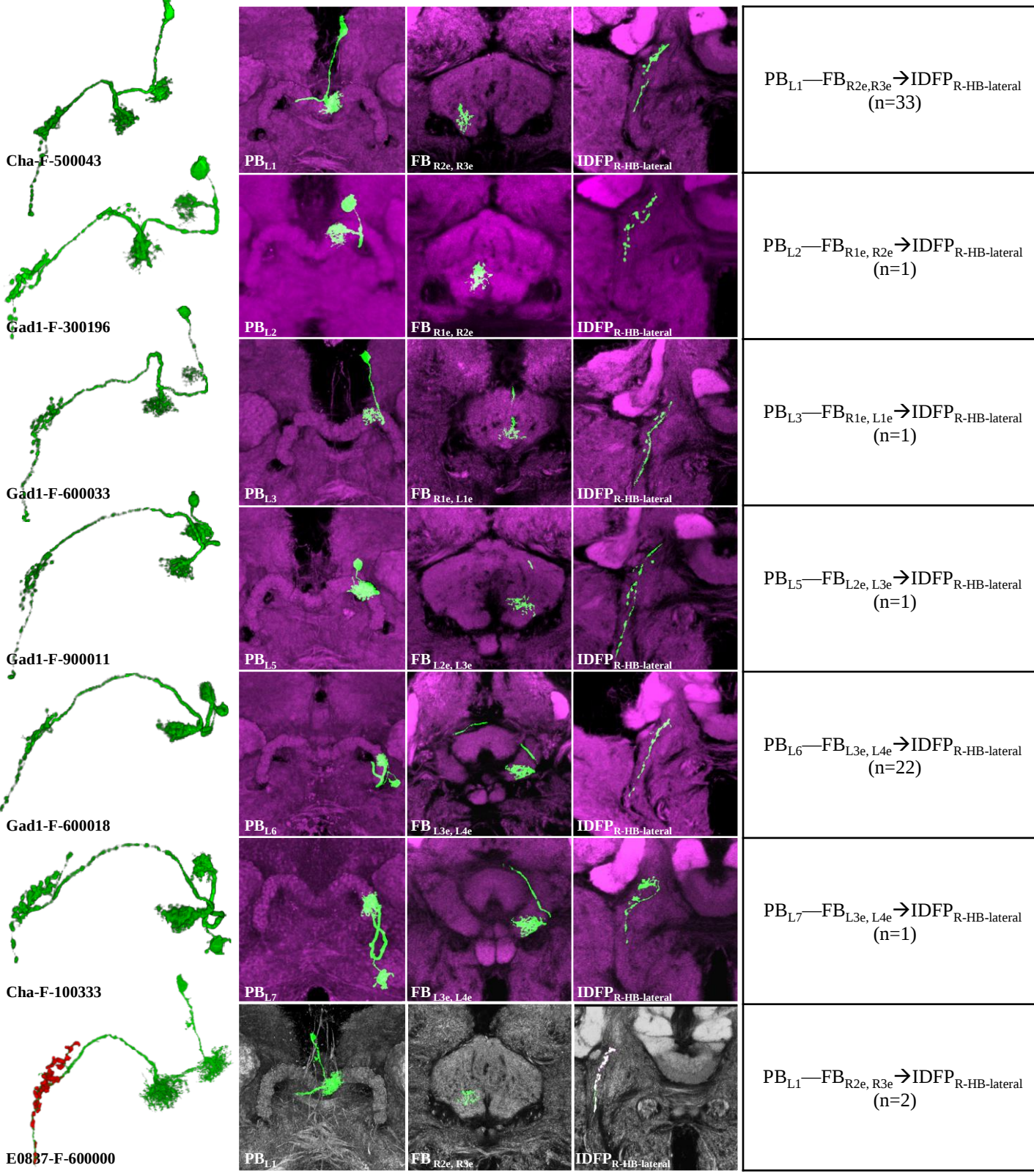


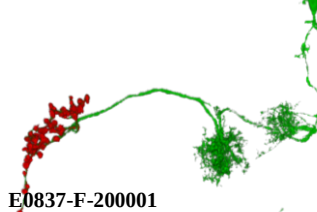
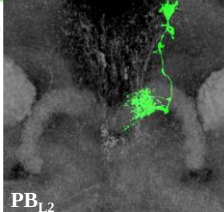
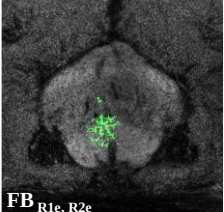
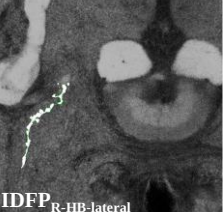
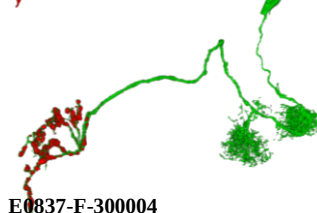
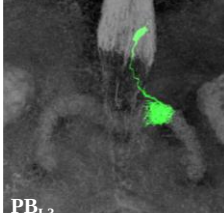
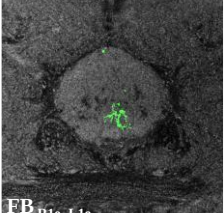
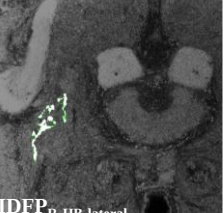
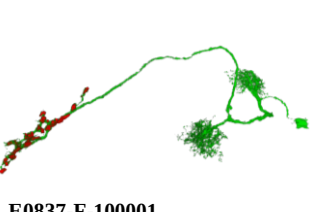
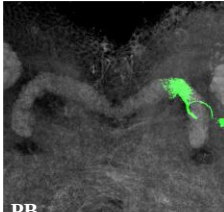
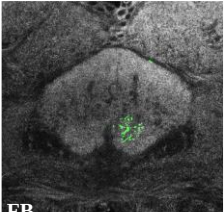
 Gad1-F-400017	 PB _{R3}	 FB _{R1c,d,e,f, R2c,d}	 IDFP _{L-HB-medial}	$\text{PB}_{\text{R3}} \text{---} \text{FB}_{\text{R1c,d,e,f, R2c,d}} \rightarrow \text{IDFP}_{\text{L-HB-medial}} \quad (n=2)$
 Cha-F-200207	 PB _{R4}	 FB _{R2c,d,e,f, R3c,d}	 IDFP _{L-HB-medial}	$\text{PB}_{\text{R4}} \text{---} \text{FB}_{\text{R2c,d,e,f, R3c,d}} \rightarrow \text{IDFP}_{\text{L-HB-medial}} \quad (n=1)$
 Cha-F-200363	 PB _{R5}	 FB _{R3c,d,e,f, R2c,d}	 IDFP _{L-HB-medial}	$\text{PB}_{\text{R5}} \text{---} \text{FB}_{\text{R3c,d,e,f, R2c,d}} \rightarrow \text{IDFP}_{\text{L-HB-medial}} \quad (n=4)$
 Gad1-F-200044	 PB _{R6}	 FB _{R4c,d,e,f, R3c,d}	 IDFP _{L-HB-medial}	$\text{PB}_{\text{R6}} \text{---} \text{FB}_{\text{R4c,d,e,f, R3c,d}} \rightarrow \text{IDFP}_{\text{L-HB-medial}} \quad (n=34)$
 E0837-F-200004	 PB _{L1}	 FB _{B_L4c,d,e,f, L3c,d}	 IDFP _{L-HB-medial}	$\text{PB}_{\text{L1}} \text{---} \text{FB}_{\text{L4c,d,e,f, L3c,d}} \rightarrow \text{IDFP}_{\text{L-HB-medial}} \quad (n=1)$
 E0837-F-000004	 PB _{R1}	 FB _{L2c,d,e,f, L1c,d}	 IDFP _{L-HB-medial}	$\text{PB}_{\text{R1}} \text{---} \text{FB}_{\text{L2c,d,e,f, L1c,d}} \rightarrow \text{IDFP}_{\text{L-HB-medial}} \quad (n=1)$
 E0837-F-200002	 PB _{R5}	 FB _{R3c,d,e,f, R2c,d}	 IDFP _{L-HB-medial}	$\text{PB}_{\text{R5}} \text{---} \text{FB}_{\text{R3c,d,e,f, R2c,d}} \rightarrow \text{IDFP}_{\text{L-HB-medial}} \quad (n=2)$
Class: PFI _R neurons Family: PB _{1-glomerulus} —FB _{c,d} →IDFP _{R-RB}				
 Tdc2-F-100002	 PB _{R1}	 FB _{R4c,d}	 IDFP _{R-RB}	$\text{PB}_{\text{R1}} \text{---} \text{FB}_{\text{R4c,d}} \rightarrow \text{IDFP}_{\text{R-RB}} \quad (n=2)$

 Tdc2-F-200047	 PB_{L1}	 FB_{R4c,d}	 IDFP_{R-RB}	PB_{L1}—FB_{R4c,d}→IDFP_{R-RB} (n=3)
 Tdc2-F-300026	 PB_{L2}	 FB_{R3c,d}	 IDFP_{R-RB}	PB_{L2}—FB_{R3c,d}→IDFP_{R-RB} (n=4)
 Tdc2-F-000035	 PB_{L3}	 FB_{R2c,d}	 IDFP_{R-RB}	PB_{L3}—FB_{R2c,d}→IDFP_{R-RB} (n=3)
 Tdc2-F-400014	 PB_{L4}	 FB_{R1c,d}	 IDFP_{R-RB}	PB_{L4}—FB_{R1c,d}→IDFP_{R-RB} (n=1)
 Tdc2-F-300008	 PB_{L4}	 FB_{L1c,d}	 IDFP_{R-RB}	PB_{L4}—FB_{L1c,d}→IDFP_{R-RB} (n=5)
 Tdc2-F-600000	 PB_{L5}	 FB_{L2c,d}	 IDFP_{R-RB}	PB_{L5}—FB_{L2c,d}→IDFP_{R-RB} (n=1)
 Tdc2-F-700000	 PB_{L6}	 FB_{L3c,d}	 IDFP_{R-RB}	PB_{L6}—FB_{L3c,d}→IDFP_{R-RB} (n=2)
Family: PB_{2-glomeruli}—FB_e→IDFP_{R-HB-lateral}				
 Gad1-F-500042	 PB_{R1,L1}	 FB_{R3e, R4e}	 IDFP_{R-HB-lateral}	PB_{R1,L1}—FB_{R3e,R4e}→IDFP_{R-HB-lateral} (n=23)

