**Figure 2 - source data 1. *Drosophila* RPNs in pars intercerebralis (PI).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RPNs** | **Synonyms** | **Neuropeptides expressed** | **Neuropeptide/neurotransmitter receptors expressed** | **RPN Functions** |
| IPCs | * mNSCs
* dILPs
* CC-PI
 | * Ilp1, 2, 3, 5 (Insulin-like peptide 1, 2, 3, 5) (Brogiolo et al., 2001)
* Dsk (Drosulfakinin) (Söderberg et al., 2012)
 | * Oamb (Octopamine receptor in mushroom bodies) (Crocker et al. 2010)
* GABA-B-R2 (metabotropic GABA-B receptor subtype 2) (Enell et al., 2010)
* TkR99D (Tachykinin-like receptor at 99D) (Birse et al., 2011)
* slo (slowpoke), Slob (Slowpoke binding protein) (Sheldon et al., 2011)
* CrzR (Corazonin receptor) (Kapan et al., 2012)
* 5-HT1A (serotonin receptor 1A) (Luo et al., 2012)
* AstA-R2 (Allatostatin A receptor 2) (Hentze et al., 2015)
* CCHa2-R (CCHamide-2 receptor) (Sano et al., 2015)
* PK2-R1 (Pyrokinin 2 receptor 1) (Schlegel et al., 2016)
* Lkr (Leucokinin receptor) (Zandawala et al., 2018)
* AstA-R1, -R2 (Allatostatin A receptor 1, 2), AstC-R2 (Allatostatin C receptor 2), Octβ1R (Octopamine β1 receptor) (Cocanougher et al., 2019)
* sNPF-R (short neuropeptide F receptor) (Oh et al., 2019)
 | * Diapause (Tatar and Yin, 2001)
* Fecundity and lifespan (Broughton et al., 2005)
* Sugar metabolism (Broughton et al., 2005 and 2008)
* Stress resistance (Broughton et al., 2005; Karpac et al., 2009; Grönke et al., 2010; Zandawala et al., 2018)
* Food intake regulation (Wu et al., 2005; Söderberg et al., 2012)
* Locomotion (Belgacem and Martin, 2006; Jones et al., 2009)
* Sleep (Crocker et al., 2010)
* Development and growth delay (Grönke et al. 2010)
* Sensitivity to food odors (Root et al., 2011)
* Starvation resistance (Kapan et al., 2012)
* Clock circuit (Cong et al., 2015)
* Food preference (Semaniuk et al., 2018)
 |
| DMS | * mNSCs
 | * Ms (Myosuppressin) (McCormick and Nichols, 1993)
 | * PK2-R1 (Pyrokinin 2 receptor 1) (Schlegel et al., 2016)
 | * Myoinhibitory on visceral, crop and gut muscles (Johnson et al., 2000; Merte and Nichols, 2002; Dickerson et al., 2012)
* Locomotion velocity (Kiss et al., 2013)
* Triger for eclosion (Ruf et al., 2017)
* CO2 detection circuit **(this study)**
 |
| DH44 | * mNSCs
 | * Dh44 (Diuretic hormone 44) (Cabrero et al., 2002)
* Nplp2, 3 (Neuropeptide-like precursor 2, 3) (Cavanaugh et al., 2014)
* Ilp2 (Insulin-like peptide 2) (Ohhara et al., 2018)
 | * PK2-R1 (Pyrokinin 2 receptor 1) (Schlegel et al., 2016)
* Lkr (Leucokinin receptor) (Cannell et al., 2016)
 | * Diuretic function (Cabrero et al., 2002; Hector et al., 2009; Dus et al., 2015)
* Food search and feeding (Söderberg et al., 2012)
* Rest:activity rhythms (Cavanaugh et al., 2014)
* Postingestive glucose sensor (Dus et al., 2015)
* Sperm ejection and storage (Lee et al., 2015)
* Stress regulation (Cannell et al., 2016)
* Postingestive amino acid sensor (Yang et al., 2018)
* CO2 detection circuit **(this study)**
 |

