**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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