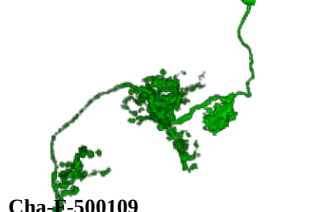
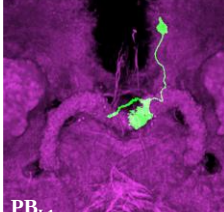
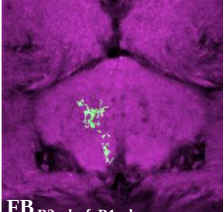
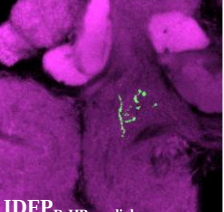
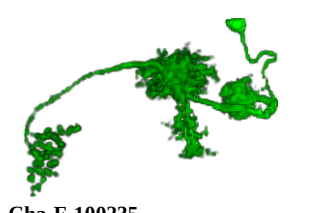
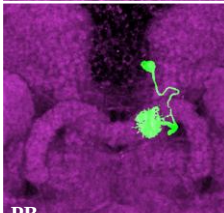
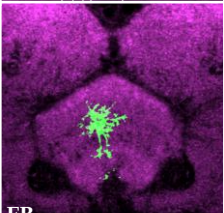
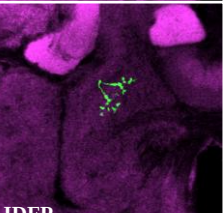
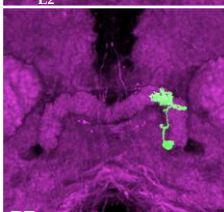
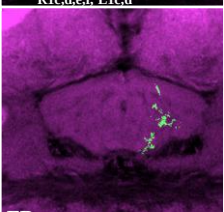
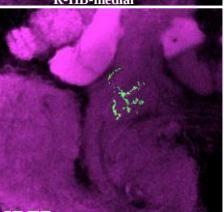
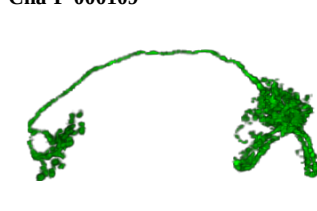
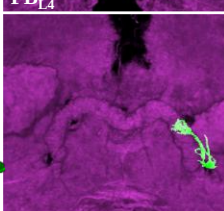
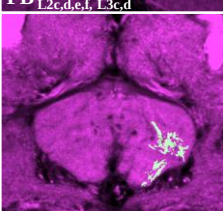
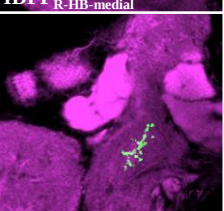
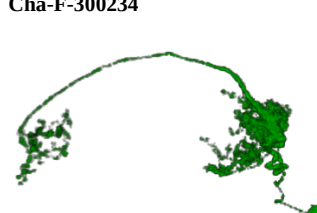
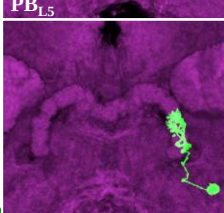
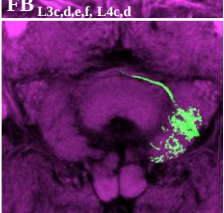
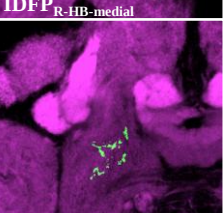


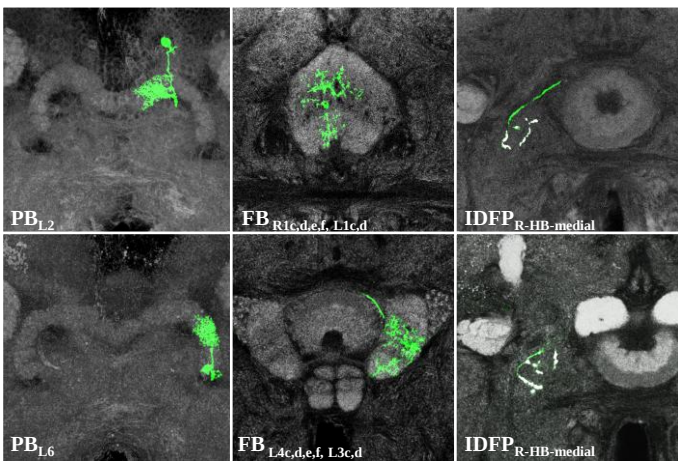
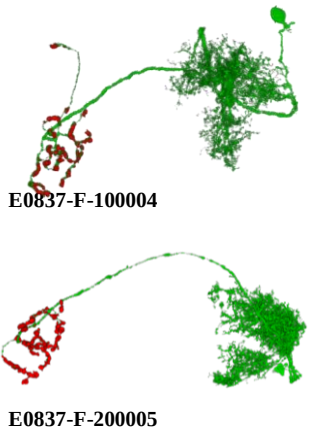
Family: PB_{1-glomerulus}—FB_e→IDFP_{R-HB-lateral}



 E0837-F-200001	 PB_{L2}	 FB_{R1e, R2e}	 IDFP_{R-HB-lateral}	$\text{PB}_{L2} \text{---} \text{FB}_{R1e, R2e} \rightarrow \text{IDFP}_{R\text{-HB-lateral}}$ (n=1)
 E0837-F-300004	 PB_{L3}	 FB_{R1e, L1e}	 IDFP_{R-HB-lateral}	$\text{PB}_{L3} \text{---} \text{FB}_{R1e, L1e} \rightarrow \text{IDFP}_{R\text{-HB-lateral}}$ (n=1)
 E0837-F-100001	 PB_{L4}	 FB_{L1e, L2e}	 IDFP_{R-HB-lateral}	$\text{PB}_{L4} \text{---} \text{FB}_{L1e, L2e} \rightarrow \text{IDFP}_{R\text{-HB-lateral}}$ (n=3)

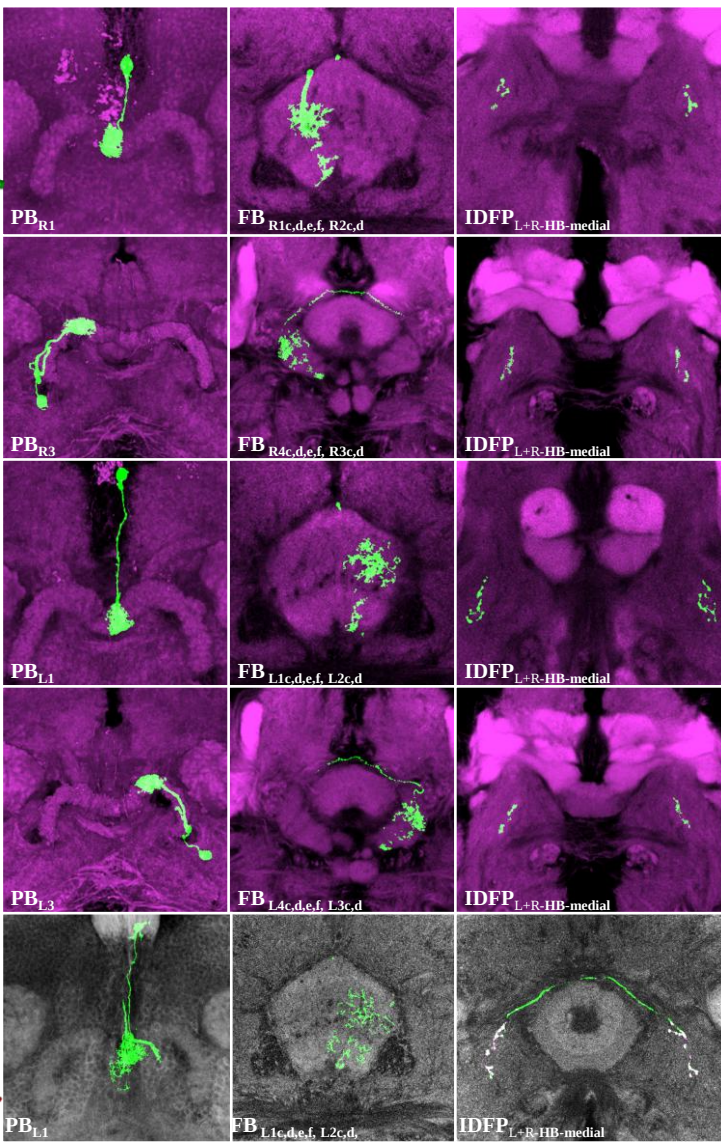
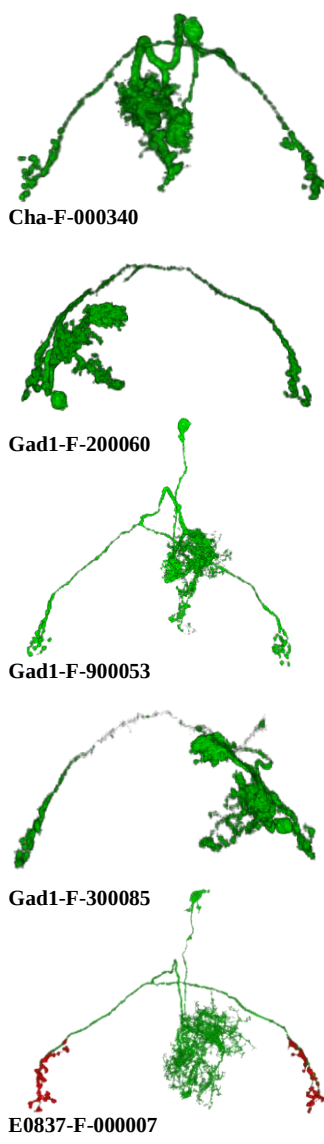
Family: PB_{1-glomerulus}—FB_{C,d,e,f}→IDFP_{R-HB-medial}

