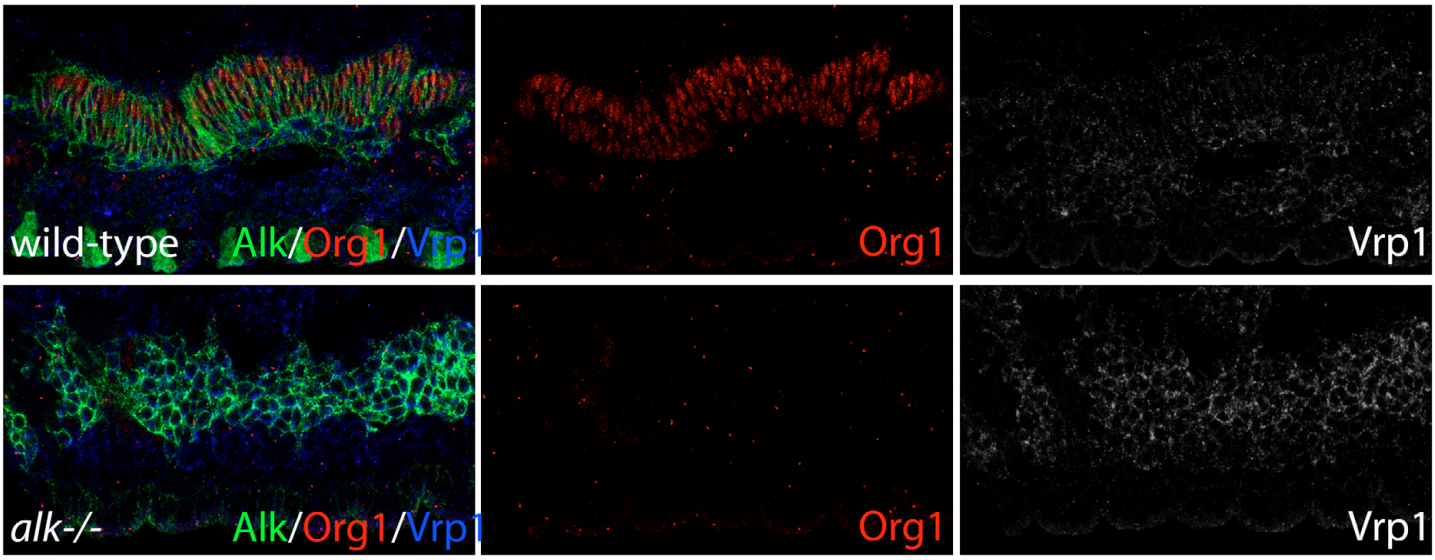

Fig. S1. *alk* mutant VM cells are Org-1 negative and Vrp1 positive. (Upper panel) In wild-type embryos (stage 13), Org-1 protein (red) is observed in the fusing cells of the VM. All VM cells express Alk (green). (Lower panel) Org-1 protein (red) expression is absent in VM cells of *alk*$^{-/-}$ embryos. Vrp1-positive cells denoted in white or blue (merged panel).

