**Supplementary Table / Supplementary File 2**

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| --- | --- | --- | --- | --- | --- |
| **Mammalian Rabs** | **Rab tissue localization in**  **human** | **Rab tissue localization in rodent** | ***D. melanogaster* Rabs** | **Rab tissue localization in *D. melanogaster*** | **References** |
| Rab1a | **RNA:** low tissue specificity - ubiquitous  **protein:** general cytoplasmic expression | **RNA:** no regional signal (Mm, E) | DmRab1  (omelette) | **RNA:** ubiquitous (E, A)  **protein:** ubiquitous (L), brain (A), heart (A) | **H**: The human protein atlas  **R:** Transcriptome Atlas mouse embryo  **Dm:** (Chan et al., 2011; Zhang et al., 2007) (Cammarato et al., 2011), flyatlas2 |
| Rab1b | **RNA:** Low tissue specificity – ubiquitous  **protein:** general cytoplasmic expression | **RNA:** no regional signal (Mm, E) | **H:** The human protein atlas  **R:** Transcriptome Atlas mouse embryo |
| Rab2a | **RNA:** Low tissue specificity – ubiquitous  **protein:** general cytoplasmic expression | **RNA:** no regional signal (Mm, E) | DmRab2 | **RNA:** central nervous system (E), ubiquitous (A)  **protein**: ubiquitous (L), brain (A), heart (A) | **H:** The human protein atlas  **R:** Transcriptome Atlas mouse embryo  **Dm:** (Cammarato et al., 2011; Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab2b | **RNA:** Low tissue specificity – ubiquitous | **RNA:** weak regional signal in the nervous system (Mm, E) | **H:** The human protein atlas  **R:** Transcriptome Atlas mouse embryo |
| Rab3a | **RNA:** tissue enriched (brain) -widespread in low levels  **protein:** selective expression in CNS, islets of Langerhans and adrenal medulla | **RNA:** brain (Mm, A and Rn, A) | DmRab3 | **RNA:** central nervous system (E), nervous system high (A)  **protein:** nervous system high (L), brain (A) | **H:** The human protein atlas  **R:** (Elferink et al., 1992; Sollner et al., 2017)  **Dm:** (Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab3b | **RNA:** tissue enhanced (brain, placenta, prostate) - widespread  **protein:** cytoplasmic expression in pancreatic islet cells, glandular cells in prostate and enteroendocrine cells of the gastrointestinal tract | **RNA:** No regional signal (Mm, E) | **H:** The human protein atlas  **R:** Transcriptome Atlas mouse embryo |
| Rab3c | **RNA:** group enriched (adrenal gland, brain, pituitary gland) - widespread  **protein:** cytoplasmic expression in CNS, adrenal medulla and islets of Langerhans. | **RNA:** strong regional signal in nervous system and weak in nose (Mm, E) | **H:** The human protein atlas  **R:** Transcriptome Atlas mouse embryo |
| Rab3d  (Rab16) | **RNA:** Low tissue specificity – ubiquitous  **protein:** cytoplasmic expression in most tissues. | **RNA:** moderate regional signal in nervous system and skin (Mm, E) | **H:** The human protein atlas  **R:** Transcriptome Atlas mouse embryo |
| Rab4a | **RNA:** Low tissue specificity – ubiquitous | **RNA:** moderate regional signal in the nervous system (Mm, E) | DmRab4 | **RNA:** ubiquitous (E, A), enriched in mesoderm and ectoderm (E)  **protein:** nervous system high (L), brain (A), heart (A) | **H:** The human protein atlas  **R:** Transcriptome Atlas mouse embryo  **Dm:** (Cammarato et al., 2011; Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab4b | **RNA:** Low tissue specificity – ubiquitous | **RNA:** strong regional signal (nose, alimentary system, skeleton) (Mm, E) | **H:** The human protein atlas  **R:** Transcriptome Atlas mouse embryo |
| Rab5a | **RNA:** Low tissue specificity – ubiquitous  **protein:** cytoplasmic expression in all tissues | no data | DmRab5 | **RNA:** ubiquitous (E, A), enriched in garland cells (E)  **protein:** ubiquitous (L), brain (A) | **H:** The human protein atlas  **Dm:** (Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab5b | **RNA:** Low tissue specificity – ubiquitous  **protein:** ubiquitous cytoplasmic expression | no data | **H:** The human protein atlas |
