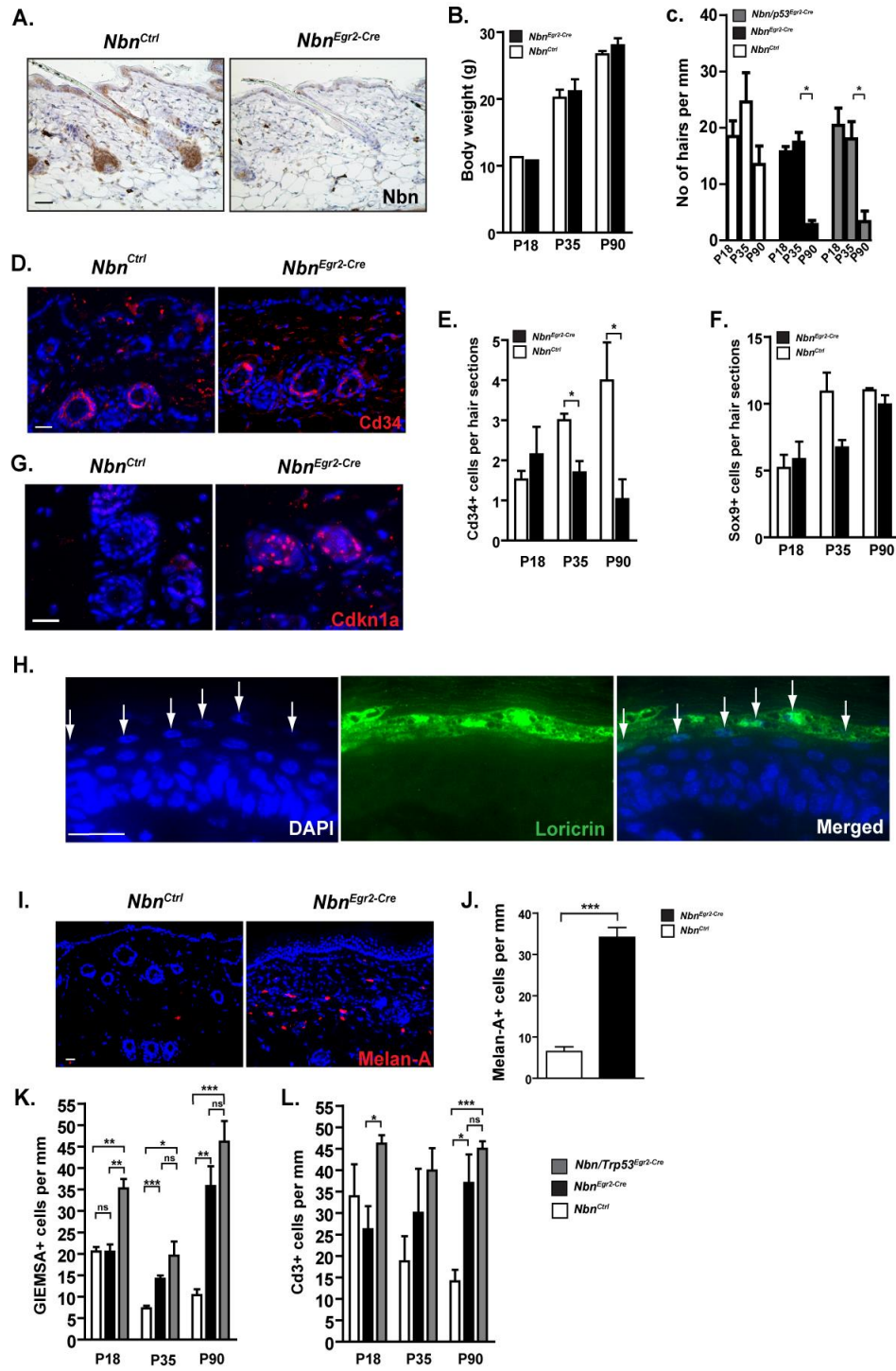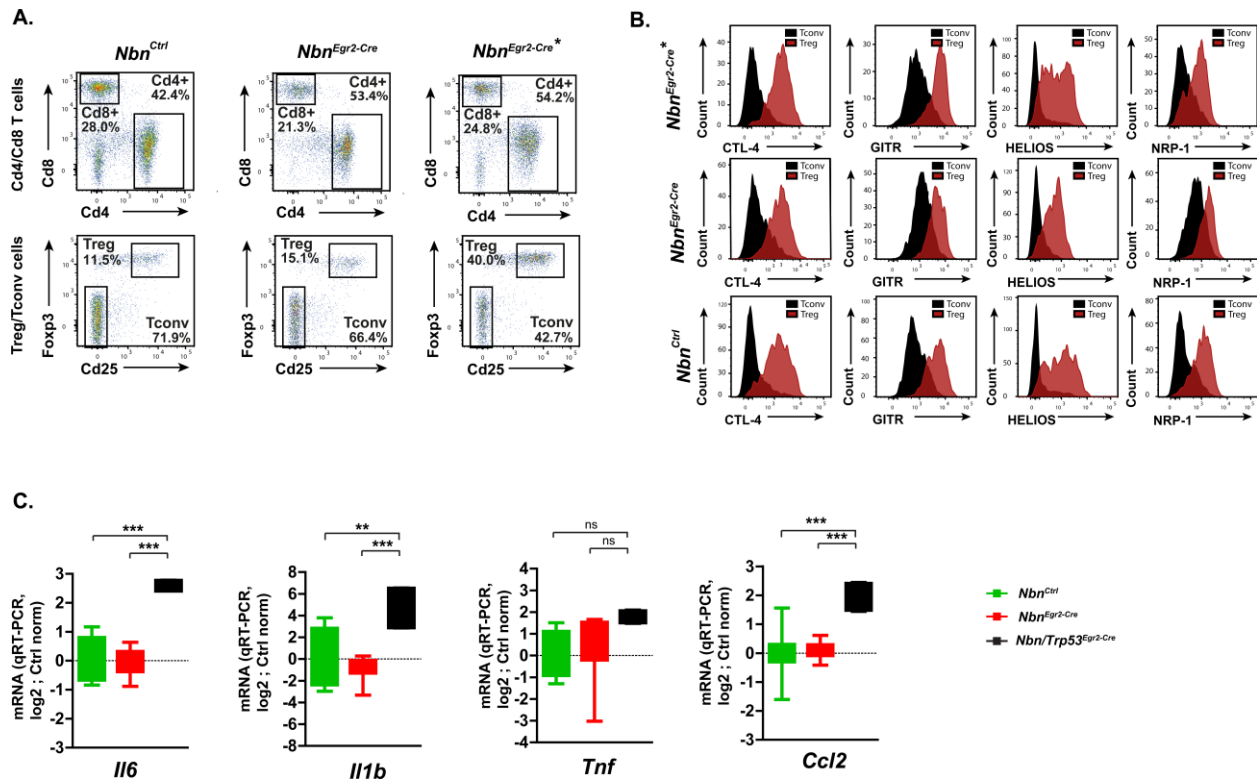# Epidermal *Nbn* deletion causes premature hair loss and a phenotype resembling psoriasiform dermatitis

Supplementary Material

Supplementary Figure 1: (**A**) Nbn Immunohistochemistry shows Nbn expression in HF bulk and keratinocytes at P18. Remarks the dramatic reduction of Nbn expression in *Nbn*$^{Egr2-Cre}$ skins. (**B**) Body weight of *Nbn*^{Ctrl} and *Nbn*$^{Egr2-Cre}$ mice at P18, P35 and P90. No obvious weight differences were observed. *Nbn*^{Ctrl}: P18 (N=1), P35 (N=5), P90 (N=3). *Nbn*$^{Egr2-Cre}$: P18 (N=1), P35 (N=2), P90 (N=5). (**C**) Quantification of HFs in P18, P35 and P90 *Nbn*$^{Egr2-Cre}$ skins. The HFs were count in section of skin and measure per skin length (mm). At P18, *Nbn*^{Ctrl} (N=9), *Nbn*$^{Egr2-Cre}$ (N=6), *Nbn/Trp53*$^{Egr2-Cre}$ (N=4); at P35 *Nbn*^{Ctrl} (N=7), *Nbn*$^{Egr2-Cre}$ (N=5), *Nbn/Trp53*$^{Egr2-Cre}$ (N=3); at P90 *Nbn*^{Ctrl} (N=6), *Nbn*$^{Egr2-Cre}$ (N=7), *Nbn/Trp53*$^{Egr2-Cre}$ (N=4). ***: p=0.0002. (**D**) Representative Cd34 immunostaining in P18 *Nbn*^{Ctrl} and *Nbn*$^{Egr2-Cre}$ skins. Scale bar 20 