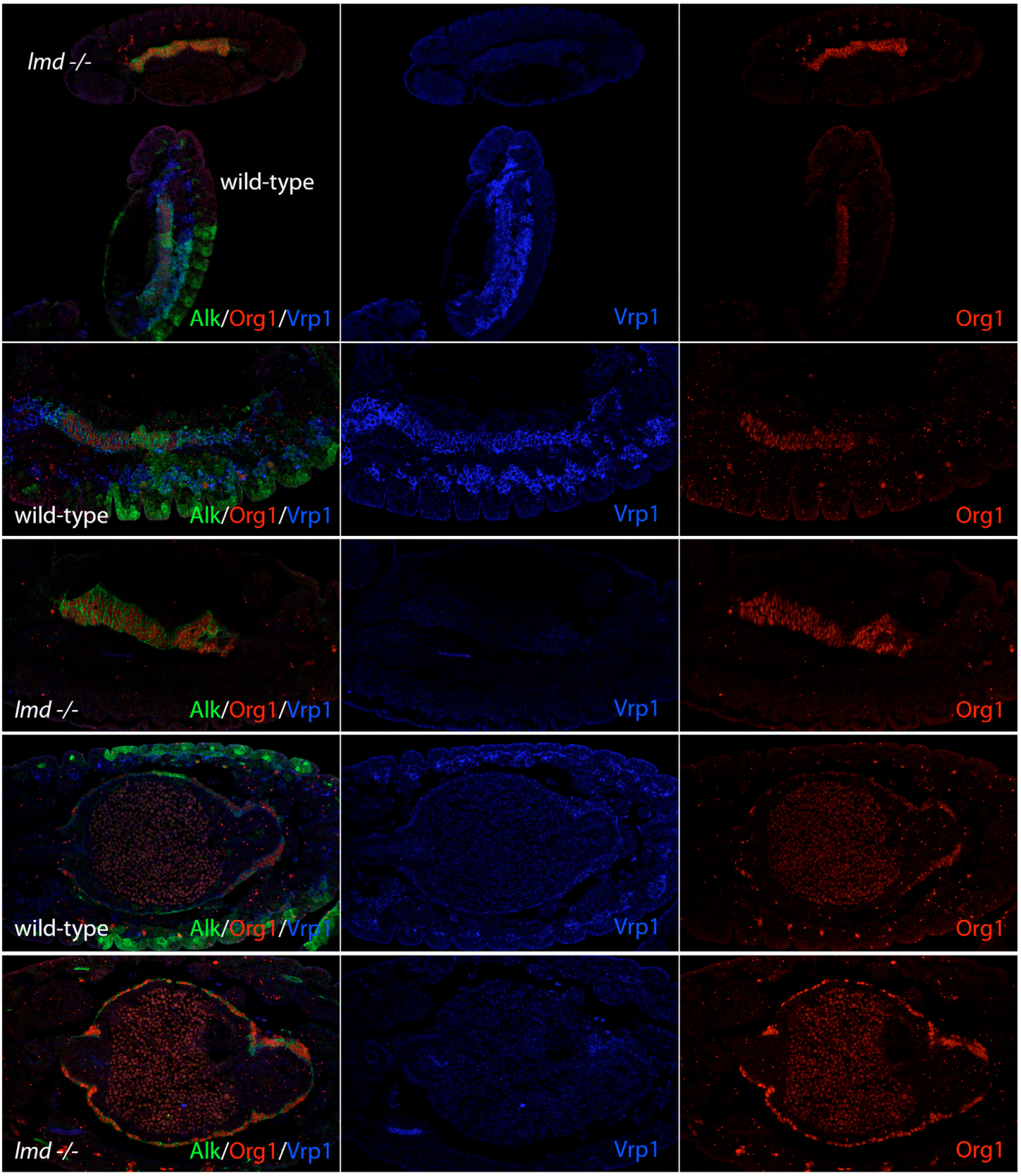

Fig. S2. VM in *lmd* mutants fail to express Vrp1 protein at later stages of embryonic development. In wild-type embryos, Org-1 protein (red) is observed in the fusing cells of the VM, together with Vrp1 protein (blue). All VM cells express Alk (green). VM cells in *lmd*$^{-/-}$ embryos (marked with Alk in green) robustly express Org-1 (red) but lack Vrp1 protein (blue).