| Rab5c | **RNA:** Low tissue specificity – ubiquitous  **protein**: cytoplasmic expression in several tissues | **RNA:** not detected (Mm, E) | **H:** The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab6a | **RNA:** Low tissue specificity – ubiquitous  **protein**: ubiquitous | **RNA**: strong regional signal in the nervous and alimentary system, eye and nose (Mm, E)  **protein**: ubiquitously expressed (Mm, E) | DmRab6  (warthog) | **RNA:** ubiquitous (E, A)  **protein:** ubiquitous (L), brain (A) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo, (Bardin et al., 2015)  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab6b | **RNA:** Group enriched (brain, parathyroid gland) – widespread  **protein**: predominantly expressed in the brain | **RNA:** strong regional signal in the nervous system, eye and nose (Mm, E) | **H**: The human protein atlas, (Opdam et al., 2000)  **R**: Transcriptome Atlas mouse embryo |
| Rab6a’ | **protein**: ubiquitous expression | **protein**: ubiquitously expressed (Mm, E) | **H**: (Echard et al., 2000)  **R**: (Bardin et al., 2015) |
| Rab6c\* | **RNA**: tissue enhanced (parathyroid gland) – widespread;  fetal and adult brain, prostate, testis, and spinal cord | not in mouse | **H**: The human protein atlas, (Young et al., 2010) |
| Rab6d (Rab41) | See Rab41 | not in mouse |  |
| Rab7a | **RNA**: Low tissue specificity – ubiquitous  **protein**: Ubiquitous cytoplasmic expression, high expression in skeletal muscle | **RNA**: ubiquitous expression, with high levels in liver, heart and kidney (Mm, E) | DmRab7 | **RNA:** ubiquitous (E, A)  **protein:** ubiquitous (L), brain (A), heart (A) | **H**: The human protein atlas, (Verhoeven et al., 2003)  **R**: Transcriptome Atlas mouse embryo, (Verhoeven et al., 2003)  **Dm**: (Cammarato et al., 2011; Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab7b | **RNA:** Tissue enhanced (adipose tissue, skin) – widespread | no data | **H**: The human protein atlas |
| Rab8a | **RNA**: Low tissue specificity – ubiquitous | no data | DmRab8 | **RNA:** ubiquitous (E+A), enriched in mesoderm and ectoderm (E)  **protein:** ubiquitous (L), brain (A) | **H**: The human protein atlas  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab8b | **RNA**: Low tissue specificity – ubiquitous | **RNA**: no regional signal (Mm, E) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab8c (Rab13) | See Rab13 | See Rab13 |
| Rab9a | **RNA**: Low tissue specificity – ubiquitous  **protein**: Ubiquitous cytoplasmic expression, most abundant in glandular and lymphoid cells | **RNA**: no regional signal (Mm, E) | DmRab9 | **RNA:** ubiquitous (E+A), enriched in CNS (E)  **protein:** nervous system high (L), brain (A) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab9b | **RNA**: Tissue enhanced (heart muscle) – widespread  **protein**: Membranous and cytoplasmic expression in most tissues, highest expression in intercalated discs of heart myocytes | **RNA**: no regional signal (Mm, E) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab10 | **RNA**: Low tissue specificity – ubiquitous  **protein**: Ubiquitous cytoplasmic expression | RNA: no regional signal (Mm, E) | DmRab10 | **RNA:** ubiquitous (E+A), enriched in CNS (E)  **protein:** widespread (L), brain (A), heart (A) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo  **Dm**: (Cammarato et al., 2011; Chan et al., 2011; Zhang et al., 2007), flyatlas2, |
| Rab11a | **RNA**: Low tissue specificity -ubiquitous  **protein**: Ubiquitous cytoplasmic and membranous expression | **RNA**: no regional signal (Mm, E) | DmRab11 | **RNA:** ubiquitous (E+A), enriched in gut (E)  **protein:** ubiquitous (L), brain (A), heart (A) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo  **Dm**:(Cammarato et al., 2011; Chan et al., 2011; Zhang et al., 2007) flyatlas2 |
| Rab11b | **RNA**: Low tissue specificity – ubiquitous | **RNA**: no regional signal (Mm, E) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab11c (Rab25) | See Rab25 | See Rab25 |  |
