The Drosophila neuroanatomy ontology

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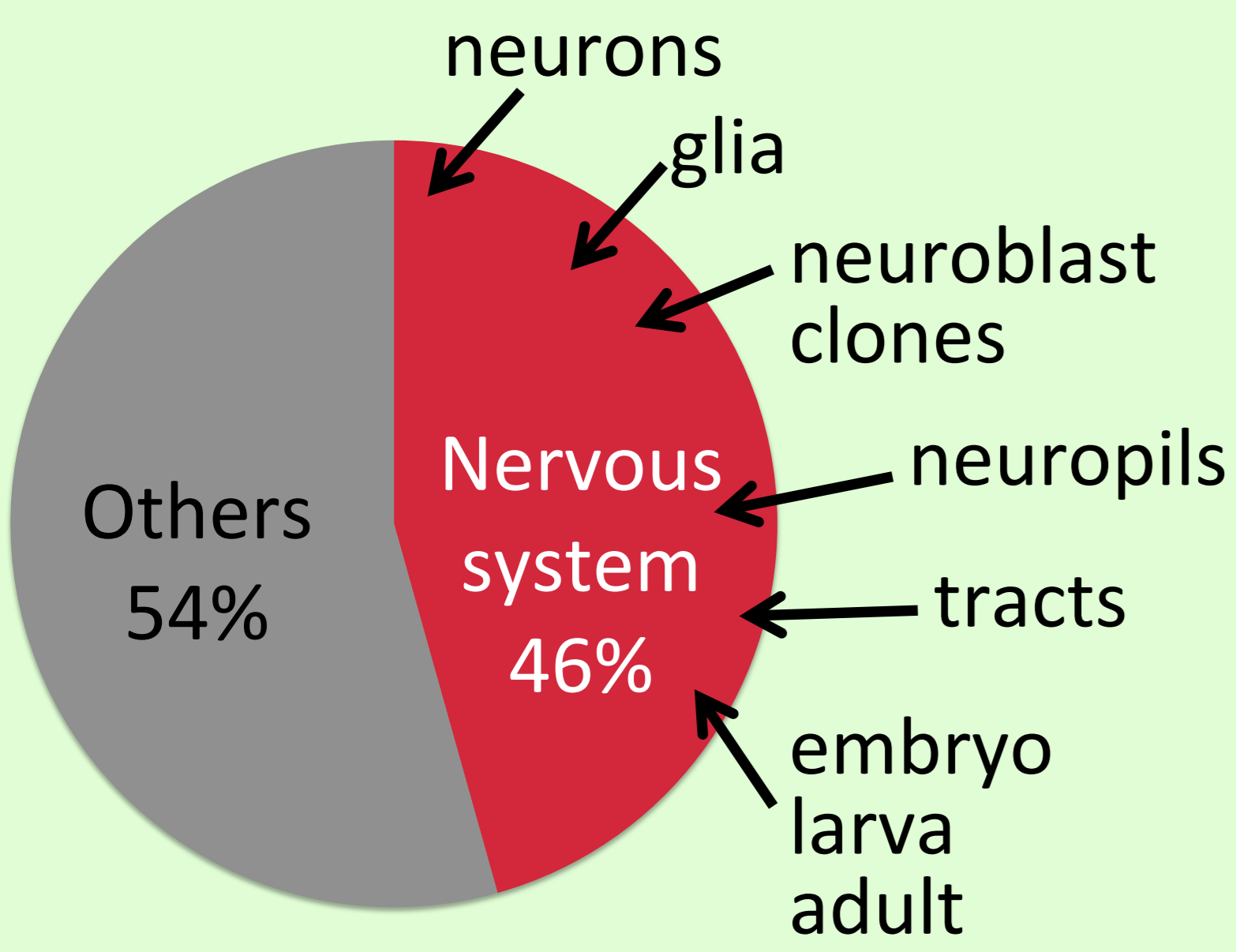
