**Supporting Information Legends**

**Fig. S1. Intrinsically active Rolled variants compensate for the loss of wing vein material caused by expression of RasDN.** (**A-D**) Wings of transgenic females expressing RasDN alone (**A**), RasDN together with control LacZ (**B**), or along with RolledWT (**C**) and RolledR80S (**D**) under *MS1096-GAL4* regulation. RasDN expression results in a reduced wing size and loss of vein material (**A**, black arrows; cf. normal wing in Fig. **1A**). Co-expression of either LacZ (**B**) or RolledWT (**C**) does not suppress vein loss. In contrast, co-expression of RolledR80S (**D**) results in partial rescue. Arrowheads in **C-D** denote the L3 vein (red), the distal part of the L4 vein (black) and the L5 vein (blue), or the position where they should have formed. (**E**) Bar graph showing the percentage of wings co-expressing RasDN together with RolledWT (open bars) or with RolledR80S (filled bars), in which there is a complete rescue of L3 vein (red), partial rescue of the distal part of the L4 vein (black) or partial rescue of the L5 vein (blue). 40 wings from each definitive genotype were scored in each case.

(**F-G**) Wings of transgenic females expressing RasDN together with RolledD334N (**F**) or RolledR80S+D334N (**G**) under *MS1096-GAL4* regulation. Co-expression of RolledD334N together with RasDN effectually restores all wing veins and induces formation of extra vein tissue in intervein regions (**F**, purple arrowheads). Co-expression of RasDN together with RolledR80S+D334N (**G**) further enhances ectopic vein formation (darker pigmentation; arrowheads). (**H**) Bar graph showing the number of ectopic veins that develop in wings co-expressing RasDN together with RolledD334N (open bars) or with RolledR80S+D334N (filled bars). Extra vein material was classified by its size: large (orange), medium (green) or small (purple) (see arrowheads in panels **F-G**). 30 wings from each definitive genotype were scored.

**Fig. S2. Intrinsically active Rolled variants rescue wing venation phenotypes brought about by RafDN expression.** (**A-D**, **F-G**) Wings of transgenic females expressing RafDN alone (**A**), RafDN together with LacZ (**B**) or jointly with distinct Rolled derivatives under *MS1096-GAL4* regulation (**C-D**, **F-G**). (**A-D**) Reduced EGFR signaling, brought about by the expression of RafDN, results in a smaller wing size and loss of vein material (**A**, black arrowheads; cf. normal wing in Fig. **1A**). Loss of vein material is not suppressed by co-expression of either LacZ (**B**) or RolledWT (**C**) together with RafDN. In contrast, co-expression of RolledR80S (**D**) together with RafDN results in partial rescue. Arrowheads in **C-D** point to the proximal part of the L3 vein (red), the distal part of the L4 vein (black) and the L5 vein (blue), or the position where they should have formed. (**E**) Bar graph showing the percentage of wings co-expressing RafDN together with RolledWT (open bars) or with RolledR80S (filled bars), in which there is a partial rescue of the proximal part of the L3 vein (red), partial rescue of the distal part of the L4 vein (black) or complete rescue of the L5 vein (blue). 40 wings from each definitive genotype were scored in each case.

(**F-G**) Co-expression of RolledD334N together with RafDN completely restores all veins and leads to the formation of extra vein material (**F**, red asterisks). Co-expression of RolledR80S+D334N together with RafDN (**G**) further enhances formation of extra vein material (darker pigmentation; red asterisks).

**Fig. S3. Quantifying the overgrowth caused by expression of intrinsically active Rolled variants in scrib-/- mutant clones.** Bar graph showing GFP intensity labelling of the induced clones for the genotypes indicated. \*\*\* P<0.001, \*\* P<0.01, n.s. P>0.05 compared to flies with scrib-/- clones. Data represents the mean ± SD (Student's *t*-test).