| Rab12 | **RNA**: Tissue enhanced (skeletal muscle) – ubiquitous  **protein**: Ubiquitous cytoplasmic expression | **RNA**: no regional signal (Mm, E) | - | - | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab13 (Rab8c) | **RNA**: Low tissue specificity – ubiquitous  **protein**: Cytoplasmic expression in most tissues | **RNA**: moderate regional signal brain and spinal cord (Mm, E) | DmRab8 | see DmRab8 | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab14 | **RNA**: Low tissue specificity – ubiquitous  **protein**: General cytoplasmic expression, ubiquitous | **RNA**: no regional signal (Mm, E)  **protein**: ubiquitous expression with highest levels in brain, kidney, spleen and thymus (Rn) | DmRab14 | **RNA:** ubiquitous (E+A), enriched in salivary gland and CNS (E)  **protein:** widespread(L), brain (A) | **H**: The human protein atlas, (Junutula et al., 2004)  **R**: Transcriptome Atlas mouse embryo, (Junutula et al., 2004)  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab15 | **RNA**: tissue enhanced (brain) – widespread  **protein**: Cytoplasmic expression in all tissues (uncertain) | **RNA**:  Specifically expressed in brain (Rn) | - | - | **H**: The human protein atlas  **R:** (Elferink et al., 1992) |
| Rab16 (Rab3d) | See Rab3d | See Rab3d | See DmRab3 |  |  |
| Rab17 | **RNA**: Tissue enhanced (intestine, liver) – widespread  **protein**: Cytoplasmic and membranous expression in several different tissue types, including CNS and most glandular cells | **RNA**: moderate regional signal in nose, alimentary system and salivary gland (Mm, E), specific to epithelial cells, in tissue like kidney, liver and intestine (Mm, A)  **protein**: kidney (basolateral plasma membrane and to apical tubules) (Mm, A) | - | - | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo,(Lutcke et al., 1993) |
| Rab18 | **RNA**: low tissue specificity - ubiquitous  **protein**: Ubiquitous cytoplasmic expression (uncertain) | **RNA**: no regional signal (Mm, E), detected in kidney, liver, intestine, brain, lung, spleen, heart (Mm, A)  **protein**: kidney cortex, tubular structures (Mm) | DmRab18 | **RNA:** ubiquitous (E+A)  **protein:** widespread (L), brain(A), heart (A) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo, (Lutcke et al., 1994)  **Dm**: (Cammarato et al., 2011; Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab19a | **RNA**: Tissue enhanced (pancreas)- widespread | **RNA**: not detected in embryo, tissue specifically (Mm, E), intestine lung and spleen, kidney (Mm, A) | DmRab19 | **RNA:** ubiquitous(E+A)  **protein:** nervous system high (L), brain (A) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo, (Lutcke et al., 1995)  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2, this study |
| Rab19b (Rab43) | See Rab43 | See Rab43 |  |
| Rab20 | **RNA**: Low tissue specificity – ubiquitous  **protein**: Cytoplasmic expression in several tissues (uncertain) | **RNA**: not detected in embryo (Mm, E), in a variety of adult mouse tissue: kidney, liver, lung, spleen, heart but not detected in the brain (Mm, A)  **protein**: kidney (Mm) |  | - | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo,(Lutcke et al., 1994) |
| Rab21 | **RNA**: Low tissue specificity – ubiquitous  **protein**: General cytoplasmic expression | **RNA**: moderate regional signal in nervous, alimentary and haemolymphoid system and eye (Mm, E) | DmRab21 | **RNA:** ubiquitous (E+A), enriched in gut (E)  **protein:** nervous system high (L), brain (A) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2, this study |
| Rab22a | **RNA**: Low tissue specificity – ubiquitous  **protein**: Cytoplasmic expression in most tissues | **RNA**: no regional signal (Mm, E) | - | - | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab22b  (Rab31) | **RNA**: Low tissue specificity – ubiquitous  **protein**: Cytoplasmic expression in most tissues | **RNA**: moderate regional signal in the nervous and alimentary system, salivary gland, skeletal muscles, and skin (Mm, E)  **protein**: enriched in the brain (Mm, A and Rn, A) spleen, and intestine, in much lower levels in other organs (Rn) | - | - | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo, (Chua et al., 2014; Ng et al., 2007) |
| Rab23 | **RNA**: Tissue enhanced (smooth muscle, urinary bladder) – widespread  **protein**: General cytoplasmic and membranous expression | **RNA**: Predominantly brain-enriched (Mm, A)  **protein**: predominantly brain-enriched, low levels in multiple tissues (Mm, A) | DmRab23 | **RNA:** stripes (E)  **protein:** nervous system high (L), brain (A) | **H**: The human protein atlas  **R**: (Guo et al., 2006; Olkkonen et al., 1994)  **Dm**: (Chan et al., 2011; Zhang et al., 2007), this study |
