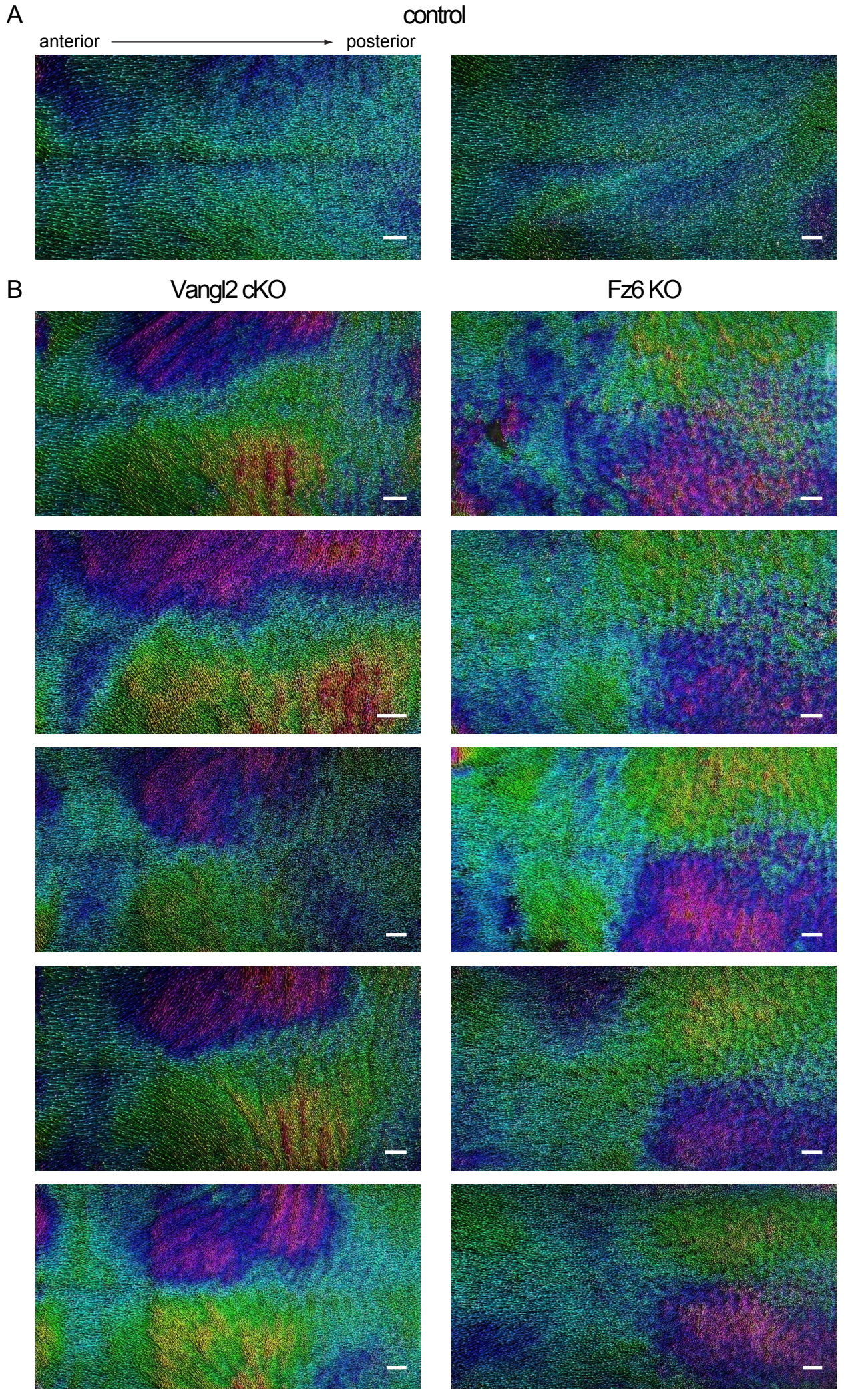

Figure S1

Figure S1. **Vangl2 cKO and Fz6 KO hair patterns are highly reproducible.** (A-B) Additional examples of the hair patterns observed at P4 in control (A), Vangl2cKO (B, left), and Fz6 KO (B, right) conditions. Hair follicles are pseudo-colored according to their angle using Orientation J. Green-blue represents hair follicles oriented closest to the AP axis ~ 0 to +/- 45 degrees, anterior-posterior axis. Pink-purple ~ -45 to -90 degrees. Orange-yellow ~ +45 to +90 degrees. Note the direction of hair follicle orientation is spatially conserved between mutant animals of the same genotype. Scale bar, 1 mm.

