Supplemental Figure Legends

Supplemental Figure 1. **PV IgG colocalize with Dsg3.** Keratinocytes were exposed to PV IgG and the Dsg3 monoclonal antibody AK15 at 4ºC for 20 minutes and subsequently shifted to 37ºC for 1, 3, 6, and 24 hours. The localization of both human IgG and AK15 were monitored by immunofluorescence microscopy. Throughout the time course human IgG and the Dsg3 monoclonal antibody AK15 colocalize. In cells incubated at 4ºC (A-C), PV IgG and AK15 both label cell borders. After 1 hour, the PV IgG-Dsg3 and AK15-Dsg3 complexes localize in areas away from cell-cell borders. Keratinocytes treated with PV IgG for 3 and 6 hours (G-L) exhibit a rearrangement of Dsg3 into linear arrays emanating from cell borders. Following treatment with PV IgG for 24 hours (M-O) both human IgG and AK15-Dsg3 are depleted and co-localize in areas away from cell-cell borders and in large clusters at cell contacts. *Bar*, 10μm.

Supplemental Figure 2. **PV IgG decreases steady state Dsg3 protein levels.** Sequential detergent extraction and western blot analysis was carried out to determine if membrane associated (Triton X-100 soluble) and cytoskeleton associated (Triton X-100 insoluble) pools of various desmosomal components were depleted in response to 24 hour PV IgG treatment. Neither desmoplakin nor plakoglobin exhibited decreases in either the soluble or insoluble pools by PV IgG. The insoluble pool of Desmocollin-2 (Dsc-2) slightly decreased in cells incubated with PV IgG. Importantly, both the soluble and insoluble pools of Dsg3 are noticeably reduced by PV IgG. GAPDH and cytokeratin were used as loading controls for the Triton soluble and insoluble fractions, respectively.

Supplemental Figure 3. **Tracer amounts of the Dsg3 monoclonal antibody AK23 do not cause alterations in Dsg3 localization.** Cell surface Dsg3 was labeled with AK23 at 4°C for 30 minutes as a tracer to monitor Dsg3 localization (A-D). Unbound AK23 IgG was removed and the cells were incubated with NH IgG (A-B) or PV IgG (C-D). Cells were then either fixed (A, C) or shifted to 37ºC for 6 hours.

Note that surface labeling with AK23 in the presence of NH IgG does not cause significant changes in Dsg3 distribution, whereas addition of PV IgG dramatically alters the distribution of cell surface AK23-Dsg3. *Bar*, 2.5μm

Supplemental Figure 4. **PV IgG and actin depolymerization act synergistically to decrease steady state desmosomal protein levels.** Sequential detergent extraction and western blot analysis was carried out to determine if membrane associated (Triton X-100 soluble) and cytoskeleton associated (Triton X-100 insoluble) pools of various desmosomal components were depleted in response to 24 hour treatment with PV IgG and latrunculin A. No changes in desmosomal protein levels were observed in cells treated with NH IgG and latrunculin A for 24 hours. Both the soluble and insoluble pools of Dsg3 were reduced by PV IgG in the absence and presence of latrunculin A. Additionally, PV IgG and latrunculin A treatment caused a modest decrease in the soluble pools of desmocollin-2 (Dsc2) and plakoglobin. The insoluble pools of desmoplakin, Dsc2 and plakoglobin were reduced similarly to Dsg3 in PV IgG and latrunculin A treated cells. GAPDH and cytokeratin were used as loading controls for the Triton soluble and insoluble fractions, respectively.

Supplemental Movie 1: The Dsg3 monoclonal antibody AK15 was fluorescently labeled with Alexa Fluor-555 and incubated with living keratinocytes at 4ºC. Excess antibody was removed, PV IgG was added to the medium, and cells were shifted to 37ºC and imaged every three minutes for 3 hours and 51 minutes. The AK23-Dsg3 complex is first clustered by PV IgG into puncta, followed by disruption of Dsg3 at cell-cell borders. Each time point represents a single projection of 10 images taken through the z-axis at 0.8μm intervals. Projection images are shown at a rate of 10 frames/second.

Supplemental Movie 2: Figure 4 Panels A-D: Keratinocytes were labeled with AK23 tagged with Alexa-Fluor 555 at 4ºC, shifted to 37ºC in medium containing PV IgG and imaged every 10 seconds for 9 minutes. In response to PV IgG, AK23-Dsg3 molecules rapidly form punctate clusters. Each panel

represents a single projection of 9 z-axis images at 0.5μm images. Projection images are shown at a rate of 10 frames/second.

Supplemental Movie 3: Figure 5 Panels A-D: Alexa-Fluor 555 tagged AK 23 was incubated with living keratinocytes at 4ºC to label Dsg3. Excess tagged AK23 was removed and PV IgG was added to the medium. After shifting cells to 37ºC, time lapse imaging was initiated every two minutes for 2 hours and 20 minutes.AK23-Dsg3 molecules reorganize from cell contacts into linear arrays that extend perpendicularly from cell borders (Fig. 5A-C and Supplemental Movie 3). Furthermore, AK23-Dsg3 complexes are released from the tips of these linear arrays. Single projection images at each time point were compiled using 6 z-axis slices at 0.5μm intervals. Projection images are shown at a rate of 10 frames/second.

Supplemental Movie 4: Figure 8 Panels N-Q: Living keratinocytes were labeled at 4ºC with Alexa-Fluor tagged AK15. The fluorescent antibody was removed, PV IgG was added to the medium, and cells were shifted to 37ºC. Time lapse imaging occurred every two minutes for two hours. In response to PV IgG, AK23-Dsg3 molecules form punctate clusters. Linear arrays form and extend perpendicularly from cell borders. Each panel represents a projection image of 6 slices through the z-axis at a 1μm interval, and these images are shown at a rate of 15 frames/second.

Supplemental Movie 5: Figure 8 Panels R-U: Keratinocytes were pretreated with 250nM latrunculin A for 1 hour to inhibit actin polymerization and then labeled at 4ºC with Alexa-Fluor tagged Dsg3 antibody, AK15. Excess AK15 was removed and keratinocyte medium was replaced containing PV IgG and latrunculin A. Keratinocytes were shifted to 37°C and imaged every two minutes for two hours. In response to PV IgG and latrunculin A, AK23-Dsg3 molecules form large aggregates that appear to be rapidly internalized. Six 1μm slices were taken at each time point through the z-axis. Projection images of the six slices were combined and shown at a frame rate of 15 frames/second.