| Rab24 | **RNA**: Low tissue specificity – ubiquitous | **RNA**: regional signal in peripheral nervous system and skin (Mm, E) | - | - | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab25  (Rab11c) | **RNA**: Tissue enhanced (esophagus) – widespread  **protein**: Membranous expression in most epithelial cells | **RNA**: moderate regional signal in nose, alimentary system, salivary gland, intestines, renal/urinary system and skin (Mm, E), specifically expressed in epithelial cells (Oc) | See DmRab11 |  | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo, (Goldenring et al., 1993) |
| Rab26a | **RNA**: Tissue enhanced (brain, liver, pancreas, salivary gland) – widespread | **protein**: parotid gland (Rn, A) | DmRab26 | **RNA:** CNS (E), nervous system high (A)  **protein:** nervous system high (L), brain (A) | **H**: The human protein atlas,(Jin and Mills, 2014)  **R**: (Yoshie et al., 2000)  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2, this study |
| Rab26b  (Rab37) | See Rab37 | See Rab37 |  |
| Rab27a | **RNA**: Low tissue specificity – ubiquitous  **protein**: Cytoplasmic expression in most tissues, including immune cells | **RNA**: strong regional signal in brain, peripheral nervous, haemolymphoid and alimentary system and adrenal gland (Mm, E)  **protein**: broad expression with high levels in large intestine, spleen, eye, lung, stomach, and platelets (Mm) | DmRab27 | **RNA:** ubiquitous (E), nervous system high and ovary (A)  **protein:** nervous system high (L), brain (A) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo, (Barral et al., 2002)  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2, this study |
| Rab27b | **RNA**: Tissue enhanced (brain, stomach) – widespread  **protein**: Cytoplasmic and membranous expression mainly in glandular cells of gastrointestinal tract, breast, salivary gland, prostate, cells in renal tubules and urothelial cells | **RNA**: strong regional signal in the ear, eye, nose, intestines, nervous, alimentary respiratory renal/urinary, reproductive system and limb (Mm, E)  **protein**: platelets, gastrointestinal tract (Mm), pancreas (Rn and Mm, A), bladder, spleen, and brain (Mm, A) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo, (Barral et al., 2002; Chen et al., 2004; Chen et al., 2003b; Zhao et al., 2002) |
| Rab28 | **RNA**: Low tissue specificity – ubiquitous  **protein**: Cytoplasmic expression in most tissues | **RNA**: strong regional signal in nose, skeleton, limb (Mm, E) | - | - | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab29 | **RNA**: Low tissue specificity, ubiquitous  **protein**: Cytoplasmic expression in most tissues | no data | - | - | **H**: The human protein atlas |
| Rab30 | **RNA**: Low tissue specificity – ubiquitous  **protein**: Cytoplasmic expression in most tissues | no data | DmRab30 | **RNA:** ubiquitous (E+A), enriched in CNS (E)  **protein:** ubiquitous (L), brain (A) | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo  **Dm**: (Jin et al., 2012; Zhang et al., 2007), flyatlas2, this study |
| Rab31 (Rab22b) | see Rab22b | See Rab22b | - | - |  |
| Rab32a | **RNA:** Tissue enhanced (bone marrow) – ubiquitous  **protein:** Cytoplasmic expression in most tissues | **RNA**:  Broad expression with high levels in the liver (Mm, E) | DmRab32  (lightoid) | **RNA:** malpighian tubules(E), ubiquitous and eye enriched (A)  **protein:** nervous system high (L), brain (A) | **H**: The human protein atlas  **R**: (Cohen-Solal et al., 2003)  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2, this study |
| Rab32b (Rab38) | See Rab38 | See Rab38 |  |
| Rab33a | **RNA:** Tissue enhanced (blood, brain) – widespread | **RNA**:  Expression restricted to brain, weak in ovary and thymus (Mm) | - | - | **H**: The human protein atlas  **R**: (Zheng et al., 1997) |
| Rab33b | **RNA**: Low tissue specificity – ubiquitous | **RNA**:  ubiquitous expression (Mm) | - | - | **H**: The human protein atlas  **R**: (Zheng et al., 1998) |
