Supplementary Figure S1: (*A*) Schematic representation of the Jarid2$^{Flox/Flox}$ locus and the strategy used to visualize the wt and the Flox/Flox mRNA by PCR from cDNA. An example of the genotyping strategy is reported. (*B*) As a control of homogenous recombination throughout all keratin-14 positive cells in the epidermis, mice were kept in a ROSA26-YFP background. Scale bar: 100 μm. (*C*) RT-PCR showing deletion of Jarid2 in keratinocytes isolated from Jarid2cKO mice compared to control keratinocytes. Amplification of Keratin-14 was used as a control. Quantitative RT-qPCR with the same primers shows that the level of Jarid2 is undetectable in the conditional KO mice. Expression of HPRT-I was used for normalizing the data. Data are presented as mean + S.E.M. (*D*) Western-Blot showing the expression of Jarid2 in keratinocytes isolated from Jarid2wt and Jarid2cKO newborn mice. Total H3 was used for normalization.

Supplementary Figure S2: The expression of Jarid2 (mRNA) is the same in basal ($\alpha6^{bright}$) and suprabasal ($\alpha6^{dim}$) keratinocytes isolated from the epidermis of E16.5 and E18.5 embryos. CD31, CD140a and CD45 antibodies (Lin-) were used to exclude the non epidermal lineages from the preparation. One representative FACS-sorting is presented. Data are presented as mean + S.T.D.V. of the RT-qPCR. N=9 mice for E18.5, N=6 for E16.5 embryos.

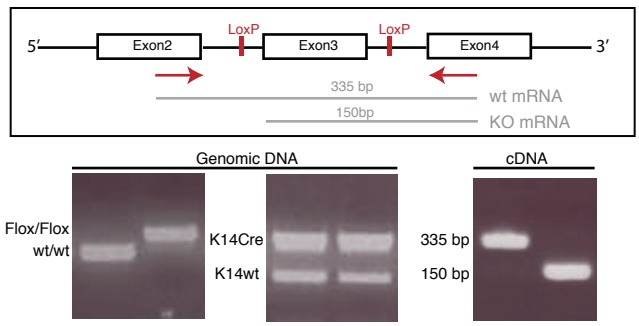
Supplementary Figure S3: Jarid2 mRNA levels were downregulated during differentiation in primary human keratinocytes (P*<0.05, P**<0.01). Primary human keratinocytes, isolated from foreskin, were sorted based on their surface levels of α6-integrin, and Jarid2 levels were assessed by RT-qPCR. Involucrin and α6-integrin levels were used as a control. Primers for HPRT-I were used for

normalization. The sorting strategy used for this experiment is reported on the left. N=4. Data are presented as average + S.E.M. P value<0,05.

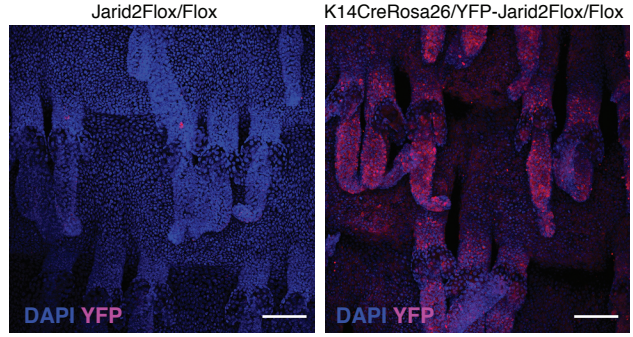
Supplementary Figure S4. Jarid2 is required for the ectopic activation of bulge stem cells and their progeny upon TPA treatment: (*A*) The response to TPA treatment was delayed in Jarid2cKO. The epidermis of TPA-treated Jarid2cKO animals displayed a thicker cornified layer than control littermates (left panel; scale bar: 100 mm). The middle panel shows an increased expression of the loricrin (red fluorescence) in TPA-treated Jarid2cKO mice compared to controls. Keratin-14 is marked as green fluorescence. Scale bar: 25 μm. Wholemount staining for Ki67 in TPA-treated tails reveals a reduction in the number of proliferative cells in the bulge and bulb. Scale bars: 100 μm and 25 μm, respectively. N=7.