 Cha-F-500109	 PB_{L1}	 FB_{R2c,d,e,f, R1c,d}	 IDFP_{R-HB-medial}	$\text{PB}_{L1} \text{---} \text{FB}_{R2c,d,e,f, R1c,d} \rightarrow \text{IDFP}_{R\text{-HB-medial}}$ (n=2)
 Cha-F-100235	 PB_{L2}	 FB_{R1c,d,e,f, L1c,d}	 IDFP_{R-HB-medial}	$\text{PB}_{L2} \text{---} \text{FB}_{R1c,d,e,f, L1c,d} \rightarrow \text{IDFP}_{R\text{-HB-medial}}$ (n=3)
 Cha-F-000109	 PB_{L4}	 FB_{L2c,d,e,f, L3c,d}	 IDFP_{R-HB-medial}	$\text{PB}_{L4} \text{---} \text{FB}_{L2c,d,e,f, L3c,d} \rightarrow \text{IDFP}_{R\text{-HB-medial}}$ (n=3)
 Cha-F-300234	 PB_{L5}	 FB_{L3c,d,e,f, L4c,d}	 IDFP_{R-HB-medial}	$\text{PB}_{L5} \text{---} \text{FB}_{L3c,d,e,f, L4c,d} \rightarrow \text{IDFP}_{R\text{-HB-medial}}$ (n=2)
 Gad1-F-300063	 PB_{L6}	 FB_{L4c,d,e,f, L3c,d}	 IDFP_{R-HB-medial}	$\text{PB}_{L6} \text{---} \text{FB}_{L4c,d,e,f, L3c,d} \rightarrow \text{IDFP}_{R\text{-HB-medial}}$ (n=17)



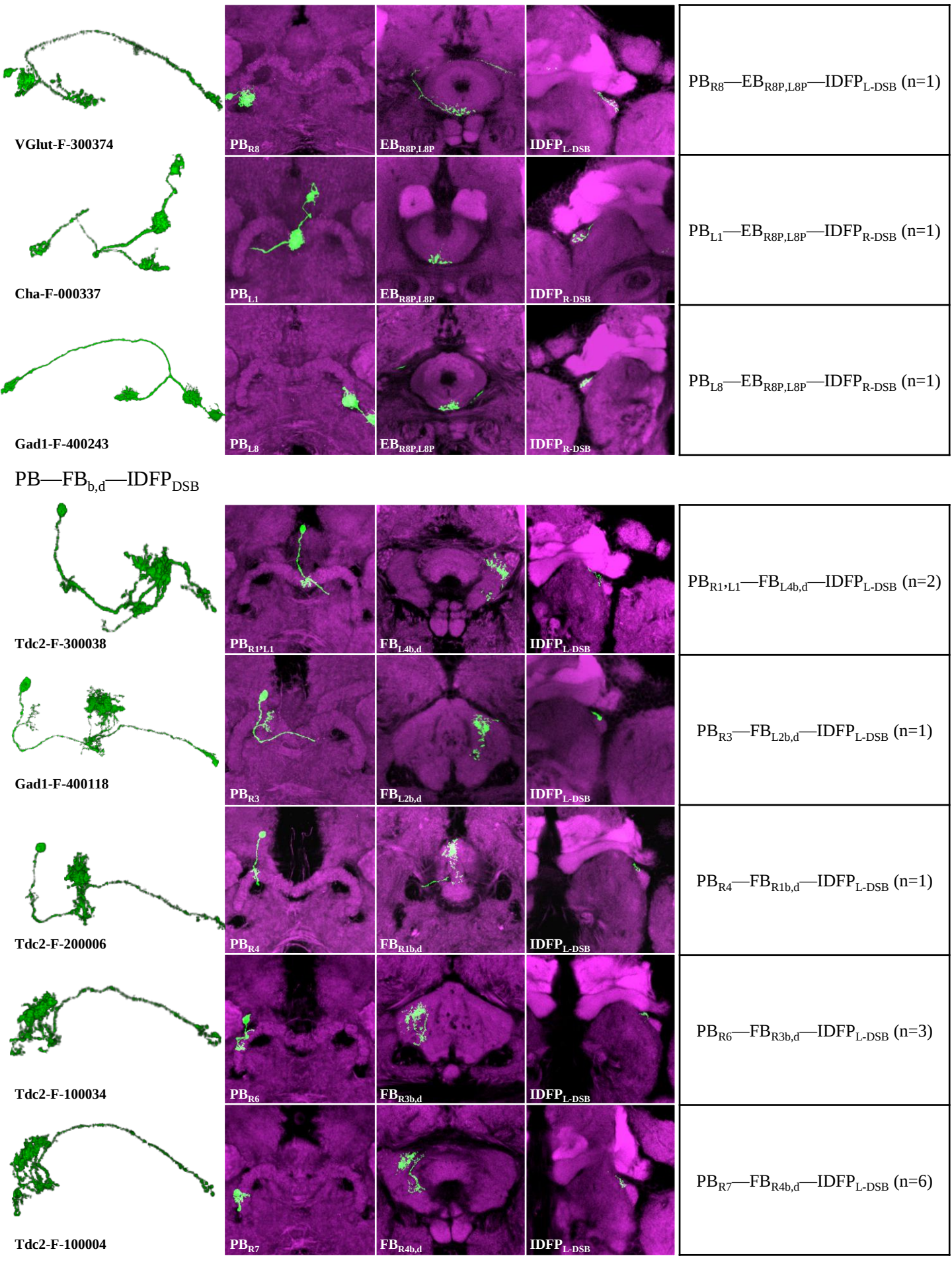
$PB_{L2} \text{---} FB_{R1c,d,e,f, L1c,d} \rightarrow IDFP_{R-HB-medial}$ (n=1)
$PB_{L6} \text{---} FB_{L4c,d,e,f, L3c,d} \rightarrow IDFP_{R-HB-medial}$ (n=1)

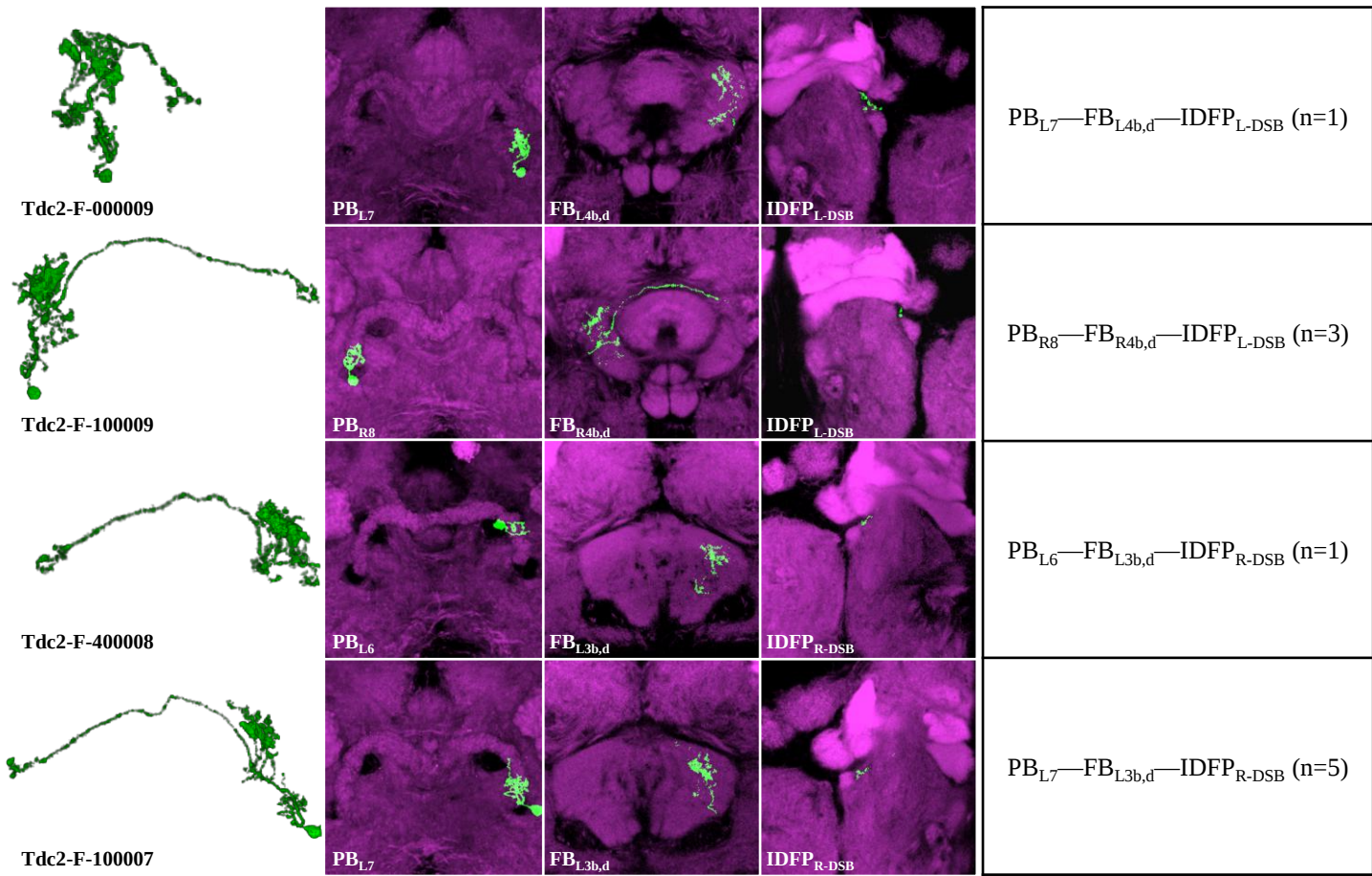
Class: PFI_{L+R} neurons
Family: PB_{1-glomerulus}—FB_{c,d,e,f}→IDFP_{L+R-HB-medial}



$PB_{R1} \text{---} FB_{R1c,d,e,f, R2c,d} \rightarrow IDFP_{L+R-HB-medial}$ (n=2)
$PB_{R3} \text{---} FB_{R4c,d,e,f, R3c,d} \rightarrow IDFP_{L+R-HB-medial}$ (n=14)
$PB_{L1} \text{---} FB_{L1c,d,e,f, L2c,d} \rightarrow IDFP_{L+R-HB-medial}$ (n=5)
$PB_{L3} \text{---} FB_{L4c,d,e,f, L3c,d} \rightarrow IDFP_{L+R-HB-medial}$ (n=22)
$PB_{L1} \text{---} FB_{L1c,d,e,f, L2c,d} \rightarrow IDFP_{L+R-HB-medial}$ (n=1)