| Rab34 | **RNA**: Low tissue specificity – ubiquitous  **protein**: General cytoplasmic expression | RNA: no regional signal (Mm, E) | - | - | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab35 | **RNA**: Low tissue specificity – ubiquitous  **protein**: Cytoplasmic expression in most | no data | DmRab35 | **RNA:** ubiquitous (E+A), enriched in CNS (E)  **protein:** ubiquitous (L), brain (A) | **H**: The human protein atlas  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab36 | **RNA**: Tissue enhanced (fallopian tube) – widespread | **RNA**: not detected (Mm, E) | - |  | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab37 | **RNA**: Tissue enhanced (blood, brain), widespread | **RNA**: not detected (Mm, E), bone marrow mast cells (Mm, CC) | DmRab26 | See DmRab26 | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo, (Masuda et al., 2000) |
| Rab38 | **RNA**: Tissue enhanced (retina, tongue)- widespread | **RNA**: strong regional signal in ear, nose, alimentary and respiratory system, salivary gland, stomach and gut, skeleton and skin (Mm, E) | DmRab32 | See DmRab32 | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab39a | **RNA**: Tissue enhanced (brain, pituitary gland and epithelial cells) – widespread | **RNA**: Not detected (Mm, E) | DmRab39 | **RNA:** ubiquitous (E+A)  **protein:** widespread (L), brain (A) | **H**: The human protein atlas, (Chen et al., 2003a) Chen et al., 2003  **R**: Transcriptome Atlas mouse embryo  **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2 |
| Rab39 b | **RNA**: Tissue enhanced (brain) – widespread  **protein**: Cytoplasmic and membranous expression in several tissues, including cerebral cortex | **RNA**: strong regional signal in the peripheral nervous system, ganglia (Mm, E), brain specific (Mm, A) | **H**: The human protein atlas,(Giannandrea et al., 2010)  **R**: Transcriptome Atlas mouse embryo, (Giannandrea et al., 2010) |
| Rab40a\*\* | **RNA**: Tissue enhanced (epididymis) – widespread | not in mouse | DmRab40 | **RNA:** ubiquitous (E+A), enriched in CNS (E)  **protein:** nervous system high (L), brain (A) | **H**: The human protein atlas  **Dm**: (Jin et al., 2012; Zhang et al., 2007), flyatlas2, this study |
| Rab40b | **RNA**: Tissue enhanced (brain) - ubiquitous | **RNA**: brain, inner ear and heart tissues (Mm, E+A) | **H**: The human protein atlas  **R**: (Bedoyan et al., 2012) |
| Rab40al\*\*  (RLGP) | **RNA**: Tissue enhanced (epididymis); human fetal and adult brain and kidney, and adult lung, heart, liver and skeletal muscle | not in mouse | **H**: The human protein atlas, (Bedoyan et al., 2012) |
| Rab40c | **RNA**: Tissue enhanced (pancreas) – ubiquitous | **RNA**: no regional signal | **H**: The human protein atlas  **R**: Transcriptome Atlas mouse embryo |
| Rab41 (Rab6d) \*\*\* | **RNA**: Tissue enhanced (brain, testis) - restricted | not in mouse | DmRab6 | See DmRab6 | **H**: The human protein atlas |
| Rab42 (Rab39c) | **RNA**: Tissue enhanced (lymphoid tissue) - widespread | no data | DmRab39 | See DmRab39 | **H**: The human protein atlas |
| Rab43 (Rab19b) | **RNA**: Tissue enriched (liver) – ubiquitous  **protein**: Cytoplasmic expression in several tissues. Strong positivity in colloid in thyroid gland as well | no data | DmRab19 | See DmRab19 | **H**: The human protein atlas |
| Rab44 | **RNA**: Tissue enhanced (blood, bone marrow) – widespread | **RNA**: highly expressed in the bone marrow and slightly expressed in the epididymis,  lung, skin, spleen, thymus, ovary, uterus, and liver (Mm, CC)  **protein**: bone marrow, spleen and thymus (Mm, CC) | -- | - | **H**: The human protein atlas  **R**: (Tokuhisa et al., 2020) |
| Rab45 | **RNA**: Low tissue specificity – widespread  **protein**: General cytoplasmic expression | no data | - | - | **H**: The human protein atlas |
| - | - | - | DmRabX1  (chrowded) | **RNA:** ubiquitous (A)  **protein:** nervous system high (L), brain (A) | **Dm**: (Chan et al., 2011), flyatlas2, this study |
| - | - | - | DmRabX4 | **RNA:** CNS(E), nervous system high (A)  **protein:** nervous system high (L), brain (A) | **Dm**: (Chan et al., 2011; Zhang et al., 2007), flyatlas2, this study |
| - | - | - | DmRabX6 | **RNA:** ubiquitous (E+A)  **protein:** nervous system high (L), brain (A) | **Dm**: (Jin et al., 2012; Zhang et al., 2007), flyatlas2, this study |

