

SUPPLEMENTAL METHOD

Barrier Function Assay

Opossums were bred and maintained at the University of Illinois, Urbana mouse facility.

All animal procedures were approved by the University of Illinois, Urbana's Animal Care and Use Committee. Dye penetration assays on opossums were performed as previously described in mice (1).

1. de Guzman Strong, C., Wertz, P.W., Wang, C., Yang, F., Meltzer, P.S., Andl, T., Millar, S.E., Ho, I.C., Pai, S.Y. and Segre, J.A. (2006) Lipid defect underlies selective skin barrier impairment of an epidermal-specific deletion of Gata-3. *J. Cell Biol.*, **175**, 661-670.

Supplementary Table 1

Position/Name on EDC	UCSC Coordinates		Size of CNE
	Beginning	End	
2	150,223,484	150,223,754	270
3	150,224,212	150,224,384	172
9	150,231,146	150,231,790	644
18	150,240,740	150,241,236	496
49	150,270,919	150,271,046	127
122	150,344,161	150,344,569	408
132	150,354,421	150,355,824	1,403
136	150,358,367	150,358,482	115
139	150,361,533	150,361,782	249
145	150,367,081	150,367,582	501
180	150,402,310	150,403,002	692
184	150,407,000	150,407,429	429
185	150,407,932	150,408,136	204
189	150,411,850	150,412,078	228
199	150,420,493	150,420,708	215
342	150,564,100	150,564,694	594
346	150,568,287	150,568,542	255
409	150,631,961	150,632,622	661
430	150,652,291	150,652,619	328
461	150,683,210	150,683,588	378
531	150,753,354	150,753,714	360
534	150,756,606	150,756,846	240
537	150,759,864	150,760,135	271
542	150,764,576	150,764,798	222
555	150,777,079	150,777,205	126
559	150,781,626	150,781,965	339
576	150,797,668	150,797,910	242
621	150,843,202	150,843,535	333
639	150,861,064	150,861,488	424
642	150,865,005	150,865,380	375
661	150,883,425	150,884,534	1,109
673	150,895,340	150,895,715	375
754	150,976,553	150,977,133	580
761	150,983,327	150,984,045	718
877	151,099,712	151,100,212	500
923	151,145,042	151,145,699	657
964	151,185,995	151,186,382	387
978	151,199,941	151,200,157	216

984	151,206,141	151,206,503	362
1040	151,262,915	151,263,751	836
1226	151,448,012	151,448,260	248
1229	151,451,465	151,451,896	431
1234	151,455,875	151,456,726	851
1235	151,457,138	151,457,680	542
1275	151,497,219	151,497,516	297
1403	151,625,619	151,625,748	129
1413	151,635,685	151,635,943	258
1416	151,638,137	151,638,457	320

Supplementary Table 1. UCSC coordinates (hg18:chr1) of Epidermal

Differentiation Complex Conserved Noncoding Elements defined by

MultiPipMaker. Position on EDC reflects distance (kb) away from the *S100A10* transcriptional start site.