µm. (**E**) Quantification of Cd34+ cells in hair sections. A significant difference was observed between *Nbn*^{Ctrl} and *Nbn*$^{Egr2-Cre}$ HFs as early as P35. *Nbn*^{Ctrl} at P18 (N=2), at P35 (N=2), at P90 (N=3). *Nbn*$^{Egr2-Cre}$ at P18 (N=3), at P35 (N=2), at P90 (N=3). * p < 0.05. (**F**) Quantification of Sox9+ cells in hair sections. *Nbn*^{Ctrl} at P18 (N=2), at P35 (N=3), at P90 (N=3). *Nbn*$^{Egr2-Cre}$ at P18 (N=3), at P35 (N=3), at P90 (N=3). No significant difference was observed between *Nbn*^{Ctrl} and *Nbn*$^{Egr2-Cre}$ HFs. (**G**) Cdkn1a (p21$^{Cip1/Waf1}$) positive immunostaining in P18 *Nbn*$^{Egr2-Cre}$ HF sections. (**H**) Loricrin staining of P90 *Nbn*$^{Egr2-Cre}$ indicating the retention of nucleus in Loricrin-positive cells. Scale bar 20 µm. (**I**) Representative melanocytes immunostaining using Melan-A marker. Scale bar 20 µm. (**J**) Quantification of Melan-A positive (Melan-A+) cells per mm of skin length in *Nbn*^{Ctrl} (N=4) and *Nbn*$^{Egr2-Cre}$ (N=4). A significant increase of the number of melanocytes was observed in *Nbn*$^{Egr2-Cre}$ skins. *** : p<0.001. Quantification of GIEMSA+ (**K**) and Cd3+ (**L**) cells per