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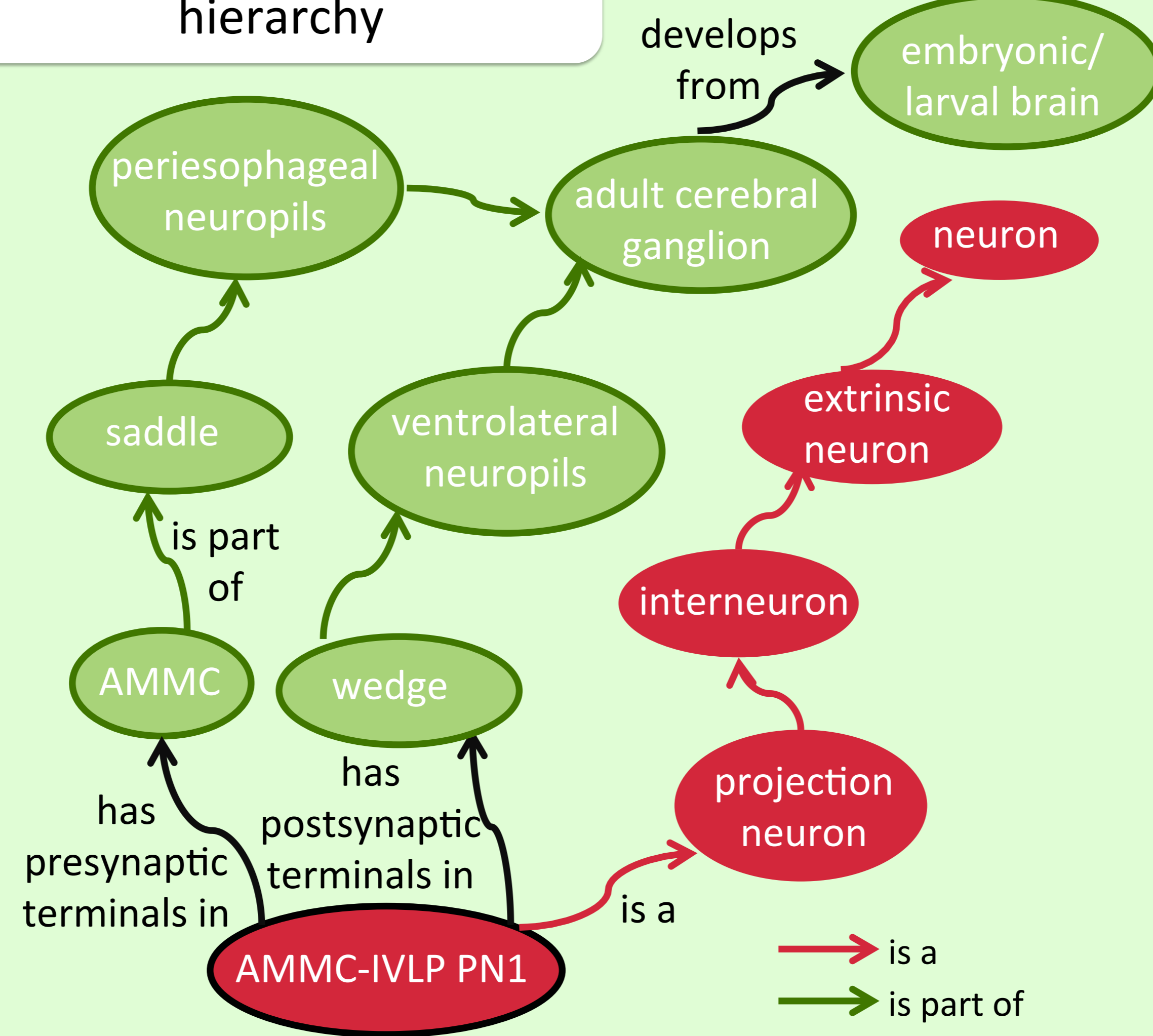Contact: m.costa@gen.cam.ac.uk