Supplementary Figure S5: (*A*) Expression of Jarid2 (mRNA) is lower in differentiated keratinocytes than in basal progenitors isolated from the epidermis of P8 mice. Cells were FACS-sorted on the basis of bright and dim expression of the surface markers α6-integrin. Non-epidermal contaminants were excluded using Lineage- antibodies (CD31, CD45, CD140a). *(B)* The epidermis of Jarid2cKO P8 mice show increased expression of differentiation genes and p16. Data are presented as average + S.T.D.V. N=6 Jarid2 wt, 4 Jarid2 cKO.

S1A)



S1B)



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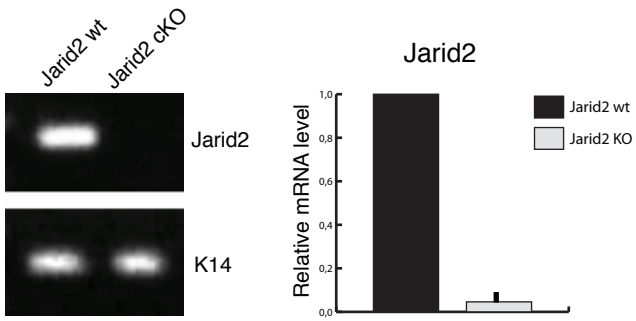
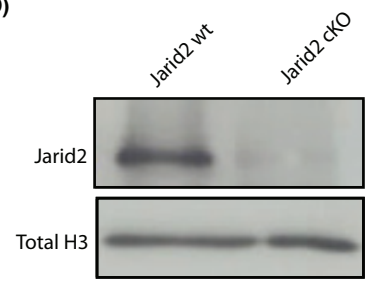
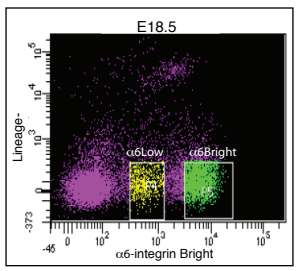
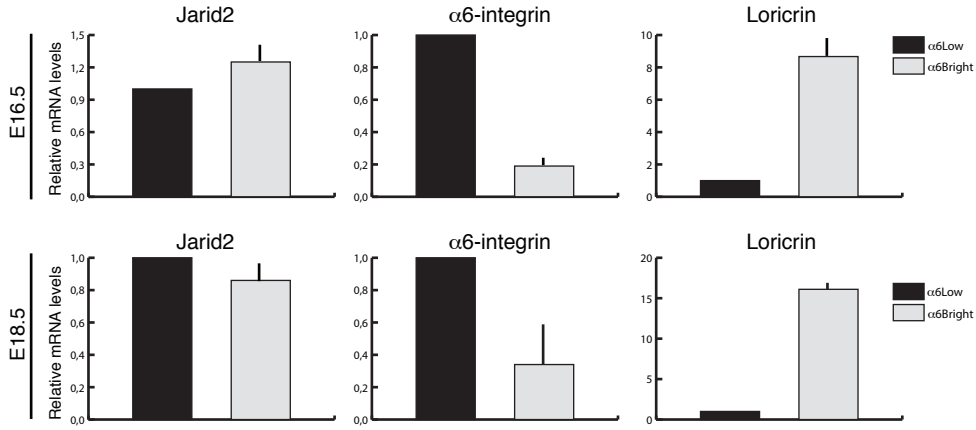
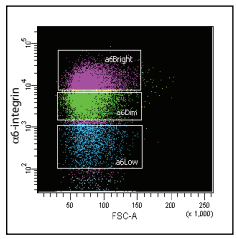