Vangl1;Vangl2 cKO

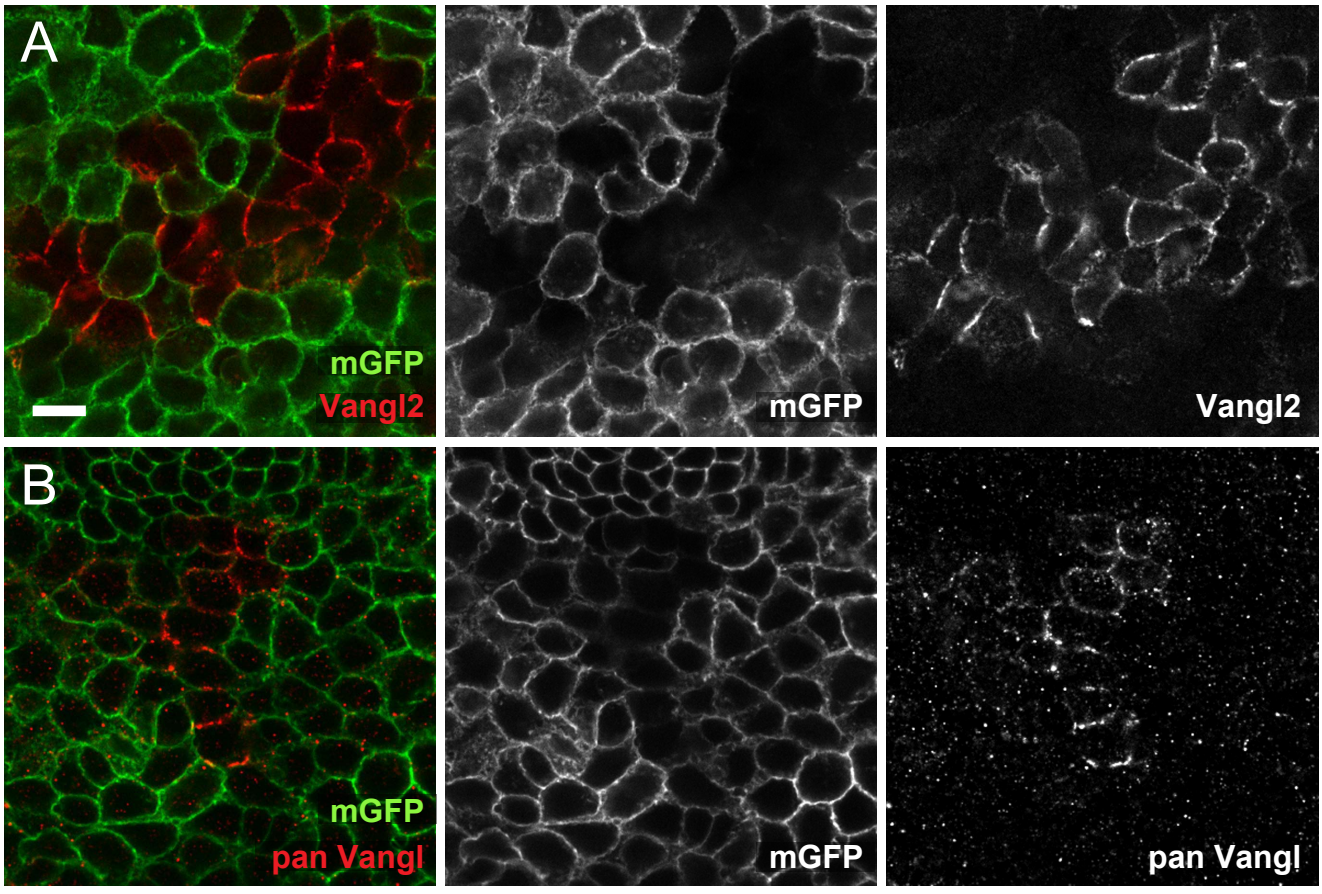

Figure S2. **Vangl protein is lost by e15.5 in Vangl1; Vangl2 dcKO.** (A,B) Vangl staining in a mosaic region of the interfollicular epidermis at e15.5 in a Vangl1; Vangl2 dcKO embryo. The membrane GFP signal (green) indicates K14-Cre activity. Antibodies specific to Vangl2 (A, red) or one that detects both Vangl1 and Vangl2 (B, red) were used to determine Vangl knockdown in Cre expressing cells. Vangl protein is diminished in cells expressing membrane GFP. Images are single confocal planes. Scale bar, 10 um.