1. What is it?

The Drosophila anatomy ontology (DAO) is an organised set of terms describing the wild-type anatomy of *Drosophila melanogaster.* Recent work has focused on the neuroanatomy.

New anatomy terms are extracted from the literature

Neuroanatomy terms now represent almost half of all DAO terms

Each term is part of a rich hierarchy

Broughton S J et al. PNAS 2005; 102:3105-3110
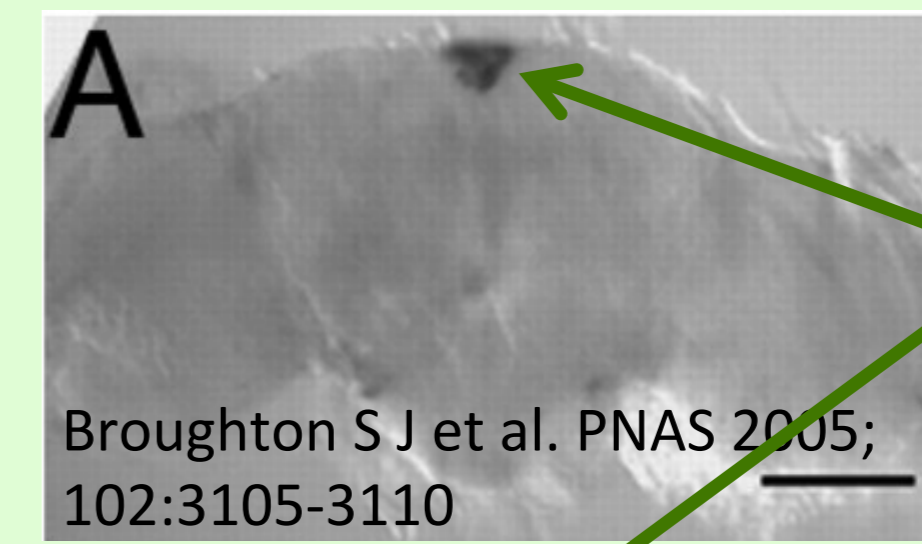
Term: adult dorsomedial neurosecretory cell
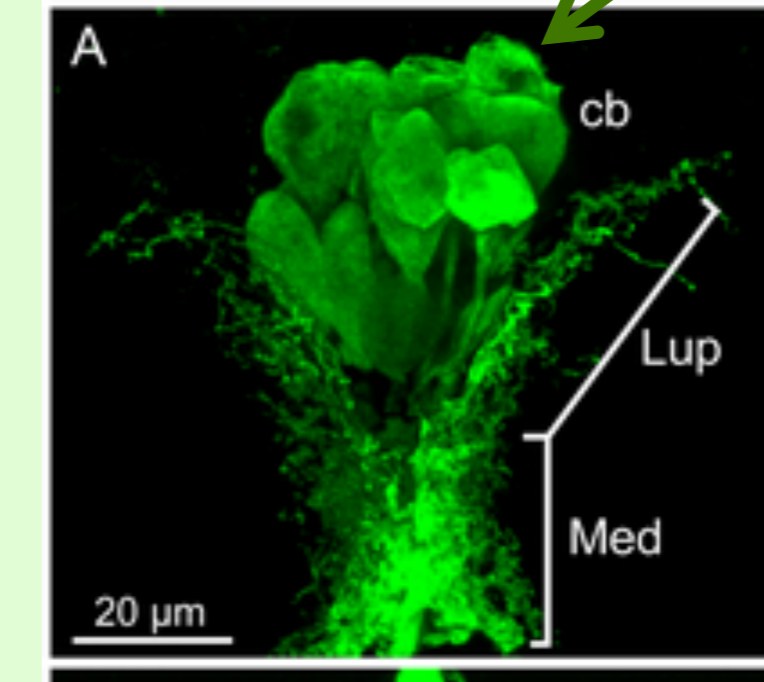
Definition: Neurosecretory cell of the pars intercerebralis that innervates the corpus cardiacum and corpus allatum, and branch before exiting the brain. It extends …