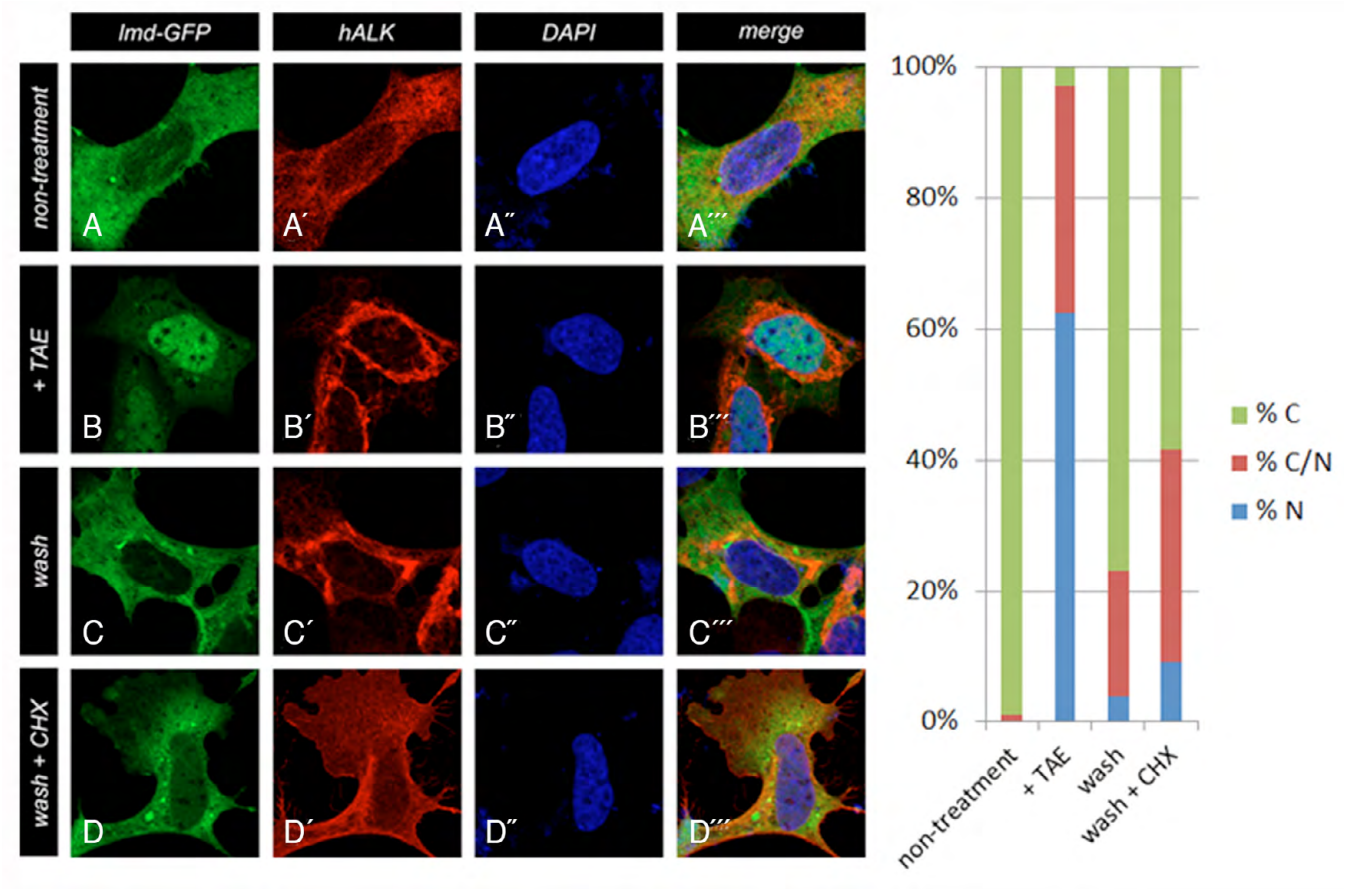

Fig. S3. ALK activity-dependent Lmd translocation does not require *de novo* protein synthesis. HEK293 cells transfected with Lmd-GFP and gain-of-function human ALK^{F1174S} were pretreated with 0.2 µM NVP-TAE684, a specific ALK inhibitor, for 18 hours. Following a 2-hour pretreatment with 50 µg/ml cycloheximide (CHX) to block *de novo* protein synthesis, NVP-TAE684 was washed away and cells were further incubated for 30 minutes in the presence of CHX. ALK was visualized by immunostaining (red) and nuclei marked by DAPI (blue). (**A**,**B**) Translocation of Lmd protein (green) to cytosol in non-treated cells (A) is blocked in the presence of NVP-TAE684 (B). (**C**,**D**) After removal of ALK inhibitor, Lmd protein re-distributes to cytosol (C), even in the presence of CHX (D). Subcellular localisation of Lmd protein is quantified on the right. C, cytosol; N, nucleolus; C/N, both.