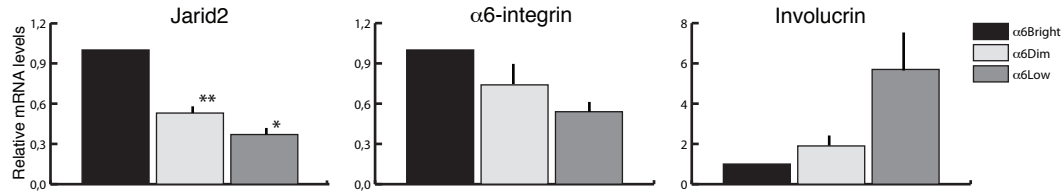
S1D)



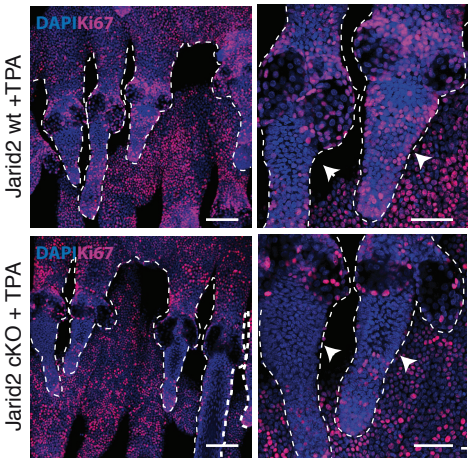

E18.5
Lineage-
α6Low
α6Bright
α6-integrin Bright


Jarid2
α6-integrin
Loricrin
E16.5
E18.5
Relative mRNA levels
α6Low
α6Bright

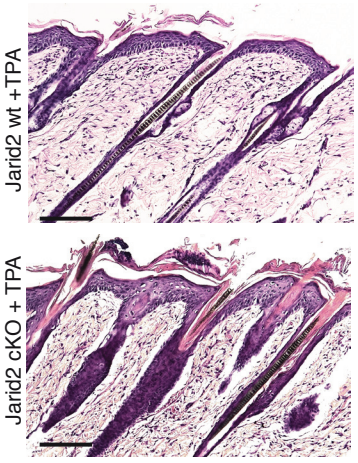

α6Bright
α6Dim
α6Low
α6-integrin
FSC-A
(x 1,000)


Jarid2
α6-integrin
Involucrin
Relative mRNA levels
1,2
0,9
0,6
0,3
0,0
8
6
4
2
0
**
*
α6Bright
α6Dim
α6Low

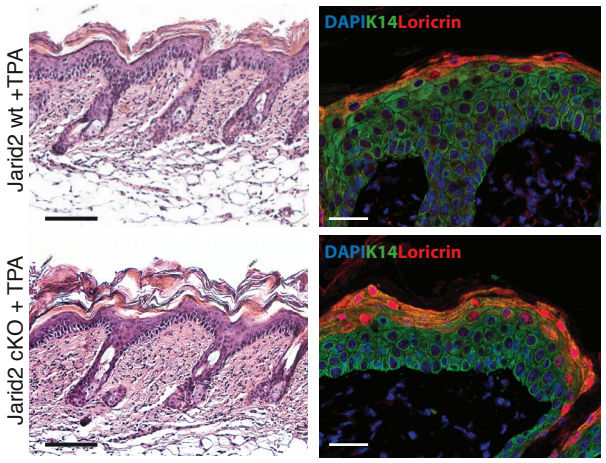
S4A)


DAPIKi67
Jarid2 wt +TPA
DAPIKi67
Jarid2 cKO + TPA

S4B)

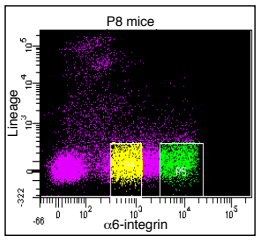

Jarid2 wt +TPA
Jarid2 cKO + TPA

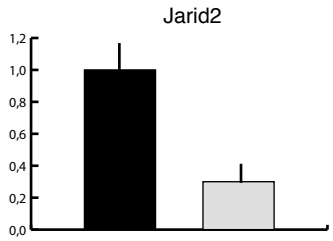
S4C)