Synonyms: IPC cell, m-NSC, median neurosecretory cell

Morphology details:
- soma location
- innervation
- which neuropils it overlaps

Total : 8426 terms
217 lineage clones
2170 neuron types
156 tracts

Others 54%

Nervous system 46%

neurons
glia
neuroblast clones
neuropils
tracts
embryo larva adult

develops from embryonic/larval brain

periesophageal neuropils → adult cerebral ganglion → neuron

saddle, ventrolateral neuropils, extrinsic neuron

is part of

AMMC, wedge, interneuron

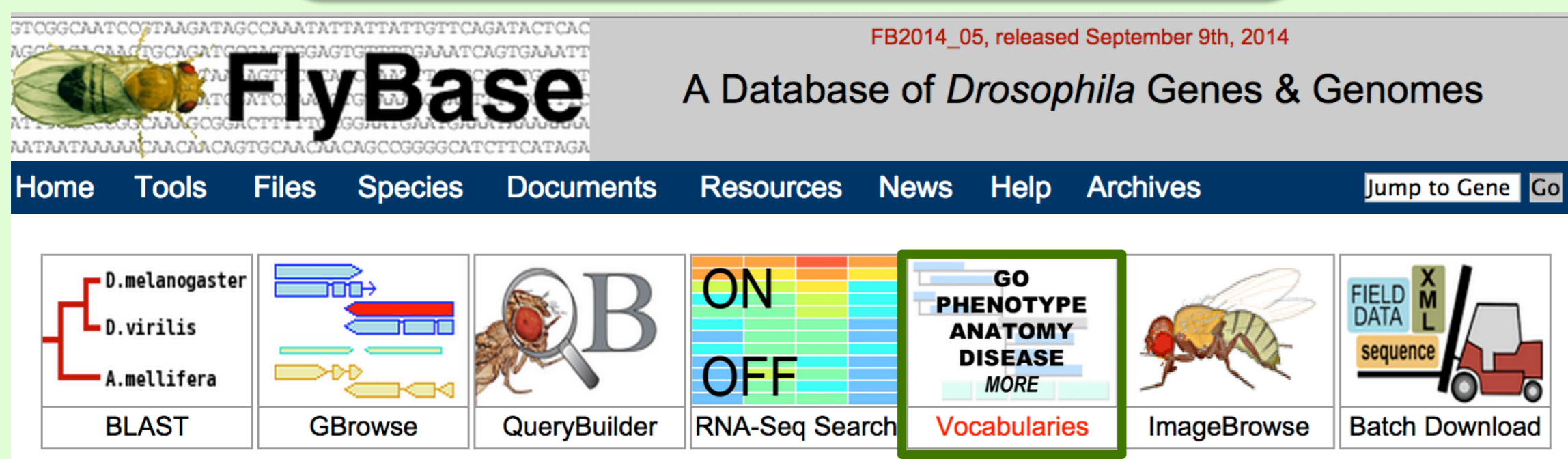has presynaptic terminals in, has postsynaptic terminals in, projection neuron, is a

AMMC-IVLP PN1

→ is a
→ is part of

Eg. the antennal mechanosensory and motor centre AMMC-IVLP projection neuron 1 (AMMC-IVLP PN1; Lai et al., 2012)

Enell LE, Kapan N, Söderberg JAE, Kahsai L, et al. (2010) PLoS ONE 5(12): e15780.

2. Why is it useful?

Phenotype and expression data are annotated with neuroanatomy terms from the DAO, facilitating searching.

Search FlyBase for a neuroanatomy term using the 'Vocabularies' tool

FB2014_05, released September 9th, 2014

FlyBase — A Database of *Drosophila* Genes & Genomes

Home   Tools   Files   Species   Documents   Resources   News   Help   Archives   Jump to Gene Go

BLAST   GBrowse   QueryBuilder   RNA-Seq Search   Vocabularies   ImageBrowse   Batch Download