E9
Polarity unidentified neurons
PB—EB_p—IDFP_{DSB}





F

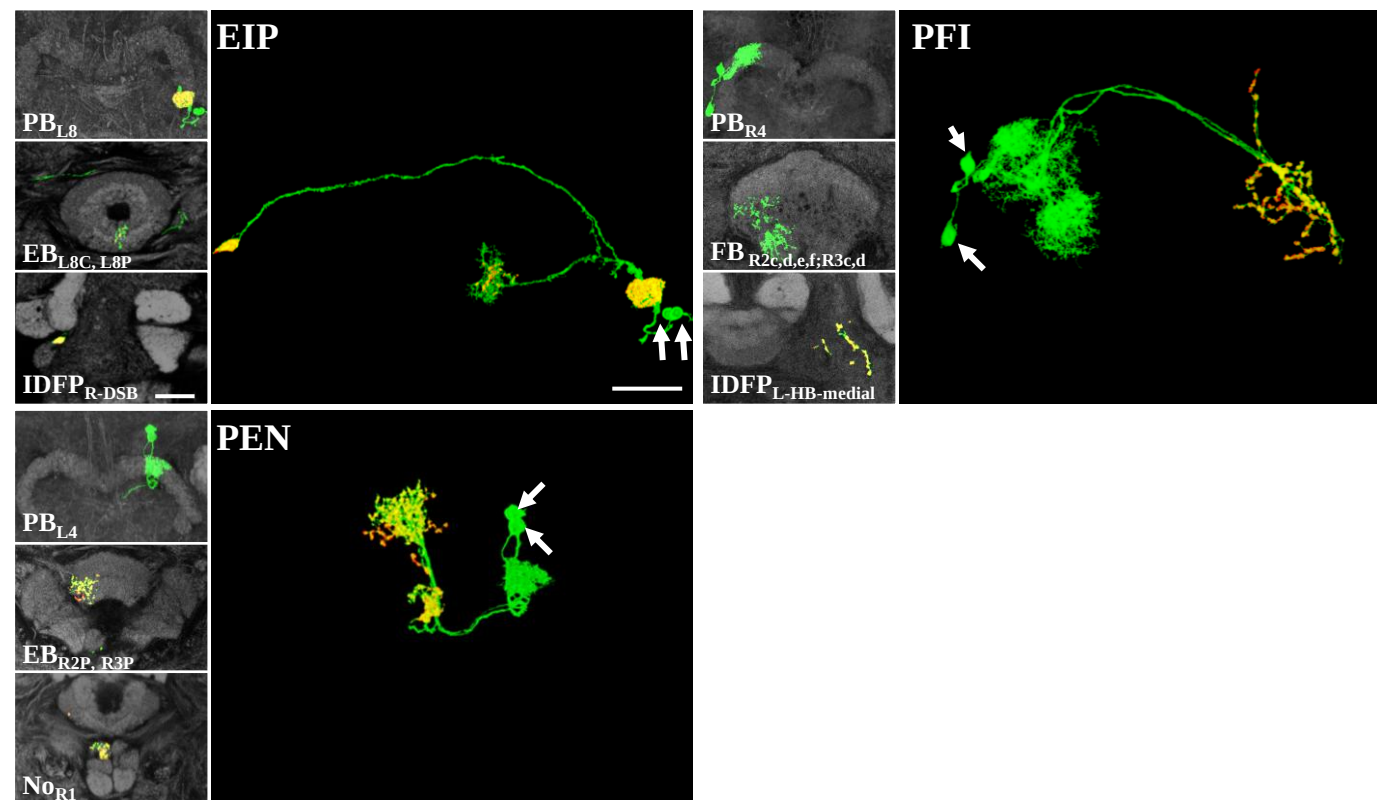
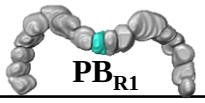
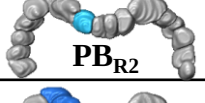
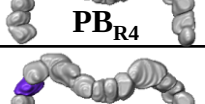
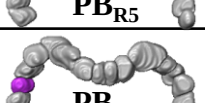
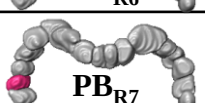
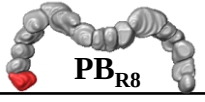
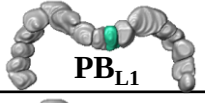
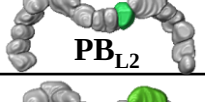
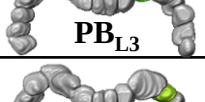
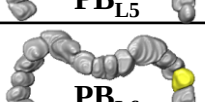
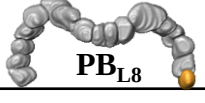
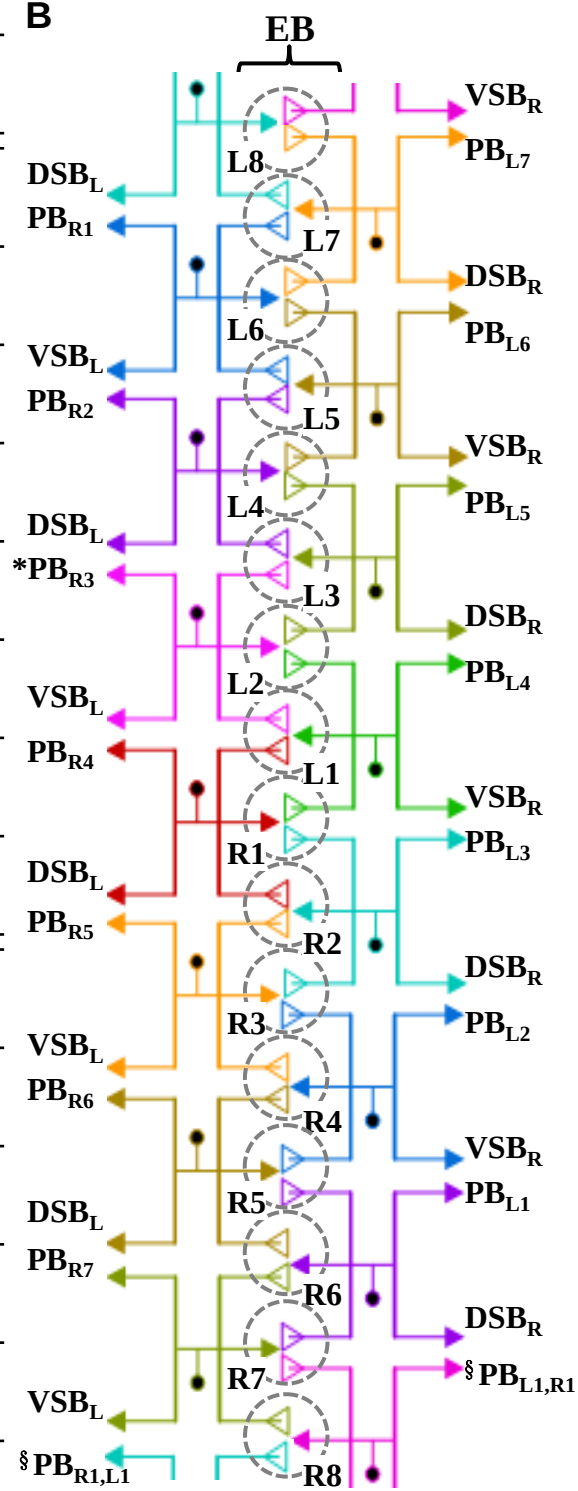


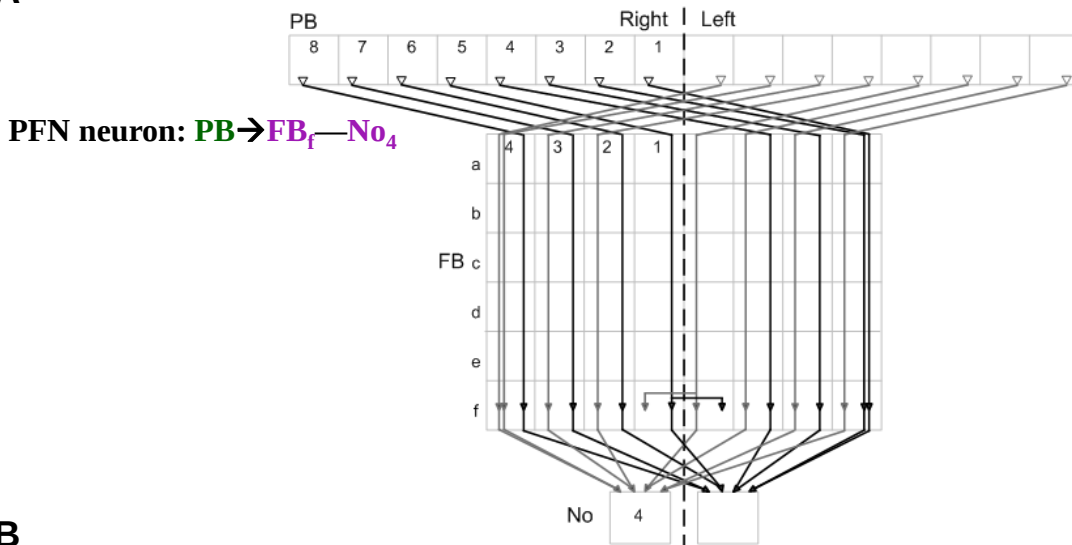
Figure S2. Characterization of *Gal4* Lines Used in Single Cell Analysis, Related to Figure 2