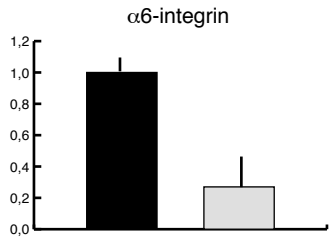

Jarid2 wt +TPA
DAPIK14Loricrin
Jarid2 cKO + TPA
DAPIK14Loricrin

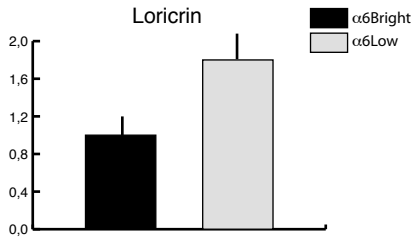
Mejetta_FigS5

S5A)









S5B)

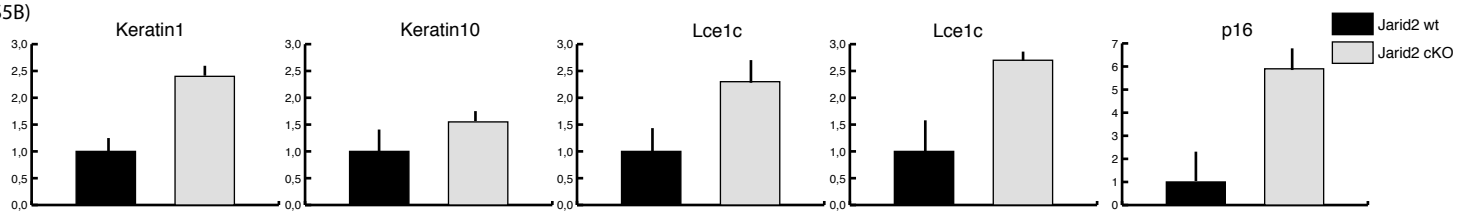


Table1		
Genotyping PCR	Fw Primer	Rev Primer
Jarid2 Flox	GCGGTAAATGGTGAGTTGAAA	ACAGACTGACACACCTTCC
K14 wt	CAAATGTTGCTTGCTTGTCTGGTG	GTCAGTCGAGTGCACAGTTT
Cre Tg	GTCCATGTCCTTCCTGAAGC	TTCCTCAGGAGTGTTCTTCGC