**Figure 2 - source data 1. *Drosophila* RPNs in pars lateralis (PL).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RPNs** | **Synonyms** | **Neuropeptides****expressed** | **Neuropeptide/neurotransmitter receptors****expressed** | **RPN Functions** |
| CRZ | * DLP
* DN1
* CC-PL-1
* CN neurons
 | * Crz (Corazonin) (Choi et al., 2005)
* Proc (Proctolin) (Isaac et al., 2004)
* sNPF (short neuropeptide F) (Nässel et al., 2008; Kapan et al., 2012)
* Dsk (Drosulfakinin) (Söderberg et al., 2012)
 | * Dh44-R1 (Diuretic hormone 44 receptor 1), Dh31-R (Diuretic hormone 31 receptor) (Johnson et al., 2005)
* AstA-R2 (Allatostatin A receptor 2) (Johnson et al., 2005; Veenstra, 2009)
* Oamb (Octopamine receptor in mushroom bodies) (Imura et al., 2020)
 | * Initiation of ecdysis (Kim et al., 2004)
* Stress regulation (Veenstra, 2009; Kapan et al., 2012; Kubrak et al., 2016; Zhao et al., 2010)
* Fructose sensor (Miyamoto et al., 2012)
* Feeding regulation (Miyamoto et al., 2012; Hergarden et al., 2012)
* Ethanol tolerance (Sha et al., 2014)
* Egg laying (Gospocic et al., 2017)
* Growth regulation (via PTTH) (Imura et al., 2020)
* Glucose sensing/homeostasis (Oh et al., 2019)
* CO2 detection circuit **(this study)**
 |
| ITP | * ipc-1
* ALK
* CC-PL-2
 | * ITP (Ion transport peptide) (Dircksen et al., 2008)
* Lk (Leucokinin) (de Haro et al., 2010)
* sNPF (short neuropeptide F), Tk (Tachykinin) (Kahsai et al., 2010)
 | * Unknown
 | * Anti-diuretic, water and ion homeostasis (Kahsai et al., 2010; Gáliková et al., 2018)
* Food search and feeding (Gáliková et al., 2018)
 |
| PTTH | * PG-LP
 | * Ptth (Prothoracicotropic hormone) (McBrayer et al., 2007)
 | * CrzR (Corazonin receptor) (Imura et al., 2020)
 | * Regulation of ecdysone production (McBrayer et al., 2007)
* Promotes light avoidance at end of larval stage (Yamanaka et al., 2013)
* Circadian rhythmicity of eclosion (Selcho et al., 2017)
* Metamorphosis onset, reproductive capacity (Shimell et al., 2018)
* Growth (Colombani et al., 2012)
 |
| CA-LP |  | * FMRFa (FMRFamide) (Hartenstein, 2006)
* Burs (Bursicon) **(this study)**
 | * Unknown
 | * Unknown
 |

**Figure 2 - source data 1. *Drosophila* RPNs in subesophageal zone (SEZ) or protocerebrum.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RPNs** | **Synonyms** | **Neuropeptides****expressed** | **Neuropeptide/neurotransmitter receptors****expressed** | **RPN Functions** |
| HugRG | * CC-MS1
 | * Hug (Hugin) (Melcher and Pankratz, 2005; Schlegel et al., 2016)
 | * Unknown
 | * Unknown function for this subpopulation of Hugin cells
 |
| CAPA | * CC-MS2
 | * Capa (Capability) (Kean et al., 2002; Wegener et al., 2006)
 | * Unknown
 | * Unknown
 |
| EH | * VM neurons
 | * Eh (Eclosion hormone) (Hodoroyski et al., 1993)
 | * ETHR (Kim et al., 2006)
 | * Onset of ecdysis behavior (Truman, 1992; Baker et al., 1999)
* Coordination of eclosion (McNabb et al., 1997)
* Tracheal filling (Baker et al., 1999)
* Pre-ecdysis behavior (Krüger et al., 2015)
 |

Much of the information presented in Figure 2 - source data 1 is comprehensively shown and summarized in Siegmund and Korge (2001), Nässel et al. (2008), Nässel and Winther (2010), Nässel et al. (2013) and Nässel and Zandawala (2019).

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