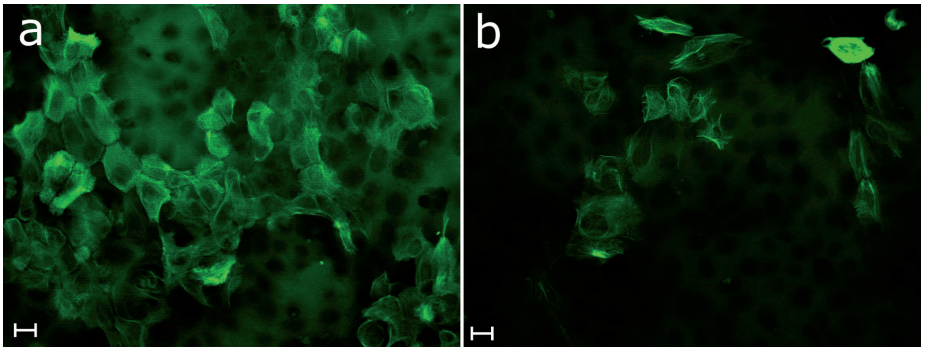

Fig. S1. Keratin 10 (K10) protein expressions is decreased after all-*trans*-retinoic acid (ATRA) exposure of differentiated epidermolytic ichthyosis (EI) keratinocytes. Keratin expression were analysed in EI cells by immunofluorescence in (a) unstressed cells exposed to dimethyl sulphoxide (DMSO) and (b) in cells exposed to 1 µM ATRA for 24 h. The fraction of $K10^+$ cells was markedly decreased after exposure to ATRA. Scale bars denote 20 µm.

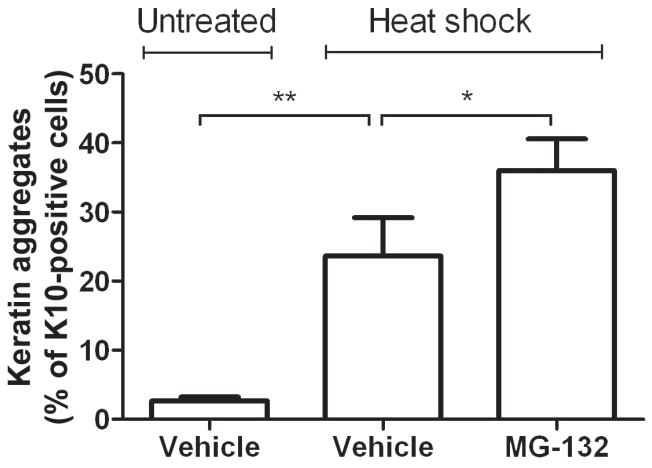

Fig. S2. Elimination of keratin aggregates is reduced by a proteasome inhibitor. To evaluate whether aggregated keratin is degraded through the proteasome-mediated degradation, differentiated epidermolytic ichthyosis (EI) cells were pre-incubated with 400 nM MG132 (a proteasome inhibitor) prior to heat stress. Treatment with MG132 increased keratin aggregate-containing cells to 35%, in comparison with 25% in vehicle-treated cells. Data are expressed as aggregate-containing cells/keratin 10+ cells (mean ± standard deviation, $n=3$), *$p<0.05$, **$p<0.01$ and ***$p<0.001$.

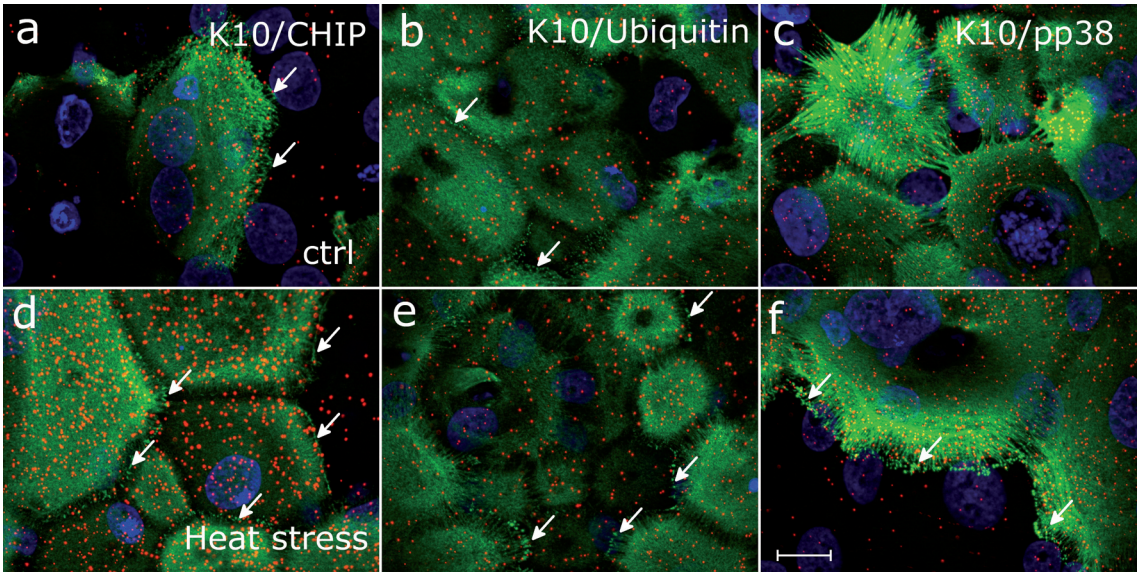

Fig. S3. Keratin 10 (K10) co-localizes with proteins involved in proteasome-mediated degradation but the co-localizations are not enriched in keratin aggregates. Epidermolytic ichthyosis (EI) keratinocytes were stained for co-localization of K10 with chaperone-dependent E3 ubiquitin ligase C terminus of Hsc70-interacting protein (CHIP) (a, d), ubiquitin (b, e) and p-p38 (c, f) by *in situ* proximity ligation assay (PLA) (*red*) before (a–c) and after (d–f) heat stress, followed by counterstaining with the K10 antibody to detect keratin filaments and aggregates (*green*). Keratin 10 co-localized with CHIP, ubiquitin and p-p38 in the cytoplasm in control and heat-stressed cells. However, K10 aggregates (*arrows*) were not detected in close proximity to the PLA signals, not even after heat stress.