Table2		
Mouse qPCR	Fw Primer	Rev Primer
K14	AGCGGCAAGAGTGAGATTTCT	CCTCCAGGTTATTCTCCAGGG
K1	GACACCACAACCCGGACCCAAAACTTAG	ATACTGGGCCTTGACTTCCGAGATGATG
K10	GGAGGGTAAAATCAAGGAGTGGTA	TCAATCTGCAGCAGCACGTT
Loricrin	TCACTCATCTTCCCTGGTGCTT	GTCTTTCCACAACCCACAGGA
Involucrin	GTCCGGTTCTCCAATTCGTGTTT	GCAATTGGAAGAGAAGCAGCATCAG
Lce1a2	GAGGTGCCCAAGGATCTTGTAC	CCAGGCTACAGCAGGAAGACAC
Lce1c	AGATCTCAAACATTCTATGCAGAGGAA	TCACAAAATACTGAAGAAGAAAGGGATT
Lce1d	GACTGCTGCTGATCTCAATGAGAA	TGCAGAAACTTTCCCTGAAGATTTC
Lce1l	CATGAAGGCTTCAGACAAGCAAT	TTGGAATCACAGAAGGAGATGAGAC
Lce1m	AGCATTGACTGAAGACCTGCAA	GCAAAGCCAATGCATCTCAGA
Crct1	ACTGCACTTTGATGTTCAGAAACTTC	CAGGAGGCCTGTTTTGAACACT
Filaggrin	GGAGGCATGGTGGAACTGA	TGTTTATCTTTTCCCTCACTTCTACATC
a6-integrin	TGCAGAGGGCGAACAGAAC	GCACACGTCACCACTTTGC
CD34	AAGGCTGGGTGAAGACCCTTA	TGAATGGCCGTTTCTGGAAGT
Ki67	AGGAGGAACCAACCAAGGACAGTT	TTTCTCTGTGCTGTGGGCTCTTCT
Jarid2	GGTGCAGGTACAAACAGTGCCAAA	GTGGTGGTTGGGTTTGGTTTCCTT
Jmj 150-387	AGGCCTTGCCGGGAGCCTGAA	AGCAAAGGCTCCACTATCTTC
Pum1	AGGCGTTAGCATGGTGGAGTA	TCCATCAAACGTACCCTTGTTC
HPRT-I	TCAGTCAACGGGGGACATAAA	GGGGCTGTACTGCTTAACCAG
Human qPCR	Fw Primer	Rev Primer
a6-integrin	CTAGTGGCTATTCTCGCTGGG	CGTTCCACTTTGTGATCCACTG
Involucrin	GACTGCTGTAAAGGGACTGCC	CATTCCCAGTTGCTCATCTCTC
Filaggrin	GAGAGGCGATCTGAGTCTGC	CTGCCACGTGACTGTATTCC
Jarid2	GGTCAGAAGAACGGGTGGTA	TTACCAAGGAGCCCATTCAC
Pum1	CGGTCGTCCTGAGGATAAAA	CGTACGTGAGGCGTGAGTAA
HPRT-I	TGGACAGGACTGAACGTCTTG	CCAGCAGGTCAGCAAAGAATT

Table3		
CHIp qPCR	Fw Primer	Rev Primer
Olig2	TGCTTATTACAGACCGAGCCAAC	CTAAATCCTAGCCACTTTGGAGAAGT
Neurg1	CCGGGTCGTACGGACAGTAA	TCGGTGAGGAAGCTGCACA
Neurog2	CAGATCTGATTGTTTTCTTGGTGGTATA	GCGTGGTTGTCTGTCAGTCAGT
HoxB13	TCTGGAAAGCAGCGTTTGC	CTTAGTGATAAACTTGTTGGCTGCA
Actin-B	CCGTAAAGACCTCTATGCCAACAC	GCTAGGAGCCAGAGCAGTAATCTC
p16 Promoter	GATGGAGCCCGGACTACAGAA	CTGTTTCAACGCCCAGCTCTC
K14	AGGAGGGATCTGATCGGGAGT	AGAGCTGCTCAGGTGTGTTAGAAAA
K1	CTCAGTATATAAGGGCACGGCACT	GACTCATGATGCCTTAGAGAGAGGT

K10	AGCAAAGCCTAGCACCTGTGA	GCTGCTGGAGCTGTATAGAACAGAC
Loricrin	CAGAGCAGGACAAGAGTATAAAACACA	GCCCACACTTACCTGAAGCAC
Lce1a2	GAGGTGCCCAAGGATCTTGTAC	CCTTCCCCCAACACTTCCAT
Lce1i	TCCTGGAGGTAAGGGCAGAGA	CAAGGCTGTGGCTAGTTATTGTCA
Lce1m	AGCATTGACTGAAGACCTGCAA	GCAAAGCCAATGCATCTCAGA
Lce3b	AAAGCATCCTCAGACACGGACTT	CCTATTGCACTTATGTCTGGATTTCTGT
Crct1	TCTGCCTAGCAGGTGTCAAGTTC	GCTACATTCTGGCTGCATCCTACT
Filaggrin	TCCCTTTTACAGGTGCATACACAC	CCTCCTTATCACTGGTTGAGTATTGTT
Sprr2f	TCTTTGAAAGGCCATATACCTCAGC	GTTCTGGTGCCCTGAGAAACC
Sprr2h	TGGTTCCAAACTCTGAGCAAGTGTA	CCTGTATATCAAGAGAGGGCATCAGAT