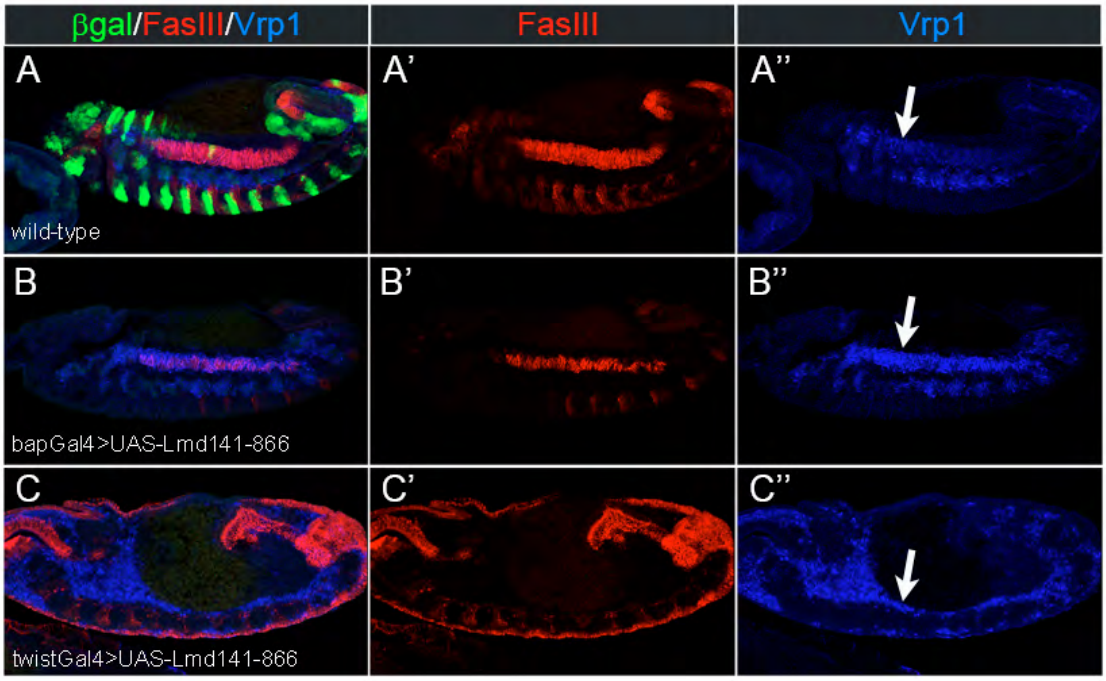

Fig. S4. Expression of the Lmd$^{141-866}$ mutant protein in the mesoderm drives robust expression of Vrp1. (**A-A″**) In wild-type embryos (stage 13), Vrp1 protein (blue) is observed in the FCM of the VM and is downregulated after fusion (arrow). (**B-B″**) All VM cells in *bapGal4>UAS-lmd$^{141-866}$*-expressing embryos (marked with Fas3 in red) express high levels of Vrp1 (blue, arrow), which is not downregulated. (**C-C″**) In *twistGal4>UAS-lmd$^{141-866}$*, both VM and SM express high levels of the Lmd target Vrp1 (blue, arrow). No Fas3-positive VM can be observed (red).