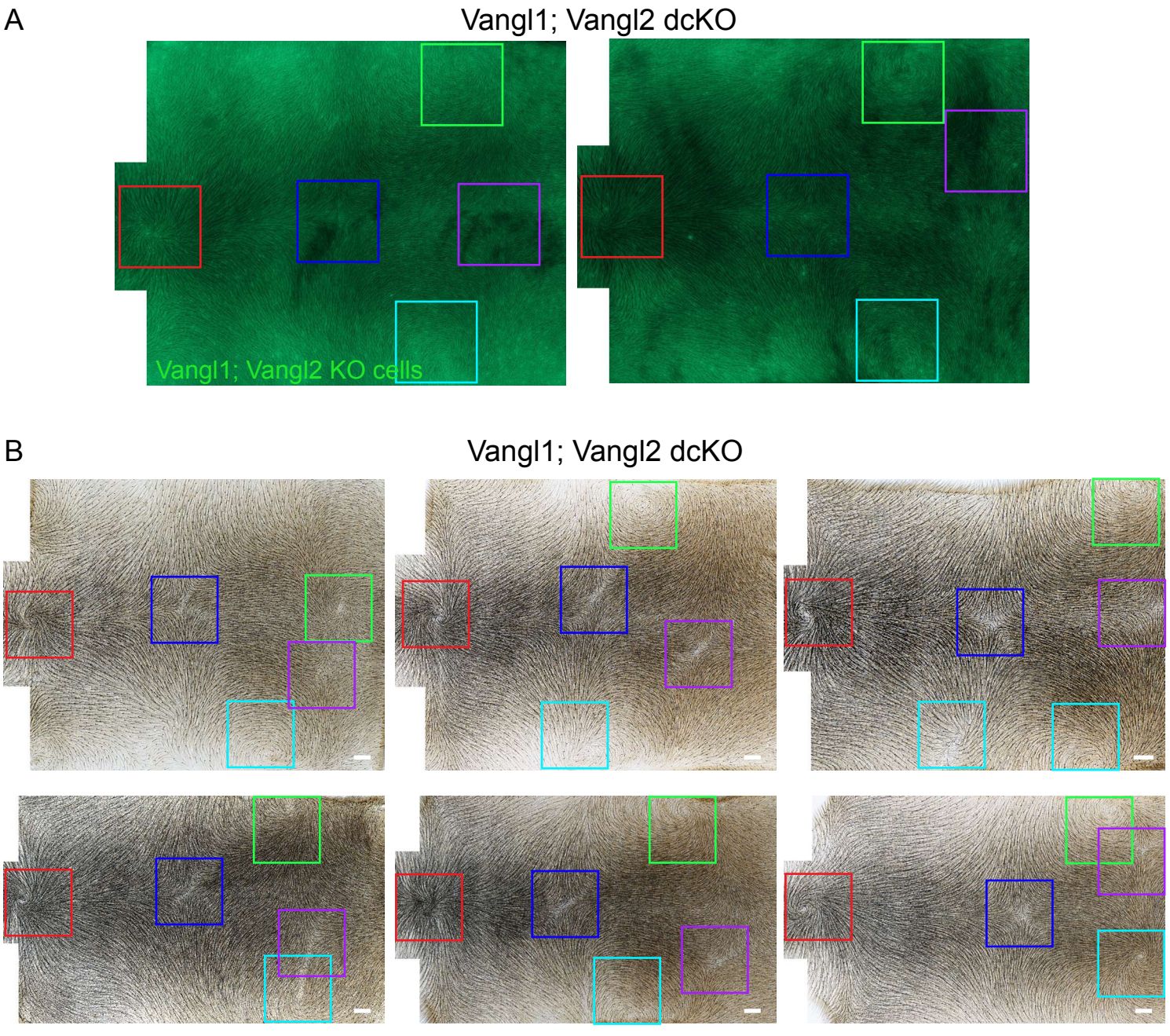

Figure S3. **Stereotyped hair patterns emerge postnatally in the absence of Vangl function.** (A,B) Backskin from P7 Vangl1; Vangl2 dcKO animals show highly reproducible hair follicle patterns. (A) Membrane GFP expression shows mosaicism due to K14-Cre activity within two mutant skins. Epidermal cells expressing GFP lack Vangl protein. Despite differences in Cre activity, both skins display local whorls (red, cyan, and green boxed regions) and crosses (blue and purple boxed regions). Images were aquired on a dissecting microscope using a fluorescence illuminating system. (B) Additional examples of the P7 Vangl1; Vangl2 dcKO hair pattern. Brightfield images were taken of BABB cleared backskins. Scale bar, 1 mm.