Or data attached to any of its children terms

Neurons that are part of the dopaminergic PPL1 cluster

neuron
| dopaminergic neuron
→ dopaminergic PPL1 neuron   53 rec.   number of records
| dFB neuron of the dopaminergic PPL1 cluster   2 rec.
| DP neuron of the dopaminergic PPL1 cluster   5 rec.
| MB-alpha neuron of the dopaminergic PPL1 cluster   4 rec.
| MB-alpha' neuron of the dopaminergic PPL1 cluster
| MB-AMP neuron of the dopaminergic PPL1 cluster   1 rec.
| MB-MP1 neuron of the dopaminergic PPL1 cluster   6 rec.
| MB-MV1 neuron of the dopaminergic PPL1 cluster   2 rec.
| MB-SV neuron of the dopaminergic PPL1 cluster
| MB-V1 neuron of the dopaminergic PPL1 cluster   5 rec.

Find alleles that cause a phenotype or insertions that are expressed in a specific set of neurons

Phenotypic Data
Phenotypic Class
Phenotype Manifest In

Allele Scer\GAL4[alrm.PD]

gamma Kenyon cell, with Ced-12[KK102788]	(Tasdemir-Yilmaz and Freeman, 2014)
gamma Kenyon cell, with Crk[GD8583]	(Tasdemir-Yilmaz and Freeman, 2014)
gamma Kenyon cell, with drpr[dsRNA.Scer\UAS]	(Tasdemir-Yilmaz and Freeman, 2014)
gamma Kenyon cell, with EcR[B1-ΔC655.F645A.Scer\UAS]	(Tasdemir-Yilmaz and Freeman, 2014)
gamma Kenyon cell, with EcR[B1-ΔC655.W650A.Scer\UAS]	(Tasdemir-Yilmaz and Freeman, 2014)
gamma Kenyon cell, with mbc[GD6965]	(Tasdemir-Yilmaz and Freeman, 2014)
gamma Kenyon cell, with shi[1.Scer\UAS]	(Tasdemir-Yilmaz and Freeman, 2014)
gamma Kenyon cell	somatic clone, with EcR[B1-ΔC655.F645A.Scer\UAS]	(Tasdemir-Yilmaz and Freeman, 2014)

Dopaminergic PPL1 neuron

General Information

| Term | dopaminergic PPL1 neuron | ID (Ontology) | FBbt:00100219 (Fly Anatomy) |
| Definition | A dopaminergic neuron whose cell body is located in a cluster of approximately 12 cell bodies in the cortex of the posterior inferior lateral protocerebrum, immediately lateral to the mushroom body calyx. Members of this group project to various parts of the mushroom body: the tip of the alpha lobe; the tip of the alpha' lobe; the upper portion of the alpha lobe segment 2; alpha lobe segment 1 and the lower part of segment 2; and the peduncle and spur (Mao and Davis, 2009). Long-range fibers project bilaterally to and arborise in the tips and stalks of the alpha and alpha' lobes, the heel and the peduncle (Claridge-Chang et al., 2009). Other members of this group arborize in areas other than the mushroom body: the edge of the medial portions of the medial lobes; broad areas surrounding the ipsilateral vertical lobes; areas posterior to the ipsilateral vertical lobes; the entire span of the superior arch (Mao and Davis, 2009) and the central complex (Claridge-Chang et al., 2009).[FlyBase:FBrf0208427 FlyBase:FBrf0208958] | | |

Records annotated with this exact term

Data Class	Field	Records
Alleles (FBal)	PHENOTYPE_MANIFEST_IN	21
Genes (FBgn)	POLYPEPTIDE_EXPRESSION	1
Insertions (FBti)	EXPRESSION_STAGE_TISSUE_POSITION	9
Transposons (FBtp)	PHENOTYPE_MANIFEST_IN	18

Expression Data
Reporter Expression
distribution deduced from reporter (Gal4 UAS)

Insertion Dmel\P{GawB}IP3K2[NP2758]