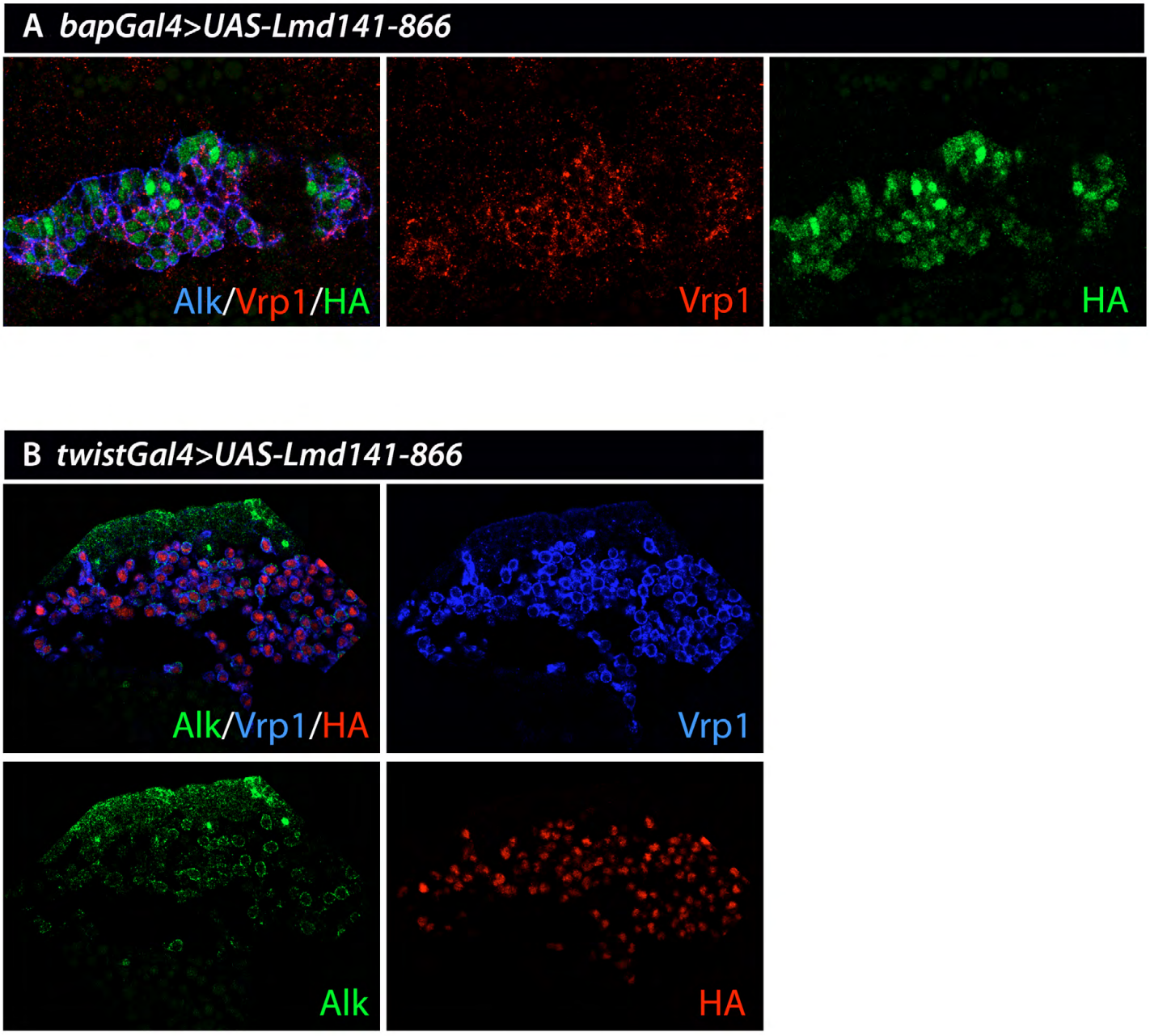

Fig. S5. The Lmd$^{141-866}$ mutant protein persists in Alk positive VM cells. (**A**) VM FCs in *bapGal4>UAS-lmd$^{141-866}$*-expressing embryos (marked with Alk in blue) express Vrp1 (red). Both FCs and FCMs display nuclear Lmd$^{141-866}$ mutant protein (HA in green). (**B**) In *twistGal4>UAS-lmd$^{141-866}$*, both visceral and somatic mesoderm persistently express nuclear Lmd$^{141-866}$ mutant protein (HA in green). This is associated with high levels of expression of the Lmd target Vrp1 (blue) in these cells. In this case, a subset of the Vrp1, Lmd-positive cells are Alk positive (green).