A

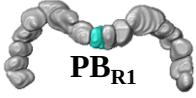
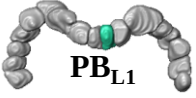
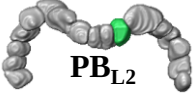
$\S EB_{R7C,O,P;L8C,O,P} \rightarrow EB_{R8C,O,P} - IDFP_{R-DSB} - PB_{L1,R1}$	
$\S EB_{L7C,O,P;R8C,O,P} \rightarrow EB_{L8C,O,P} - IDFP_{L-DSB} - PB_{R1,L1}$	
$EB_{L5C,O,P;L7C,O,P} \rightarrow EB_{L6C,O,P} - IDFP_{L-VSB} - PB_{R1}$	
$EB_{L3C,O,P;L5C,O,P} \rightarrow EB_{L4C,O,P} - IDFP_{L-DSB} - PB_{R2}$	
$*EB_{L1C,O,P;L3C,O,P} \rightarrow EB_{L2C,O,P} - IDFP_{L-VSB} - PB_{R3}$	
$EB_{R2C,O,P;L1C,O,P} \rightarrow EB_{R1C,O,P} - IDFP_{L-DSB} - PB_{R4}$	
$EB_{R4C,O,P;R2C,O,P} \rightarrow EB_{R3C,O,P} - IDFP_{L-VSB} - PB_{R5}$	
$EB_{R6C,O,P;R4C,O,P} \rightarrow EB_{R5C,O,P} - IDFP_{L-DSB} - PB_{R6}$	
$EB_{R8C,O,P;R6C,O,P} \rightarrow EB_{R7C,O,P} - IDFP_{L-VSB} - PB_{R7}$	
$EB_{R8C,P} \rightarrow EB_{R8C,P} - IDFP_{L-DSB} - PB_{R8}$	
$EB_{R5C,O,P;R7C,O,P} \rightarrow EB_{R6C,O,P} - IDFP_{R-VSB} - PB_{L1}$	
$EB_{R3C,O,P;R5C,O,P} \rightarrow EB_{R4C,O,P} - IDFP_{R-DSB} - PB_{L2}$	
$EB_{R1C,O,P;R3C,O,P} \rightarrow EB_{R2C,O,P} - IDFP_{R-VSB} - PB_{L3}$	
$EB_{L2C,O,P;R1C,O,P} \rightarrow EB_{L1C,O,P} - IDFP_{R-DSB} - PB_{L4}$	
$EB_{L4C,O,P;L2C,O,P} \rightarrow EB_{L3C,O,P} - IDFP_{R-VSB} - PB_{L5}$	
$EB_{L6C,O,P;L4C,O,P} \rightarrow EB_{L5C,O,P} - IDFP_{R-DSB} - PB_{L6}$	
$EB_{L8C,O,P;L6C,O,P} \rightarrow EB_{L7C,O,P} - IDFP_{R-VSB} - PB_{L7}$	
$EB_{L8C,P} \rightarrow EB_{L8C,P} - IDFP_{R-DSB} - PB_{L8}$	

B**Figure S3. EIP Circuits, Related to Figure 4**

A



B

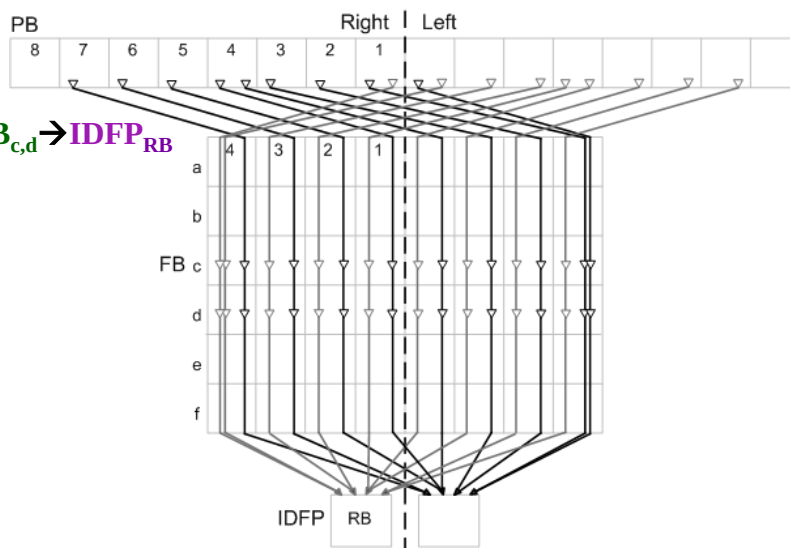
	$PB_{R1} \rightarrow EB_{L7C,L6C} \rightarrow IDFP_{L-DSB}$ $PB_{R1} \rightarrow EB_{R8P,L8P} \rightarrow No_{L1}$ $PB_{R1} \rightarrow FB_{L4d} \rightarrow No_{L2}$ $*PB_{R1} \rightarrow FB_{L4e} \rightarrow No_{L3}$ $*PB_{R1} \rightarrow FB_{L4f} \rightarrow No_{L4}$		$*PB_{L1} \rightarrow EB_{R7C,R6C} \rightarrow IDFP_{R-DSB}$ $PB_{L1} \rightarrow EB_{L8P,R8P} \rightarrow No_{R1}$ $PB_{L1} \rightarrow FB_{R4d} \rightarrow No_{R2}$ $*PB_{L1} \rightarrow FB_{R4e} \rightarrow No_{R3}$ $PB_{L1} \rightarrow FB_{R4f} \rightarrow No_{R4}$
	$*PB_{R2} \rightarrow EB_{L5C,L4C} \rightarrow IDFP_{L-DSB}$ $*PB_{R2} \rightarrow EB_{L7P,L6P} \rightarrow No_{L1}$ $*PB_{R2} \rightarrow FB_{L4d} \rightarrow No_{L2}$ $PB_{R2} \rightarrow FB_{L4e} \rightarrow No_{L3}$ $PB_{R2} \rightarrow FB_{L4f} \rightarrow No_{L4}$		$*PB_{L2} \rightarrow EB_{R5C,R4C} \rightarrow IDFP_{R-DSB}$ $PB_{L2} \rightarrow EB_{R7P,R6P} \rightarrow No_{R1}$ $PB_{L2} \rightarrow FB_{R4d} \rightarrow No_{R2}$ $PB_{L2} \rightarrow FB_{R4e} \rightarrow No_{R3}$ $PB_{L2} \rightarrow FB_{R4f} \rightarrow No_{R4}$
	$*PB_{R3} \rightarrow EB_{L3C,L2C} \rightarrow IDFP_{L-DSB}$ $PB_{R3} \rightarrow EB_{L5P,L4P} \rightarrow No_{L1}$ $PB_{R3} \rightarrow FB_{L3d} \rightarrow No_{L2}$ $PB_{R3} \rightarrow FB_{L3e} \rightarrow No_{L3}$ $PB_{R3} \rightarrow FB_{L3f} \rightarrow No_{L4}$		$*PB_{L3} \rightarrow EB_{R3C,R2C} \rightarrow IDFP_{R-DSB}$ $*PB_{L3} \rightarrow EB_{R5P,R4P} \rightarrow No_{R1}$ $PB_{L3} \rightarrow FB_{R3d} \rightarrow No_{R2}$ $PB_{L3} \rightarrow FB_{R3e} \rightarrow No_{R3}$ $PB_{L3} \rightarrow FB_{R3f} \rightarrow No_{R4}$
	$*PB_{R4} \rightarrow EB_{L1C,R1C} \rightarrow IDFP_{L-DSB}$ $*PB_{R4} \rightarrow EB_{L3P,L2P} \rightarrow No_{L1}$ $PB_{R4} \rightarrow FB_{L2d} \rightarrow No_{L2}$ $PB_{R4} \rightarrow FB_{L2e} \rightarrow No_{L3}$ $PB_{R4} \rightarrow FB_{L2f} \rightarrow No_{L4}$		$PB_{L4} \rightarrow EB_{R1C,L1C} \rightarrow IDFP_{R-DSB}$ $*PB_{L4} \rightarrow EB_{R3P,R2P} \rightarrow No_{R1}$ $*PB_{L4} \rightarrow FB_{R2d} \rightarrow No_{R2}$ $*PB_{L4} \rightarrow FB_{R2e} \rightarrow No_{R3}$ $PB_{L4} \rightarrow FB_{R2f} \rightarrow No_{R4}$
	$*PB_{R5} \rightarrow EB_{R2C,R3C} \rightarrow IDFP_{L-DSB}$ $PB_{R5} \rightarrow EB_{L1P,R1P} \rightarrow No_{L1}$ $PB_{R5} \rightarrow FB_{L1d,R1d} \rightarrow No_{L2}$ $PB_{R5} \rightarrow FB_{L1e,R1e} \rightarrow No_{L3}$ $PB_{R5} \rightarrow FB_{L1f,R1f} \rightarrow No_{L4}$		$PB_{L5} \rightarrow EB_{L2C,L3C} \rightarrow IDFP_{R-DSB}$ $PB_{L5} \rightarrow EB_{R1P,L1P} \rightarrow No_{R1}$ $PB_{L5} \rightarrow FB_{R1d,L1d} \rightarrow No_{R2}$ $*PB_{L5} \rightarrow FB_{R1e,L1e} \rightarrow No_{R3}$ $PB_{L5} \rightarrow FB_{R1f,L1f} \rightarrow No_{R4}$
	$PB_{R6} \rightarrow EB_{R4C,R5C} \rightarrow IDFP_{L-DSB}$ $PB_{R6} \rightarrow EB_{R2P,R3P} \rightarrow No_{L1}$ $*PB_{R6} \rightarrow FB_{R2d} \rightarrow No_{L2}$ $*PB_{R6} \rightarrow FB_{R2e} \rightarrow No_{L3}$ $*PB_{R6} \rightarrow FB_{R2f} \rightarrow No_{L4}$		$PB_{L6} \rightarrow EB_{L4C,L5C} \rightarrow IDFP_{R-DSB}$ $*PB_{L6} \rightarrow EB_{L2P,L3P} \rightarrow No_{R1}$ $*PB_{L6} \rightarrow FB_{L2d} \rightarrow No_{R2}$ $PB_{L6} \rightarrow FB_{L2e} \rightarrow No_{R3}$ $PB_{L6} \rightarrow FB_{L2f} \rightarrow No_{R4}$

 PB_{R7}	*PB_{R7}→EB_{R6C,R7C}—IDFP_{L-DSB}
	*PB_{R7}→EB_{R4P,R5P}—No_{L1}
	*PB_{R7}→FB_{R3d}—No_{L2}
	PB_{R7}→FB_{R3e}—No_{L3}
	PB_{R7}→FB_{R3f}—No_{L4}
 PB_{R8}	*PB_{R8}→EB_{R8C,L8C}—IDFP_{L-DSB}
	*PB_{R8}→EB_{R6P,R7P}—No_{L1}
	*PB_{R8}→FB_{R4d}—No_{L2}
	*PB_{R8}→FB_{R4e}—No_{L3}
	PB_{R8}→FB_{R4f}—No_{L4}

