

Supplemental Table 1. Neuropeptides regulating behaviors in *Drosophila*

Behavior	Neuropeptide	Circuit	References
Olfaction	sNPF	OSN-PN Antennal lobe	(Root et al., 2011)
	MIP	OSN-PN Antennal lobe	(Hussain et al., 2016)
	TK	LN-OSN-PN Antennal lobe	(Ignell et al., 2009; Ko et al., 2015)
	CCHa1	OSNs Antennal lobe	(Farhan et al., 2013)
	DILPs	OSN-PN Antennal lobe	(Root et al., 2011)
	NPF	Brain interneurons	(Beshel and Zhong, 2013) (Lee et al., 2017)
	SIFa	Interneurons	(Martelli et al., 2017)
Taste	sNPF	LNCs-Gr66a ¹	(Inagaki et al., 2014; Kim et al., 2013)
	Hugin	Hugin neurons (SEZ)	(Melcher and Pankratz, 2005; Schlegel et al., 2016)
	TK	Pheromone pahway	(Shankar et al., 2015)
	LK	LK neurons	(Lopez-Arias et al., 2011)
	AKH	Gr5a	(Bharucha et al., 2008; Jourjine et al., 2016; Yu et al., 2016)
Food search/ Feeding	NPF	Interneurons	(Chung et al., 2017; Pu et al., 2018; Shen and Cai, 2001; Tsao et al., 2018; Wang et al., 2013; Wu et al., 2005a; Wu et al., 2005b)
	sNPF	OSNs-PNs, Interneurons MB circuits	(Hong et al., 2012; Lee et al., 2004; Root et al., 2011; Shen and Cai, 2001; Tsao et al., 2018)
	TK	OSNs-PNs	(Ko et al., 2015)
	Hugin	SEZ neurons	(Melcher and Pankratz, 2005)
	Sex peptide	Via sperm In females	(Barnes et al., 2008; Carvalho et al., 2006; Chapman et al., 2003; Kubli, 2003)
	DSK	IPCs and brain interneurons	(Söderberg et al., 2012)
	AKH	CC cells	(Bharucha et al., 2008; Galikova et al., 2015; Lee and Park, 2004)
	SIFa	Interneurons	(Martelli et al., 2017)
	AstA	Brain neurons or EECs	(Chen et al., 2016; Hentze et al., 2015; Hergarden et al., 2012; Tsao et al., 2018; Wang et al., 2012)
	CCHa2	Gut, fat body	(Ren et al., 2015; Sano et al., 2015)
	DH44	MNCs and TAG	(Dus et al., 2015; Yang et al., 2018; Zandawala et al., 2018a)
	LK	Brain neurons	(Al-Anzi et al., 2010; Zandawala et al., 2018b)
	MIP	Brain neurons	(Min et al., 2016)
	ITP	LNCs	(Galikova et al., 2018)
	CRZ	LNCs	(Kubrak et al., 2016)
Locomotion (Independent of clock)	DSK	larvae	(Chen et al., 2012)
	Proctolin	larvae	(Ormerod et al., 2016)
	PDF	Outside clock	(Pirez et al., 2013)
	AKH	CC larvae	(Ibrahim et al., 2018)
	Ast-A	larvae	(Wang et al., 2012)
	LK	larvae	(Okusawa et al., 2014)