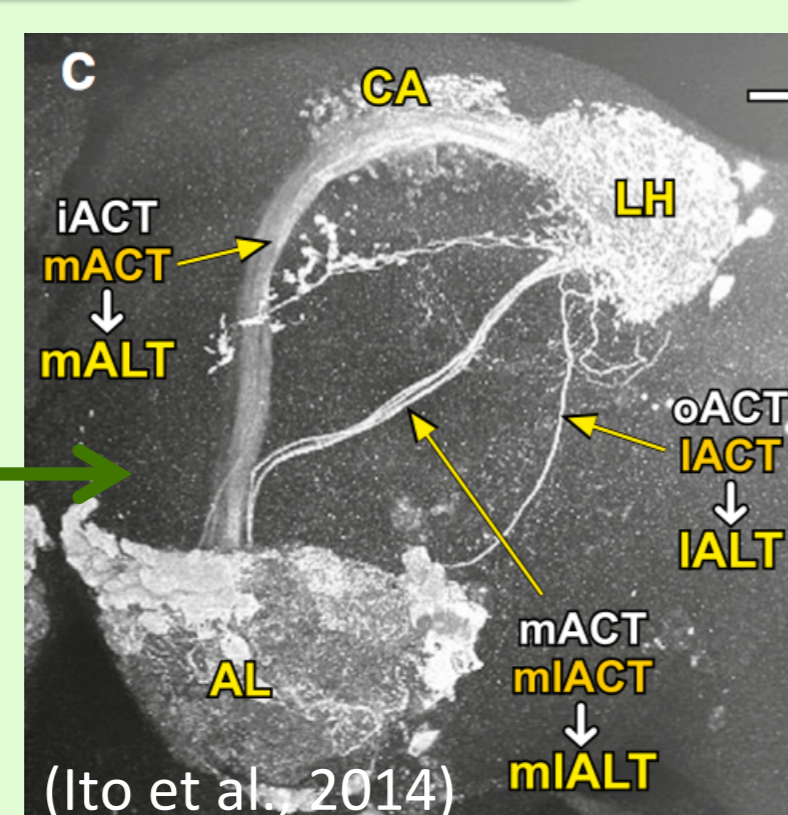| Stage	Tissue/Position (including subcellular localization)	Reference
adult stage	mushroom body pedunculus-medial lobe arborizing neuron 1	(Tanaka et al., 2008)
	mushroom body gamma lobe slice 1	(Tanaka et al., 2008)
	pedunculus of adult mushroom body	(Tanaka et al., 2008)
	dopaminergic PPL1 neuron	subset	(Aso et al., 2012)
	mushroom body pedunculus-medial lobe arborizing neuron 1	subset	(Aso et al., 2012)

3. Recent additions to adult brain terms and connecting data
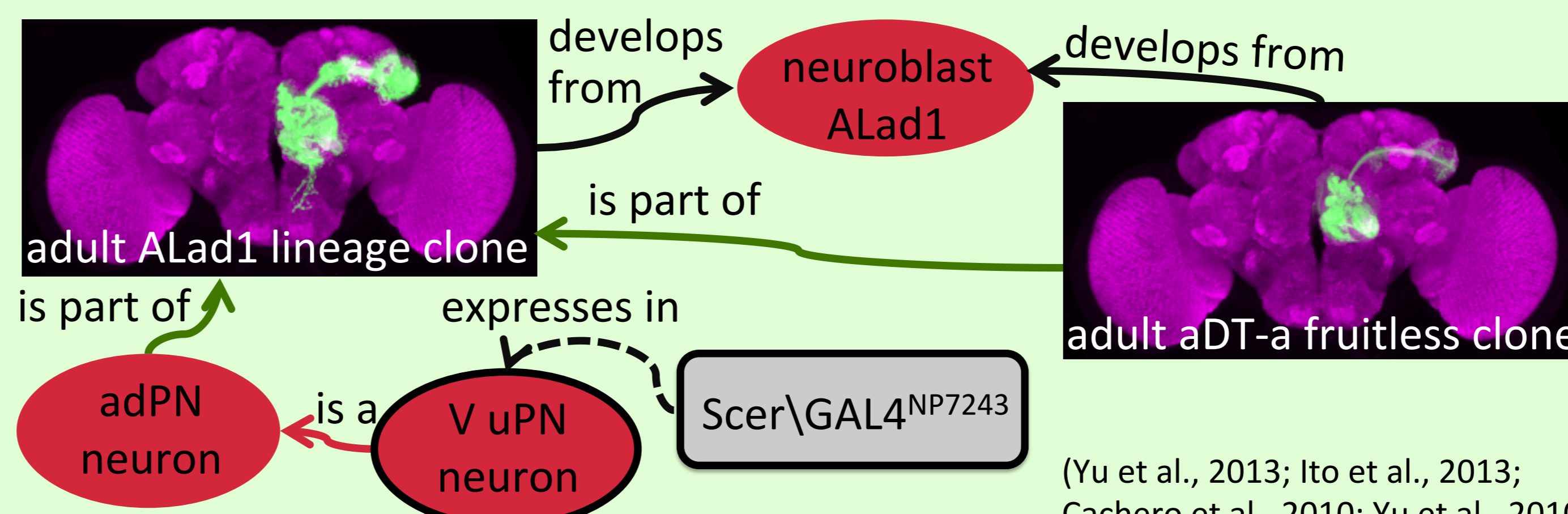
Adopted adult brain nomenclature as defined by BrainName