**References – Supplementary Table 2**

Bardin, S., Miserey-Lenkei, S., Hurbain, I., Garcia-Castillo, D., Raposo, G., and Goud, B. (2015). Phenotypic characterisation of RAB6A knockout mouse embryonic fibroblasts. Biol Cell *107*, 427-439.

Barral, D.C., Ramalho, J.S., Anders, R., Hume, A.N., Knapton, H.J., Tolmachova, T., Collinson, L.M., Goulding, D., Authi, K.S., and Seabra, M.C. (2002). Functional redundancy of Rab27 proteins and the pathogenesis of Griscelli syndrome. J Clin Invest *110*, 247-257.

Bedoyan, J.K., Schaibley, V.M., Peng, W., Bai, Y., Mondal, K., Shetty, A.C., Durham, M., Micucci, J.A., Dhiraaj, A., Skidmore, J.M.*, et al.* (2012). Disruption of RAB40AL function leads to Martin--Probst syndrome, a rare X-linked multisystem neurodevelopmental human disorder. J Med Genet *49*, 332-340.

Cammarato, A., Ahrens, C.H., Alayari, N.N., Qeli, E., Rucker, J., Reedy, M.C., Zmasek, C.M., Gucek, M., Cole, R.N., Van Eyk, J.E.*, et al.* (2011). A mighty small heart: the cardiac proteome of adult Drosophila melanogaster. PLoS One *6*, e18497.

Chan, C.C., Scoggin, S., Wang, D., Cherry, S., Dembo, T., Greenberg, B., Jin, E.J., Kuey, C., Lopez, A., Mehta, S.Q.*, et al.* (2011). Systematic discovery of Rab GTPases with synaptic functions in Drosophila. Curr Biol *21*, 1704-1715.