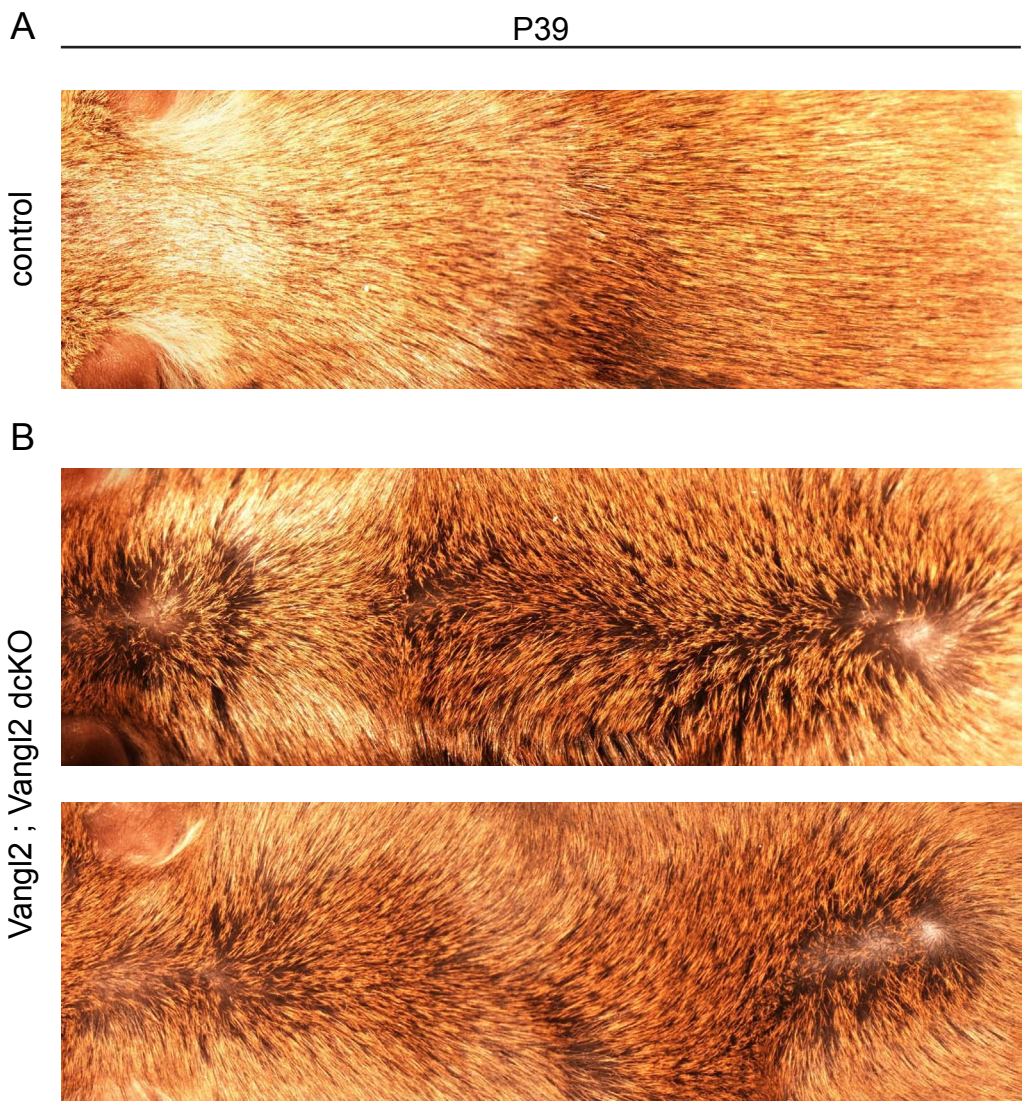

Figure S4. **Hair patterns do not correct in the absence of Vangl function**. Additional examples of control (A) and Vangl1;Vangl2 dcKO (B) hair patterns at P39. Brightfield images were taken on a dissecting microscope.