44 neuropils
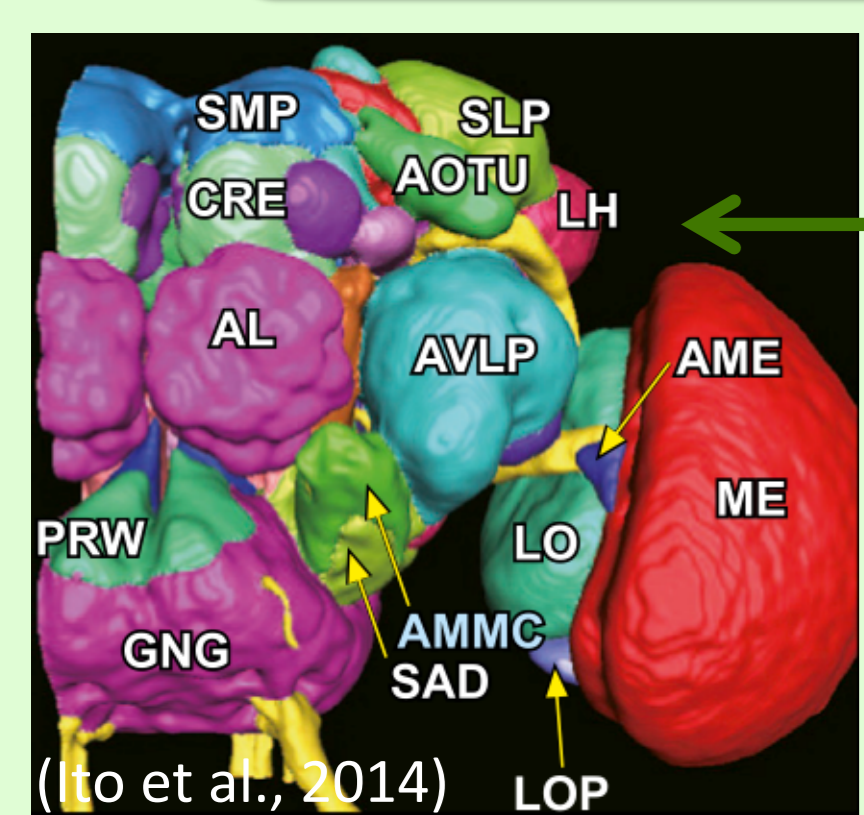
(Ito et al., 2014)

55 tracts

(Ito et al., 2014)

Terms added for recently identified lineage clones and *fruitless* clones

develops from → neuroblast ALad1 ← develops from

adult ALad1 lineage clone

is part of

adult aDT-a fruitless clone

is part of, expresses in

adPN neuron ← is a → V uPN neuron ⟶ Scer\GAL4[NP7243]

(Yu et al., 2013; Ito et al., 2013; Cachero et al., 2010; Yu et al., 2010)

To come

New nomenclature for adult ventral nerve cord