surface skin mm in *Nbn*^{Ctrl}, *Nbn*$^{Egr2-Cre}$ and *Nbn/Trp53*$^{Egr2-Cre}$ skins. At P18, *Nbn*^{Ctrl} (N=3), *Nbn*$^{Egr2-Cre}$ (N=4), *Nbn/Trp53*$^{Egr2-Cre}$ (N=3); at P35 *Nbn*^{Ctrl} (N=4), *Nbn*$^{Egr2-Cre}$ (N=4), *Nbn/Trp53*$^{Egr2-Cre}$ (N=3); at P90 *Nbn*^{Ctrl} (N=5), *Nbn*$^{Egr2-Cre}$ (N=5), *Nbn/Trp53*$^{Egr2-Cre}$ (N=3). *: p<0.05, **: p<0.01, ***: p<0.001, ns: no significant.

Supplementary Figure 2: (**A**) Immunophenotyping of *Nbn^Egr2-Cre* mouse. Cd4 positive (Cd4+) and Cd8 positive (Cd8+), Foxp3 positive (Foxp3+; regulatory T cells) T cell population in 5 months old *Nbn^Ctrl* and *Nbn^Egr2-Cre* mice (* indicates that this mouse had a splenomegaly and severe lymphadenopathy). The number written below the indicated box are the percentage of the respective subpopulation of T cells. (**B**) Expression pattern of indicated marker are shown for regulatory T cells (Tregs; defined as Cd4+Foxp3+Cd25+) and conventional T cells (Tconv). (**C**) Persistence of inflammatory response indicated by *Il6*, *Il1b*, *Tnf*, *Ccl2* expression in *Nbn/Trp53^Egr2-Cre* at P90. *Nbn^Ctrl* (N=4), *Nbn^Egr2-Cre* (N=4), *Nbn/Trp53^Egr2-Cre* (N=2).