Chen, T., Han, Y., Yang, M., Zhang, W., Li, N., Wan, T., Guo, J., and Cao, X. (2003a). Rab39, a novel Golgi-associated Rab GTPase from human dendritic cells involved in cellular endocytosis. Biochem Biophys Res Commun *303*, 1114-1120.

Chen, X., Li, C., Izumi, T., Ernst, S.A., Andrews, P.C., and Williams, J.A. (2004). Rab27b localizes to zymogen granules and regulates pancreatic acinar exocytosis. Biochem Biophys Res Commun *323*, 1157-1162.

Chen, Y., Guo, X., Deng, F.M., Liang, F.X., Sun, W., Ren, M., Izumi, T., Sabatini, D.D., Sun, T.T., and Kreibich, G. (2003b). Rab27b is associated with fusiform vesicles and may be involved in targeting uroplakins to urothelial apical membranes. Proc Natl Acad Sci U S A *100*, 14012-14017.

Chua, C.E., Goh, E.L., and Tang, B.L. (2014). Rab31 is expressed in neural progenitor cells and plays a role in their differentiation. FEBS Lett *588*, 3186-3194.

Cohen-Solal, K.A., Sood, R., Marin, Y., Crespo-Carbone, S.M., Sinsimer, D., Martino, J.J., Robbins, C., Makalowska, I., Trent, J., and Chen, S. (2003). Identification and characterization of mouse Rab32 by mRNA and protein expression analysis. Biochim Biophys Acta *1651*, 68-75.

Echard, A., Opdam, F.J., de Leeuw, H.J., Jollivet, F., Savelkoul, P., Hendriks, W., Voorberg, J., Goud, B., and Fransen, J.A. (2000). Alternative splicing of the human Rab6A gene generates two close but functionally different isoforms. Mol Biol Cell *11*, 3819-3833.

Elferink, L.A., Anzai, K., and Scheller, R.H. (1992). rab15, a novel low molecular weight GTP-binding protein specifically expressed in rat brain. J Biol Chem *267*, 22693.

Giannandrea, M., Bianchi, V., Mignogna, M.L., Sirri, A., Carrabino, S., D'Elia, E., Vecellio, M., Russo, S., Cogliati, F., Larizza, L.*, et al.* (2010). Mutations in the small GTPase gene RAB39B are responsible for X-linked mental retardation associated with autism, epilepsy, and macrocephaly. Am J Hum Genet *86*, 185-195.

Goldenring, J.R., Shen, K.R., Vaughan, H.D., and Modlin, I.M. (1993). Identification of a small GTP-binding protein, Rab25, expressed in the gastrointestinal mucosa, kidney, and lung. J Biol Chem *268*, 18419-18422.

Guo, A., Wang, T., Ng, E.L., Aulia, S., Chong, K.H., Teng, F.Y., Wang, Y., and Tang, B.L. (2006). Open brain gene product Rab23: expression pattern in the adult mouse brain and functional characterization. J Neurosci Res *83*, 1118-1127.

Jin, E.J., Chan, C.C., Agi, E., Cherry, S., Hanacik, E., Buszczak, M., and Hiesinger, P.R. (2012). Similarities of Drosophila rab GTPases based on expression profiling: completion and analysis of the rab-Gal4 kit. PLoS One *7*, e40912.

Jin, R.U., and Mills, J.C. (2014). RAB26 coordinates lysosome traffic and mitochondrial localization. J Cell Sci *127*, 1018-1032.

Junutula, J.R., De Maziere, A.M., Peden, A.A., Ervin, K.E., Advani, R.J., van Dijk, S.M., Klumperman, J., and Scheller, R.H. (2004). Rab14 is involved in membrane trafficking between the Golgi complex and endosomes. Mol Biol Cell *15*, 2218-2229.

Lutcke, A., Jansson, S., Parton, R.G., Chavrier, P., Valencia, A., Huber, L.A., Lehtonen, E., and Zerial, M. (1993). Rab17, a novel small GTPase, is specific for epithelial cells and is induced during cell polarization. J Cell Biol *121*, 553-564.

Lutcke, A., Olkkonen, V.M., Dupree, P., Lutcke, H., Simons, K., and Zerial, M. (1995). Isolation of a murine cDNA clone encoding Rab19, a novel tissue-specific small GTPase. Gene *155*, 257-260.

