

| Supplementary Table 1. RNAi Lines Screened (using MS1096-GAL4 driver) | | | | | | |
|---|---------|---|----------------------------------|------------------------------------|-----------------------------------|--|
| BL#/VRDC# | CG# | Gene Name | Wing Defect % Penetrance Male | Wing Defect % Penetrance Female | Wing Defect % Penetrance Total | Defect Phenotypes |
| Calcium Channels | | | | | | |
| BL27263 | CG9126 | Stromal interaction molecule (Stim) | 100 | 100 | 100 | Wings small and malformed, thick veins, blisters |
| BL31292 | CG31284 | water witch (wtrw) | 69 | 39 | 53 | PCV incomplete |
| BL31295 | CG5842 | nanchung (nan) | 84 | 32 | 54 | L5 incomplete, L5 bifurcation |
| BL25937 | CG1063 | Inositol 1,4,5,-tris-phosphate receptor (Itpr83A) | 29 | 26 | 27 | L4 bifurcation |
| BL26251 | CG15899 | Ca2+-channel protein α 1 subunit T (Ca- α 1T) | 73 | 25 | 52 | Incomplete L5, L4 bifurcation |
| BL31385 | CG13762 | brivido-3 (brv3) | 46 | 12 | 30 | L5 bifurcation, PCV incomplete |
| BL27244 | CG43368 | Cacophony (Cac) | 64 | 0 | 32 | |
| BL31384 | CG5751 | Transient receptor potential cation channel A1 (TrpA1) | 26 | 0 | 12 | PCV incomplete, L5 bifurcation, L4 incomplete |
| BL31496 | CG9472 | brivido-1 (brv1) | 23 | 0 | 10 | PCV bifurcation |
| Sodium Channels | | | | | | |
| BL25847 | CG1058 | ripped pocket (rpk) | 100 | 85 | 92 | L5 incomplete & bifurcation, L4 bifurcation |
| BL27088 | CG33349 | pickpocket 25 (ppk25) | 22.2 | 37.2 | 29.7 | PCV bifurcation, L5 bifurcation |
| BL25810 | CG18110 | pickpocket 30 (ppk30) | 73 | 30 | 55 | PCV incomplete, L4 & L5 bifurcations, L5 incomplete, ectopic veins |
| BL25849 | CG12048 | pickpocket 21 (ppk21) | 100 | 25 | 66 | Crumpled with venation defect, crumpled wg, necrotic spot, bristle |
| BL26006 | CG15555 | pickpocket 24 (ppk24) | 100 | 23 | 63 | Crumpled wg, venation defect, crumpled, bristle, pcv br |
| BL25817 | CG33508 | pickpocket 13 (ppk13) | 50 | 18 | 33 | PCV incomplete, L4 bifurcation, ectopic veins |
| BL28012 | CG14239 | pickpocket 15 (ppk15) | 50 | 18 | 32 | PCV & L5 bifurcations, PCV incomplete, ectopic vein |
| BL25922 | CG9499 | pickpocket 7 (ppk7) | 13 | 17 | 15 | PCV bifurcation, PCV incomplete |
| BL27091 | CG9501 | pickpocket 14 (ppk14) | 50 | 15 | 29 | PCV & L5 bifurcation, PCV incomplete, ectopic vein |
| BL25825 | CG8546 | pickpocket 26 (ppk26) | 50 | 10 | 25 | |
| BL29571 | CG3478 | pickpocket (ppk) | 82 | 7 | 36 | |
| BL26249 | CG1232 | temperature-induced paralytic E (tipE) | 39 | 6 | 24 | L5 bifurcation |
| Potassium Channels | | | | | | |
| VDCR28430 | CG44159 | Inwardly rectifying potassium channel 1 (Irk1) | 100 | 90.5 | 94.7 | L5 & L4 bifurcations, loss of ACV, thick veins |
| VDCR108140 | CG4370 | Inwardly rectifying potassium channel 2 (Irk2) | 92.8 | 84.6 | 88.8 | L5 & L4 bifurcations, loss of ACV, thick veins |