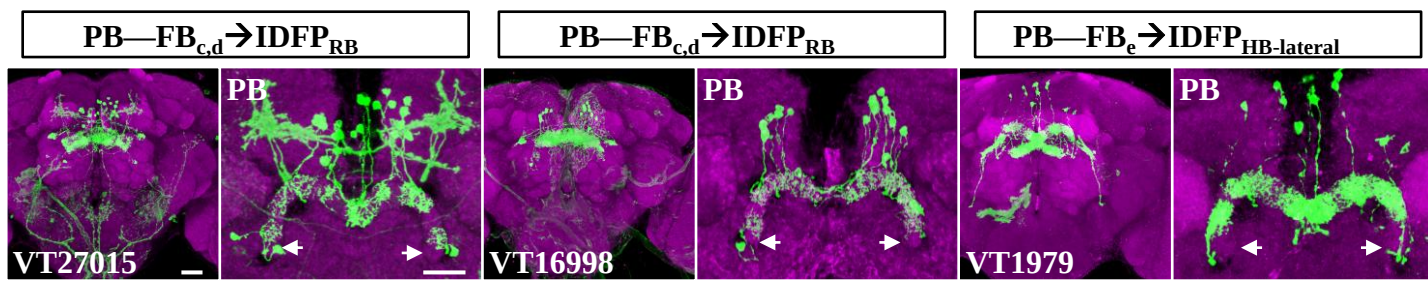
 PB_{L7}	PB_{L7}→EB_{L6C,L7C}—IDFP_{R-DSB}
	PB_{L7}→EB_{L4P,L5P}—No_{R1}
	*PB_{L7}→FB_{L3d}—No_{R2}
	PB_{L7}→FB_{L3e}—No_{R3}
	PB_{L7}→FB_{L3f}—No_{R4}
 PB_{L8}	PB_{L8}→EB_{L8C,R8C}—IDFP_{R-DSB}
	*PB_{L8}→EB_{L6P,L7P}—No_{R1}
	*PB_{L8}→FB_{L4d}—No_{R2}
	PB_{L8}→FB_{L4e}—No_{R3}
	PB_{L8}→FB_{L4f}—No_{R4}

Figure S4. PEI, PEN, and PFN Circuits, Related to Figure 5

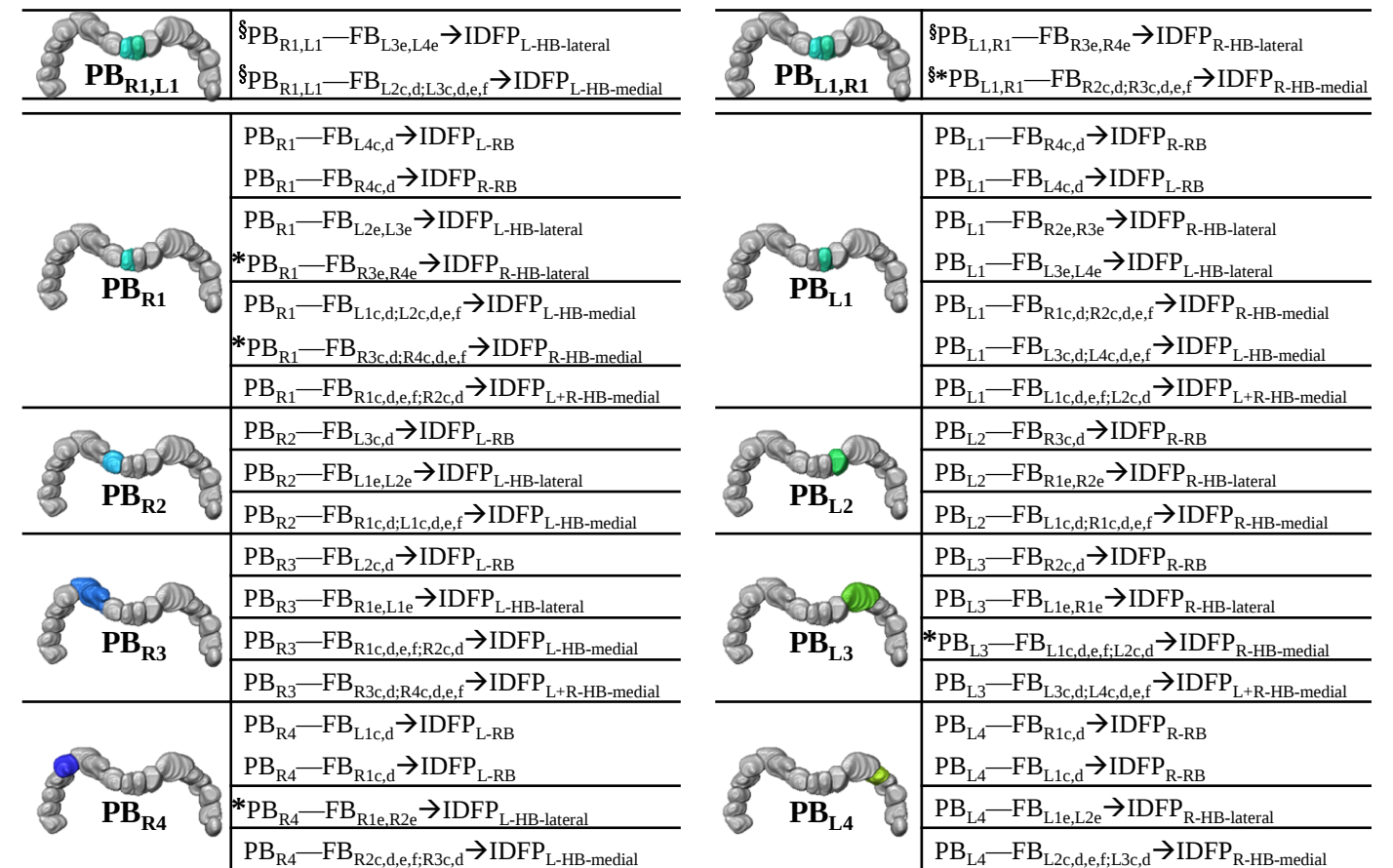
A

PFI neuron: PB—FB_{c,d}→IDFP_{RB}

B



C

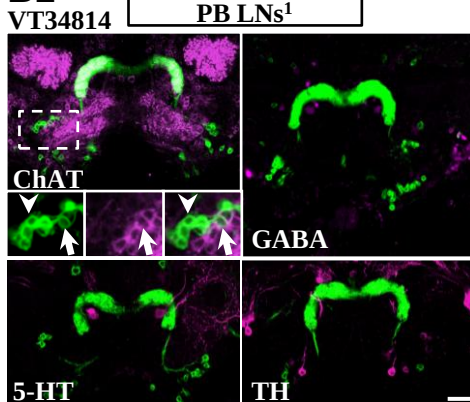
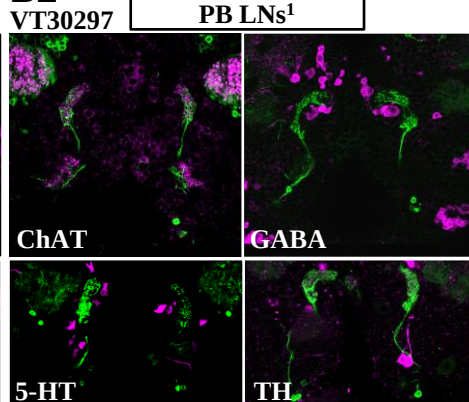
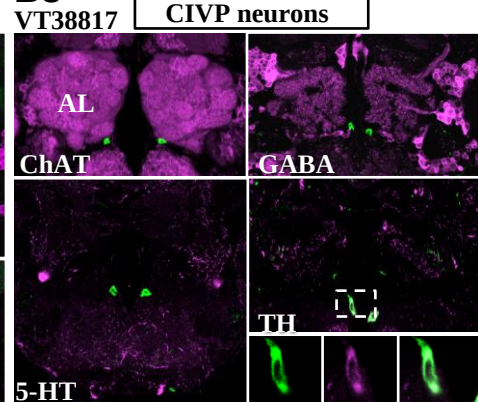
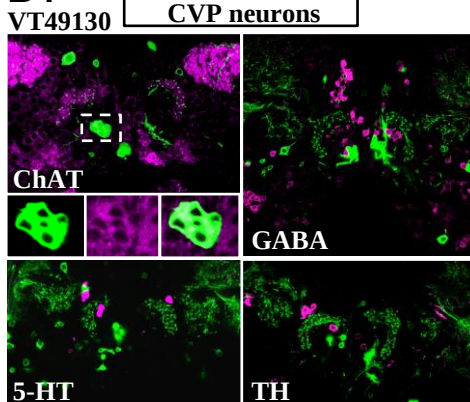
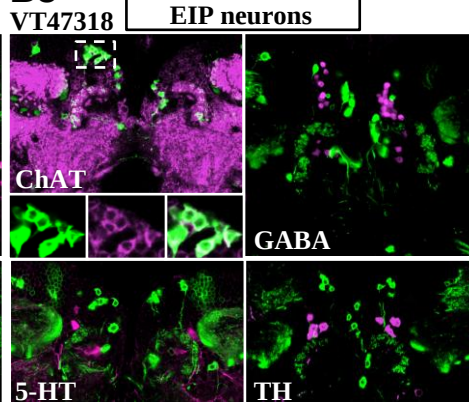
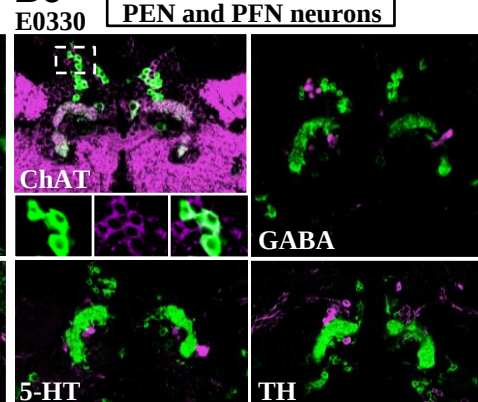
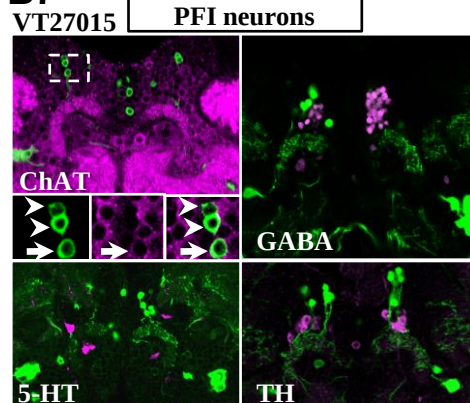
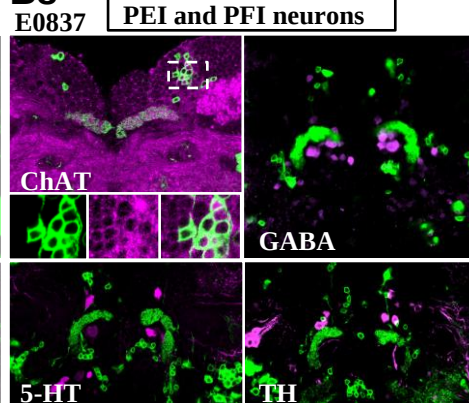