Lutcke, A., Parton, R.G., Murphy, C., Olkkonen, V.M., Dupree, P., Valencia, A., Simons, K., and Zerial, M. (1994). Cloning and subcellular localization of novel rab proteins reveals polarized and cell type-specific expression. J Cell Sci *107 ( Pt 12)*, 3437-3448.

Masuda, E.S., Luo, Y., Young, C., Shen, M., Rossi, A.B., Huang, B.C., Yu, S., Bennett, M.K., Payan, D.G., and Scheller, R.H. (2000). Rab37 is a novel mast cell specific GTPase localized to secretory granules. FEBS Lett *470*, 61-64.

Ng, E.L., Wang, Y., and Tang, B.L. (2007). Rab22B's role in trans-Golgi network membrane dynamics. Biochem Biophys Res Commun *361*, 751-757.

Olkkonen, V.M., Peterson, J.R., Dupree, P., Lutcke, A., Zerial, M., and Simons, K. (1994). Isolation of a mouse cDNA encoding Rab23, a small novel GTPase expressed predominantly in the brain. Gene *138*, 207-211.

Opdam, F.J., Echard, A., Croes, H.J., van den Hurk, J.A., van de Vorstenbosch, R.A., Ginsel, L.A., Goud, B., and Fransen, J.A. (2000). The small GTPase Rab6B, a novel Rab6 subfamily member, is cell-type specifically expressed and localised to the Golgi apparatus. J Cell Sci *113 ( Pt 15)*, 2725-2735.

Sollner, J.F., Leparc, G., Hildebrandt, T., Klein, H., Thomas, L., Stupka, E., and Simon, E. (2017). An RNA-Seq atlas of gene expression in mouse and rat normal tissues. Sci Data *4*, 170185.

Tokuhisa, M., Kadowaki, T., Ogawa, K., Yamaguchi, Y., Kido, M.A., Gao, W., Umeda, M., and Tsukuba, T. (2020). Expression and localisation of Rab44 in immune-related cells change during cell differentiation and stimulation. Sci Rep *10*, 10728.

Verhoeven, K., De Jonghe, P., Coen, K., Verpoorten, N., Auer-Grumbach, M., Kwon, J.M., FitzPatrick, D., Schmedding, E., De Vriendt, E., Jacobs, A.*, et al.* (2003). Mutations in the small GTP-ase late endosomal protein RAB7 cause Charcot-Marie-Tooth type 2B neuropathy. Am J Hum Genet *72*, 722-727.

Yoshie, S., Imai, A., Nashida, T., and Shimomura, H. (2000). Expression, characterization, and localization of Rab26, a low molecular weight GTP-binding protein, in the rat parotid gland. Histochem Cell Biol *113*, 259-263.

Young, J., Menetrey, J., and Goud, B. (2010). RAB6C is a retrogene that encodes a centrosomal protein involved in cell cycle progression. J Mol Biol *397*, 69-88.

Zhang, J., Schulze, K.L., Hiesinger, P.R., Suyama, K., Wang, S., Fish, M., Acar, M., Hoskins, R.A., Bellen, H.J., and Scott, M.P. (2007). Thirty-one flavors of Drosophila rab proteins. Genetics *176*, 1307-1322.

Zhao, S., Torii, S., Yokota-Hashimoto, H., Takeuchi, T., and Izumi, T. (2002). Involvement of Rab27b in the regulated secretion of pituitary hormones. Endocrinology *143*, 1817-1824.

Zheng, J.Y., Koda, T., Arimura, Y., Kishi, M., and Kakinuma, M. (1997). Structure and expression of the mouse S10 gene. Biochim Biophys Acta *1351*, 47-50.

Zheng, J.Y., Koda, T., Fujiwara, T., Kishi, M., Ikehara, Y., and Kakinuma, M. (1998). A novel Rab GTPase, Rab33B, is ubiquitously expressed and localized to the medial Golgi cisternae. J Cell Sci *111 ( Pt 8)*, 1061-1069.