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|-------------------------------------|---------|--|------|-----|------|--|
| VDRC101174 | CG10369 | Inwardly rectifying potassium channel 3 (Irk3) | 100 | 30 | 47.3 | L5 & L4 bifurcations, loss of ACV, thick veins |
| BL26011 | CG34396 | N/A | 45.4 | 7 | 28 | PCV & L5 bifurcations, PCV incomplete, thickened veins |
| BL27264 | CG9361 | TWIK-related acid-sensitive K ⁺ channel 7 (Task7) | 34 | 6 | 20 | PCV incomplete, L3 bifurcation, ectopic vein |
| BL25853 | CG8713 | sandman (sand) | 94 | 6 | 52 | L4 abnormalities |
| BL51014 | CG2121 | N/A | 62 | 4 | 35 | Missing ACV, ACV incomplete, PCV incomplete, PCV bifurcation |
| BL25878 | CG10864 | N/A | 25 | 0 | 11.3 | PCV incomplete, L5 bifurcation |
| BL25921 | CG9194 | N/A | 73 | 0 | 41 | PCV incomplete, L5 bifurcation, ectopic vein |
| Chloride Channels | | | | | | |
| BL42654 | CG10173 | Bestrophin 2 (Best2) | 100 | 100 | 100 | Wings small and severely malformed |
| BL39040 | CG12327 | Bestrophin 3 (Best3) | 100 | 40 | 66 | Small narrow wings (male), missing ACV, L2 bifurcation, PCV incomplete |
| BL28013 | CG14723 | Histamine-gated chloride channel subunit 1 (HsCl1) | 26 | 8 | 17 | L4/L5 bifurcation, Incomplete L5, missing ACV |
| Ligand-gated Cation Channels | | | | | | |
| BL62391 | CG15326 | Ionotropic receptor 7b (Ir7b) | 86 | 97 | 92 | PCV incomplete or bifurcation, L5 bifurcation |
| BL34678 | CG42584 | Ionotropic receptor 76a (Ir76a) | 97 | 46 | 74 | PCV incomplete, L5 bifurcation |
| BL53975 | CG17382 | Ionotropic receptor 94h (Ir94h) | 24 | 29 | 27 | Bristle defects |
| BL25836 | CG4226 | Glutamate receptor IIC (GluRIIC) | 24 | 24 | 14 | L4 & L5 bifurcations, L5 incomplete |
| BL61898 | CG15732 | Ionotropic receptor 11a (Ir11a) | 2.7 | 23 | 12 | |
| BL25813 | CG32704 | Ionotropic receptor 8a (Ir8a) | 93 | 20 | 58 | PCV bifurcation, L4 & L5 bifurcations, PCV incomplete, ectopic veins |
| BL25895 | CG6927 | N/A | 73 | 16 | 39 | PCV incomplete, L5 bifurcation |
| BL28351 | CG8681 | Clumsy | 36 | 14 | 26 | Incomplete PCV, L4 & L5 bifurcations, ectopic veins, bristle defects |
| BL25854 | CG8916 | N/A | 83 | 13 | 50 | PCV incomplete, L4 & L5 bifurcations, ectopic veins |
| BL77160 | CG15324 | Ionotropic receptor 7c (Ir7c) | 54 | 13 | 32 | Incomplete PCV & L5, L5 bifurcations, ectopic veins |
| BL57772 | CG11775 | Ionotropic receptor 85a (Ir85a) | 38 | 13 | 24 | |
| BL50668 | CG17336 | Ligand-gated chloride channel homolog 3 (Lcch3) | 86 | 12 | 49 | PCV& ACV incomplete, L4 & L5 bifurcations, L4 & L5 incomplete |
| BL26009 | CG17922 | Cyclic nucleotide-gated ion channel subunit B (CngB) | 82 | 11 | 44 | PCV bifurcation, L4 & L5 bifurcations, ectopic veins, bristle defects |
| BL25927 | CG11822 | nicotinic Acetylcholine Receptor β 3 (nAChR β 3) | 38 | 6 | 22 | PCV & L5 bifurcations, PCV incomplete |
| BL29451 | CG3814 | Lifeguard (Lfg) | 64 | 5 | 38 | |
| BL27090 | CG7589 | N/A | 50 | 4 | 27 | L3 & L4 & L5 bifurcations, PCV incomplete |
| BL31991 | CG11155 | N/A | 55 | 3 | 31 | |

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|--------------|---------------------|---|------|----|------|---|
| BL31883 | CG11348 | nicotinic Acetylcholine Receptor $\beta 1$ (nAChR $\beta 1$) | 15 | 3 | 9 | L4 & L5 bifurcations, bristle defects |
| BL27493 | CG6844 | nicotinic Acetylcholine Receptor $\alpha 2$ (nAChR $\alpha 2$) | 29 | 1 | 13 | PCV bifurcations, L5 bifurcations, ectopic veins |
| BL58056 | CG33492 | Ionotropic receptor 41a (Ir41a) | 38 | 0 | 18 | |
| BL57566 | CG42352 | Ionotropic receptor 40a (Ir40a) | 20.4 | 0 | 10.3 | ACV missing |
| Other | | | | | | |
| BL34078 | CG33348 | Chemosensory protein B 42a (CheB42a) | 93 | 54 | 69 | PCV incomplete or bifurcation, L2, L4 & L5 bifurcation, L5 incomplete |
| BL30501 | CG1448 | Innexin 3 (Inx3) | 98 | 38 | 68 | PCV incomplete, L4 bifurcation, L5 bifurcation, L5 incomplete |
| BL25806 | CG1090 | N/A | 45 | 9 | 20 | PCV bifurcations, PCV incomplete, L4 & L5 bifurcations |
| BL62985 | CG4545 | Serotonin transporter (SerT) | 100 | 0 | 48 | L3 bifurcations, thickened veins, ectopic veins |
| BL26007 | CG17140; CG17139 | N/A | 40 | 0 | 17.3 | |
| BL25886 | CG17137 | Porin2 | 29 | 0 | 14 | PCV incomplete, L4 & L5 bifurcations |
| BL31673 | CG8743 | Transient receptor potential cation channel, mucolipin (Trmp1) | 26 | 0 | 13 | L4 & L5 bifurcations, incomplete PCV, ectopic veins |