 PB_{R5}	PB _{R5} —FB _{R2c,d} →IDFP _{L-RB}
	*PB _{R5} —FB _{R2e,R3e} →IDFP _{L-HB-lateral}
	PB _{R5} —FB _{R3c,d,e,f;R4c,d} →IDFP _{L-HB-medial}
 PB_{R6}	PB _{R6} —FB _{R3c,d} →IDFP _{L-RB}
	PB _{R6} —FB _{R3e,R4e} →IDFP _{L-HB-lateral}
	PB _{R6} —FB _{R3c,d;R4c,d,e,f} →IDFP _{L-HB-medial}
 PB_{R7}	PB _{R7} —FB _{R4c,d} →IDFP _{L-RB}
	*PB _{R7} —FB _{R3e,R4e} →IDFP _{L-HB-lateral}
 PB_{R8}	Non
 PB_{L5}	PB _{L5} —FB _{L2c,d} →IDFP _{R-RB}
	PB _{L5} —FB _{L2e,L3e} →IDFP _{R-HB-lateral}
	PB _{L5} —FB _{L3c,d,e,f;L4c,d} →IDFP _{R-HB-medial}
 PB_{L6}	PB _{L6} —FB _{L3c,d} →IDFP _{R-RB}
	PB _{L6} —FB _{L3e,L4e} →IDFP _{R-HB-lateral}
	PB _{L6} —FB _{L3c,d;L4c,d,e,f} →IDFP _{R-HB-medial}
 PB_{L7}	*PB _{L7} —FB _{L4c,d} →IDFP _{R-RB}
	PB _{L7} —FB _{L3e,L4e} →IDFP _{R-HB-lateral}
 PB_{L8}	Non

Figure S5. PFI Circuits, Related to Figure 6

A

Neuron Type																
	PB _{R1}	PB _{L1}	PB _{R2}	PB _{L2}	PB _{R3}	PB _{L3}	PB _{R4}	PB _{L4}	PB _{R5}	PB _{L5}	PB _{R6}	PB _{L6}	PB _{R7}	PB _{L7}	PB _{R8}	PB _{L8}
LN ⁱⁿ	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2
LN ^{out}	6	6	7	7	8	8	8	8	8	8	8	8	7	7	4	4
PN ⁱⁿ	7	7	7	7	7	7	7	7	7	7	7	7	7	7	5	5
PN ^{out}	16	16	8	8	9	9	9	9	8	8	8	8	7	7	5	5
Sum	62		46		50		50		48		48		46		32	

B1**B2****B3****B4****B5****B6****B7****B8**

UAS-mCD8::GFP Anti- ChAT, GABA, 5-HT, or TH

C	<i>Drosophila</i>			Locust	
	Hanesch et al., 1989	Young and Armstrong, 2010	Current study	PB neurons	Function
Small field neurons					
eb-pb-vbo neuron	N.D.		EIP: EB→EB—IDFP—PB (Fig. 4)	CL1a: CBL→CBL—LAL—PB	POL ²
N.D.	N.D.		PEI: PB→EB—IDFP (Fig. 5)	CL1b/d: PB→CBL—LAL	POL ²
pb-eb-no neuron	N.D.		PEN: PB→EB—No (Fig. 5)	CL2: PB→CBL—No	Conditional POL ²
pb-fb-no neuron	pb-fb-no neuron		PFN: PB→FB—No (Fig. 5)	CPU4: PB→CBU—No	Conditional POL ²
pb-fb-vbo neuron	N.D.		PFI: PB→FB→IDFP (Fig. 6)	CPU1: PB→CBU→LAL	POL ³
N.D.	N.D.		PFI: PB→FB→IDFP _{R+L} (Fig. 6)	CPU2: PB→CBU→LAL _{R+L}	Conditional POL ²
pb-eb neuron	N.D.		N.D.	CL1c: PB→CBL	POL ²
pb-fb neuron	pb-fb neuron		N.D.	CPU3: PB→CBU	N.D.
pb-fb-eb neuron	N.D.		N.D.		N.D.
pb-eb-ltr neuron	N.D.		N.D.		N.D.
pb-no neuron	N.D.		N.D.		N.D.
Large field neurons					
PB/ neuron	PB/ neuron		PB LN (Fig. 3)		N.D.
N.D.	N.D.		CIVP: CVLP—IDFP—VMP→PB (Fig. 4)		N.D.
N.D.	N.D.		CVP: CCP—VMP→PB (Fig. 4)		N.D.
al-pb	N.D.		N.D.		N.D.
	N.D.			TB: PB→POTu	POL ^{4, 2}
	N.D.			CP1/2: PB→LAL	POL ³

D								
	Expression	Driver	Chromosome	Reference	Expression	Driver	Chromosome	Reference
	PB LN	VT30297	3	Current study		c547	3	Current study
	(PBI neuron)	VT34814	3	Current study		VT025526	3	Renn et al., 1999
		c465	2	Young and Armstrong, 2010b				Current study
	CVP neuron	VT49130	3	Current study	R4m ring neuron	c115	3	Renn et al., 1999
	CIVP neuron	VT38817	3	Current study		c346	X	Renn et al., 1999
	EIP neuron	VT47318	3	Current study		c819	3	Renn et al., 1999
	(eb-pb-vbo neuron)	E0585	2	Current study		c42	unknown	Renn et al., 1999
		E0330	4	Current study	R neuron*	64Y	3	Renn et al., 1999
	PEN neuron	c161	3	Renn et al., 1999		93Y	unknown	Renn et al., 1999
	(pb-eb-no neuron)	78Y	3	Renn et al., 1999		52y	3	Young and Armstrong, 2010b
		007Y	unknown	Renn et al., 1999	R4 ring neuron	c465	2	Young and Armstrong, 2010b
	PFN neuron	E0330	4	Current study	P ring neuron	VT5404	3	Current study
	(pb-fb-no neuron)	c465	2	Young and Armstrong, 2010b	Fm neuron	62y	2	Young and Armstrong, 2010b
	PEI neuron	E0837	3	Current study		71y	3	Young and Armstrong, 2010b
		VT27015	3	Current study	Fl neuron	62y	2	Young and Armstrong, 2010b
	PFI neuron	E0837	4	Current study		121y	unknown	Young and Armstrong, 2010b
	(pb-fb-vbo neuron)	VT16998	3	Current study	Fm1 neuron	227y	X	Young and Armstrong, 2010b
		VT1979	3	Current study	Fm2 neuron	c255	3	Young and Armstrong, 2010b
		c105	X	Current study		23y	2	Young and Armstrong, 2010b
	R1 ring neuron	VT39763	3	Current study		210y	3	Young and Armstrong, 2010b
		52y	3	Young and Armstrong, 2010b	Fm3 neuron	c61	X	Young and Armstrong, 2010b
		198Y	unknown	Renn et al., 1999		c259	unknown	Young and Armstrong, 2010b
		c547	3	Current study	ExF1 neuron	104y	2	Young and Armstrong, 2010b
		VT49921	3	Current study		NP6510	3	Young and Armstrong, 2010b
	R2 ring neuron	c465	2	Young and Armstrong, 2010b		23y	2	Young and Armstrong, 2010b
		EB1	unknown	Young and Armstrong, 2010b		71y	3	Young and Armstrong, 2010b
		c115	3	Renn et al., 1999		104y	2	Young and Armstrong, 2010b
		c346	X	Renn et al., 1999	ExF2 neuron	210y	3	Young and Armstrong, 2010b
		c819	3	Renn et al., 1999		227y	X	Young and Armstrong, 2010b
		c42	unknown	Renn et al., 1999		c5	3	Young and Armstrong, 2010b
		c232	3	Current study		c259	unknown	Young and Armstrong, 2010b
		VT42759	3	Current study	ExR1 neuron	71y	3	Young and Armstrong, 2010b
	R3 ring neuron	52y	3	Young and Armstrong, 2010b		c255	3	Young and Armstrong, 2010b
		189Y	2	Renn et al., 1999		52y	3	Young and Armstrong, 2010b
		c481	X	Renn et al., 1999	fb-eb neuron	c159b	2	Young and Armstrong, 2010b
		c507	3	Renn et al., 1999		c107	X	Renn et al., 1999
		c232	3	Current study	pb-fb neuron	210y	3	Young and Armstrong, 2010b
				Young and Armstrong, 2010b	fb-no neuron	c465	2	Young and Armstrong, 2010b
	R4d ring neuron	VT43679	3	Current study	Pontine neuron	NP2320	2	Young and Armstrong, 2010b
		c507	3	Renn et al., 1999	PPL1 neuron	c061	X	Kong et al., 2010
		pWF22-6	3	Renn et al., 1999		TH	3	Liu et al., 2012
				Young and Armstrong, 2010b				Mao and Davis, 2009
					PPM3 neuron	c346	X	Kong et al., 2010
						TH	3	Liu et al., 2012
					CC neurons	OK107	4	Yu et al., 2009
					DAL neuron	G0431	2	Chen et al., 2012