Explorative walking	sNPF	Central body	(Kahsai et al., 2010)
	TK	Central body	(Kahsai et al., 2010)
Clock/Sleep	PDF	clock circuit	(Liang et al., 2017; Renn et al., 1999)
	sNPF	clock and other circuit	(Chen et al., 2013; Liang et al., 2017; Shang et al., 2013)
	NPF	clock circuit	(Chung et al., 2017; Hamasaka et al., 2010; Hermann et al., 2012)
	ITP	clock circuit	(Hermann-Luibl et al., 2014)
	DH31	clock circuit	(Goda et al., 2016)
	CCHa1	clock circuit	(Fujiwara et al., 2018)
	Sex peptide	In females	(Isaac et al., 2010)
	LK	Lateral horn neurons (LHLK)	(Cavey et al., 2016; Murakami et al., 2016; Murphy et al., 2016; Yurgel et al., 2018)
	DH44	MNCs	(Cavanaugh et al., 2014; King et al., 2017)
	SIFa	Brain neurons	(Cavanaugh et al., 2014; Cavey et al., 2016; Park et al., 2014)
	Hugin-PK	SEZ neurons	(King et al., 2017)
	MIP	Brain neurons	(Oh et al., 2014)
	FMRFa	CNS neurons	(Lenz et al., 2015)
	DILPs	IPCs	(Cong et al., 2015)
	Bursicon	CNS neurons	(Cavey et al., 2016)
	Ast-A	CNS neurons	(Chen et al., 2016; Donlea et al., 2018)
Aggression²	NPF	Interneurons	(Dierick and Greenspan, 2007)
	Sex peptide	In females	(Bath et al., 2017)
	DSK	IPCs + others	(Luo et al., 2014; Williams et al., 2014)
	TK	Interneurons	(Asahina et al., 2014)
	DH44	DH44-R1 cells ³	(Kim et al., 2018)
	Natalisin	Interneurons	(Jiang et al., 2013)
Learning	sNPF	Mushroom Body	(Knapek et al., 2013)
	Corazonin	Brain neurons ⁴	(Zer-Krispil et al., 2018)
	NPF	Interneurons	(Krashes et al., 2009; Rohwedder et al., 2015; Shao et al., 2017)
Nociception	sNPF (ILP7)	Interneurons ⁵	(Hu et al., 2017)
	TK	Interneurons ⁵	(Im et al., 2015)
	Ast-C	Ast-C receptor	(Bachtel et al., 2018)
	Leucokinin	LK receptor	(Ohashi and Sakai, 2018)
Ethanol-related behaviors	Corazonin	LNCs	(McClure and Heberlein, 2013; Sha et al., 2014)
	DILPs	IPCs	(Corl et al., 2005)
	NPF	Interneurons	(Shohat-Ophir et al., 2012)
Mating and copulation	NPF	Interneurons	(Gendron et al., 2014; Kim et al., 2013; Shohat-Ophir et al., 2012)
	Corazonin	TAG	(Tayler et al., 2012; Zer-Krispil et al., 2018)
	DH44	MNCs	(Lee et al., 2015)
	PDF	clock circuit	(Kim et al., 2013; Krupp et al., 2013)
	Sex peptide	Sperm transfer	(Chen et al., 1988; Kubli, 2003; Wolfner, 2002; Yang et al., 2009)
	SIFa	Interneurons	(Sellami and Veenstra, 2015; Terhzaz et al., 2007)
	Natalisin	Interneurons	(Jiang et al., 2013)
Sperm storage	MIP	Interneurons	(Jang et al., 2017)
		TAG (females)	
Egg laying	DH44	In females	(Lee et al., 2015)
	DILP7	TAG efferents	(Yang et al., 2008)

This table is altered from (Nässel and Zandawala, 2019)

*Notes to Table:*¹ The LNCs regulate Gr66 bitter taste with sNPF² Males if not indicated³ Specific cells in circuit not known⁴ A successful copulation is a reward in male flies and strengthens long-term appetitive memories⁵ Interneurons in TAG of larvae*Peptide acronyms:* in list below

Other acronyms: Gr5a and Gr66a, gustatory receptors; IPCs, insulin-producing cells; LN, local neurons; LNCs, lateral neurosecretory cells; MB, mushroom bodies; MNCs, median neurosecretory cells; OSN, olfactory sensory neurons; PN, projection neurons; SEZ, subesophageal zone; TAG, thoracico-abdominal ganglion

Peptide acronyms (used in figures and Table above)

AKH	Adipokinetic hormone
Ast-A	Allatostatin-A
Ast-C	Allatostatin-C
Burs	Bursicon
Capa	Capability (CAPA-1 and 2, Capa-pyrokinin)
CCAP	Crustacean cardiactive peptide
CCHa	CCHamide-1 and 2 (CCHa-1 and 2)
CNMa	CNMamide
CRZ	Corazonin
DH31	Diuretic hormone 31
DH44	Diuretic hormone 44
DILP	<i>Drosophila</i> insulin-like peptide (DILP1-8)
DMS	Dromyosuppressin
DSK	Drosulfakinins
EH	Eclosion hormone
FMRFa	FMRFamides
Hugin	<i>Hugin</i> -pyrokinin (hug-PK)
ITP	Ion transport peptide
LK	Leucokinin
MIP	Myoinhibitory peptide (Allatostatin-B)
NPF	Neuropeptide F
NPLP1	Neuropeptide-like precursor peptide 1
NTL	Natalisin
sNPF	Short NPF
OK	Orcokinin (OK-A and B)
PDF	Pigment-dispersing factor
Proctolin	Proctolin
PTTH	Prothoracicotropic hormone
SP	Sex peptide
SIFa	SIFamide
TK	Tachykinin

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