Figure S6. Characterization of PB Neurons, Related to Figure 7

SUPPLEMENTAL TABLES

Table S1. Abbreviations List, Related to Figure 1

AL	Antennal Lobe	EB _{R7P}	Right EB, 7 th sector, posterior ring	EB _{L7C}	Left EB, 7 th sector, central ring
CCP	Caudalcentral Protocerebrum	EB _{R8P}	Right EB, 8 th sector, posterior ring	EB _{L8C}	Left EB, 8 th sector, central ring
CVLP	Caudal Ventrolateral Protocerebrum	EB _{R1C}	Right EB, 1 st sector, central ring	EB _{L1O}	Left EB, 1 st sector, outer ring
DLP	Dorsolateral Protocerebrum	EB _{R2C}	Right EB, 2 nd sector, central ring	EB _{L2O}	Left EB, 2 nd sector, outer ring
DSB	Dorsal Spindle Body	EB _{R3C}	Right EB, 3 rd sector, central ring	EB _{L3O}	Left EB, 3 rd sector, outer ring
EB	Ellipsoid Body	EB _{R4C}	Right EB, 4 th sector, central ring	EB _{L4O}	Left EB, 4 th sector, outer ring
EB _A	EB, anterior ring	EB _{R5C}	Right EB, 5 th sector, central ring	EB _{L5O}	Left EB, 5 th sector, outer ring
EB _C	EB, central ring	EB _{R6C}	Right EB, 6 th sector, central ring	EB _{L6O}	Left EB, 6 th sector, outer ring
EB _O	EB, outer ring	EB _{R7C}	Right EB, 7 th sector, central ring	EB _{L7O}	Left EB, 7 th sector, outer ring
EB _P	EB, posterior ring	EB _{R8C}	Right EB, 8 th sector, central ring	EB _{L8O}	Left EB, 8 th sector, outer ring
EB _{R1A}	Right EB, 1 st sector, anterior ring	EB _{R1O}	Right EB, 1 st sector, outer ring	EB _{L1P}	Left EB, 1 st sector, posterior ring
EB _{R2A}	Right EB, 2 nd sector, anterior ring	EB _{R2O}	Right EB, 2 nd sector, outer ring	EB _{L2P}	Left EB, 2 nd sector, posterior ring
EB _{R3A}	Right EB, 3 rd sector, anterior ring	EB _{R3O}	Right EB, 3 rd sector, outer ring	EB _{L3P}	Left EB, 3 rd sector, posterior ring
EB _{R4A}	Right EB,4 th sector, anterior ring	EB _{R4O}	Right EB, 4 th sector, outer ring	EB _{L4P}	Left EB, 4 th sector, posterior ring
EB _{R5A}	Right EB, 5 th sector, anterior ring	EB _{R5O}	Right EB, 5 th sector, outer ring	EB _{L5P}	Left EB, 5 th sector, posterior ring
EB _{R6A}	Right EB, 6 th sector, anterior ring	EB _{R6O}	Right EB, 6 th sector, outer ring	EB _{L6P}	Left EB, 6 th sector, posterior ring
EB _{R7A}	Right EB, 7 th sector, anterior ring	EB _{R7O}	Right EB, 7 th sector, outer ring	EB _{L7P}	Left EB, 7 th sector, posterior ring
EB _{R8A}	Right EB, 8 th sector, anterior ring	EB _{R8O}	Right EB, 8 th sector, outer ring	EB _{L8P}	Left EB, 8 th sector, posterior ring
EB _{R1C}	Right EB, 1 st sector, central ring	EB _{R1P}	Right EB, 1 st sector, posterior ring	FB	Fan-shaped Body
EB _{R2C}	Right EB, 2 nd sector, central ring	EB _{R2P}	Right EB, 2 nd sector, posterior ring	FB _a	FB, a layer
EB _{R3C}	Right EB, 3 rd sector, central ring	EB _{R3P}	Right EB, 3 rd sector, posterior ring	FB _b	FB, b layer
EB _{R4C}	Right EB, 4 th sector, central ring	EB _{R4P}	Right EB, 4 th sector, posterior ring	FB _c	FB, c layer
EB _{R5C}	Right EB, 5 th sector, central ring	EB _{R5P}	Right EB, 5 th sector, posterior ring	FB _d	FB, d layer
EB _{R6C}	Right EB, 6 th sector, central ring	EB _{R6P}	Right EB, 6 th sector, posterior ring	FB _e	FB, e layer
EB _{R7C}	Right EB, 7 th sector, central ring	EB _{R7P}	Right EB, 7 th sector, posterior ring	FB _f	FB, f layer
EB _{R8C}	Right EB, 8 th sector, central ring	EB _{R8P}	Right EB, 8 th sector, posterior ring	FB _{R1a}	Right FB, 1 st column, a layer
EB _{R1O}	Right EB, 1 st sector, outer ring	EB _{L1A}	Left EB, 1 st sector, anterior ring	FB _{R2a}	Right FB, 2 nd column, a layer
EB _{R2O}	Right EB, 2 nd sector, outer ring	EB _{L2A}	Left EB, 2 nd sector, anterior ring	FB _{R3a}	Right FB, 3 rd column, a layer
EB _{R3O}	Right EB, 3 rd sector, outer ring	EB _{L3A}	Left EB, 3 rd sector, anterior ring	FB _{R4a}	Right FB, 4 th column, a layer
EB _{R4O}	Right EB, 4 th sector, outer ring	EB _{L4A}	Left EB,4 th sector, anterior ring	FB _{R1b}	Right FB, 1 st column, b layer
EB _{R5O}	Right EB, 5 th sector, outer ring	EB _{L5A}	Left EB, 5 th sector, anterior ring	FB _{R2b}	Right FB, 2 nd column, b layer
EB _{R6O}	Right EB, 6 th sector, outer ring	EB _{L6A}	Left EB, 6 th sector, anterior ring	FB _{R3b}	Right FB, 3 rd column, b layer
EB _{R7O}	Right EB, 7 th sector, outer ring	EB _{L7A}	Left EB, 7 th sector, anterior ring	FB _{R4b}	Right FB, 4 th column, b layer
EB _{R8O}	Right EB, 8 th sector, outer ring	EB _{L8A}	Left EB, 8 th sector, anterior ring	FB _{R1c}	Right FB, 1 st column, c layer
EB _{R1P}	Right EB, 1 st sector, posterior ring	EB _{L1C}	Left EB, 1 st sector, central ring	FB _{R2c}	Right FB, 2 nd column, c layer
EB _{R2P}	Right EB, 2 nd sector, posterior ring	EB _{L2C}	Left EB, 2 nd sector, central ring	FB _{R3c}	Right FB, 3 rd column, c layer
EB _{R3P}	Right EB, 3 rd sector, posterior ring	EB _{L3C}	Left EB, 3 rd sector, central ring	FB _{R4c}	Right FB, 4 th column, c layer
EB _{R4P}	Right EB, 4 th sector, posterior ring	EB _{L4C}	Left EB, 4 th sector, central ring	FB _{R1d}	Right FB, 1 st column, d layer
EB _{R5P}	Right EB, 5 th sector, posterior ring	EB _{L5C}	Left EB, 5 th sector, central ring	FB _{R2d}	Right FB, 2 nd column, d layer
EB _{R6P}	Right EB, 6 th sector, posterior ring	EB _{L6C}	Left EB, 6 th sector, central ring	FB _{R3d}	Right FB, 3 rd column, d layer

FB_{R4d}	Right FB, 4 th column, d layer	FB_{L2f}	Left FB, 2 nd column, f layer	No_{L1}	Left No, 1 st layer
FB_{R1e}	Right FB, 1 st column, e layer	FB_{L3f}	Left FB, 3 rd column, f layer	No_{L2}	Left No, 2 nd layer
FB_{R2e}	Right FB, 2 nd column, e layer	FB_{L4f}	Left FB, 4 th column, f layer	No_{L3}	Left No, 3 rd layer
FB_{R3e}	Right FB, 3 rd column, e layer	HB	Hammer Body	No_{L4}	Left No, 4 th layer
FB_{R4e}	Right FB, 4 th column, e layer	IDFP	Inferior Dorsofrontal Protocerebrum	OPTU	Optic Tubercle
FB_{R1f}	Right FB, 1 st column, f layer	IDFP_{R-DSB}	Right IDFP, dorsal spindle body	PB	Protocerebral Bridge
FB_{R2f}	Right FB, 2 nd column, f layer	IDFP_{R-VSB}	Right IDFP, ventral spindle body	PB_{R1}	Right PB, 1 st glomerulus
FB_{R3f}	Right FB, 3 rd column, f layer	IDFP_{R-RB}	Right IDFP, round body	PB_{R2}	Right PB, 2 nd glomerulus
FB_{R4f}	Right FB, 4 th column, f layer	IDFP_{R-HB-lateral}	Right IDFP, lateral ventral body	PB_{R3}	Right PB, 3 rd glomerulus
FB_{L1a}	Left FB, 1 st column, a layer	IDFP_{R-HB-medial}	Right IDFP, medial ventral body	PB_{R4}	Right PB, 4 th glomerulus
FB_{L2a}	Left FB, 2 nd column, a layer	IDFP_{L-DSB}	Left IDFP, dorsal spindle body	PB_{R5}	Right PB, 5 th glomerulus
FB_{L3a}	Left FB, 3 rd column, a layer	IDFP_{L-VSB}	Left side IDFP ventral spindle body	PB_{R6}	Right PB, 6 th glomerulus
FB_{L4a}	Left FB, 4 th column, a layer	IDFP_{L-RB}	Left IDFP, round body	PB_{R7}	Right PB, 7 th glomerulus
FB_{L1b}	Left FB, 1 st column, b layer	IDFP_{L-HB-lateral}	Left IDFP, lateral ventral body	PB_{R8}	Right PB, 8 th glomerulus
FB_{L2b}	Left FB, 2 nd column, b layer	IDFP_{L-HB-medial}	Left IDFP, medial ventral body	PB_{L1}	Left PB, 1 st glomerulus
FB_{L3b}	Left FB, 3 rd column, b layer	LT	Lateral Triangle	PB_{L2}	Left PB, 2 nd glomerulus
FB_{L4b}	Left FB, 4 th column, b layer	LT_R	Right LT	PB_{L3}	Left PB, 3 rd glomerulus
FB_{L1c}	Left FB, 1 st column, c layer	LT_L	Left LT	PB_{L4}	Left PB, 4 th glomerulus
FB_{L2c}	Left FB, 2 nd column, c layer	MB	Mushroom Body	PB_{L5}	Left PB, 5 th glomerulus
FB_{L3c}	Left FB, 3 rd column, c layer	Med	Medulla	PB_{L6}	Left PB, 6 th glomerulus
FB_{L4c}	Left FB, 4 th column, c layer	No	Noduli	PB_{L7}	Left PB, 7 th glomerulus
FB_{L1d}	Left FB, 1 st column, d layer	No₁	No, 1 st layer	PB_{L8}	Left PB, 8 th glomerulus
FB_{L2d}	Left FB, 2 nd column, d layer	No₂	No, 2 nd layer	RB	Round Body
FB_{L3d}	Left FB, 3 rd column, d layer	No₃	No, 3 rd layer	SDFP	Superior Dorsofrontal Protocerebrum
FB_{L4d}	Left FB, 4 th column, d layer	No₄	No, 4 th layer	SOG	Subesophageal Ganglion
FB_{L1e}	Left FB, 1 st column, e layer	No_{R1}	Right No, 1 st layer	VLP	Ventrolateral Protocerebrum
FB_{L2e}	Left FB, 2 nd column, e layer	No_{R2}	Right No, 2 nd layer	VMP	Ventrolmedial Protocerebrum
FB_{L3e}	Left FB, 3 rd column, e layer	No_{R3}	Right No, 3 rd layer	VSB	Ventral Spindle Body
FB_{L1f}	Left FB, 1 st column, f layer	No_{R4}	Right No, 4 th layer		