Supplementary Table 2

PCR	Forward Primer	Reverse Primer
S100a10	CTGAGAGTGCTCATGGAACG	TCCCCTTCTGCTTCATGTTT
S100a11	CCACCGTCAGCCACAGTC	ATCTAGCTGCCCCGTCACAGT
Tchhl1	CACATTGCCCCACATTCC	CCCTCAAGGAGCTGTCTCAG
Rptn	CCTGCCTCTTCTGCTCATTC	CCGAAGGATGTCTCCAAACT
Horn	GCAAGCAACATCAGTCTCCA	CAGAATTTGGTGAAACTCTGTTACC
Flg	CTCCTTCAGCTGCATTCGAT	TGCCTGTAGTTGTCCTTCCA
Flg2	TGCGTCAGGCCTTATCCTAC	TCCTTCTCCAGCAGTTCTT
Crnn	AACAGAAACTTGTCCTCCTG	TGACGTCAGCAAACCTCATGTT
Gm 4858	CTCAAGCATTCCACTCTCTGG	CCCCCAAATTCAGTGTAATG
Lce1m	GCTGAGTGATCTACTCCAGTGC	GAGAGAGAATCGGGGCTTGT
Crc1	TTCTGCCTAGCAGGTGTCAA	AGCAAGAGGAGGAGGAGGAC
Lce3f	GCCTTCTTCTCCTACCTTTGC	CCAGAGCTTGTAGCACAGCA
Lce3c	TCTTCTCCTGCCTTTGCTGT	TGCTGATTCTCCAGACTGT
Lce3b	AGCATCCTCAGACACGGACT	TGTAGCACAGCAGGAAGAGG
Lce3a	AAGTCTCCTATCACCTTCCCATC	AGCTTGTAGCACAGCACGAA
Lce1l	AGTTTCAGGCCCTGCTTCTT	CCAGGCTACAGCAGGAAGAC
Kprp	GCTCAGGTCCCAATCCAGTA	CCTTGGTCTCCACAACCACT
Lce1i	CAGATCTTGTGCTACCCTTCA	AATGGGCATTGTCGTTTCAT
Lce1h	TCCATTCACTGGCTGACTGA	TCCTGCACCATTTGTTTGAA
Lce1g	CACTGGCTGAGATACCCACA	CCACTGCTACAGCATCCAGA
Lce1f	ATCCACGCCATTAACACTGA	CCAGGCTACAGCAGGAAGAC
Lce1e	CCACTCACTGGGTGAGATACC	AACCCAAGCTACAGCAGGAA
Lce1d	ACTTCTCCTGAGGCGTCCAC	CCAGGCTACAGCAGGAAGAC
Lce1c	ACTGGCTGAGAAACCCACAG	CCAGGCTACAGCAGGAAGAC
Lce1a2	GCCCAAGGATCTTGTACTGC	CCAGGCTACAGCAGGAAGAC
Lce1b	TCCTCCTGAAGTGGCTACAGA	CCAGGCTACAGCAGGAAGAC
Lce1a1	CTCACCTTCCGAGGTATCCA	AAGACACAGGGGGACACTTG
Smcp	TCTGCTGAAACATCCAGGAA	GGATTTGGGACAGCAAGGT
Ivl	GCCTTCTCCCTCCTGTGAGT	ATGTTTGGGAAAGCCCTTCT
Spr2b	TTCCTGGTACTCAAGCATTGG	CTTGGGTGGACACTTCTGCT
Prr9	TCCACATCCTTCATTGAATCTC	TTGGCTTAACTCCTGGCACT
Pglyrp3	TTGGCTTCTTGGCTCTCAGT	CAATGTCACACCAGCCTTTG
9130204L05Rik	ACACTCTGGGTGGCTCTTCTC	TTGGAAATTCATTCTCACCAA
Pglyrp4	ATGCTGTCTGGCTTCTTGT	TCAGCTTAGAGCTGCAACCA
S100a9	GAAGGAAGGACACCCTGACA	TCAACTTTGCCATCAGCATC
S100a8	CTGAGTGTCTCAGTTTGTGC	GACCTGAGATATGATGACTTTATTCTG
S100a7a	GGATAGTGTGCCTCGTTCA	AGACTGCCTGTCTCCCTCT
S100a6	ATCCCCTCGACCACTCCTT	AGATCATCCATCAGCCTTGC
S100a5	GAGAAGGCACTGACCACCAT	CAATCTCCTGGTTCGCTGTTT
S100a4	CCCAAACCTCTCTATTAGCA	CTTTTCCCCAGGAAGCTAGG
S100a3b	AGCGTCTCCCTAGGTGCTG	GTCACACTCCCGAACTCAC
S100a3a	AGGGACACCCAGTTGGTAGG	GCAGCTCCTTCTGCAACAAC
S100a16b	GTGTCCAGAGGCCAGAGT	CGTCAGCATGTGGTTCAACT
S100a16a	GAGGAGGTGGACTCACAGGA	TCCAGGTTCTGGATGAGCTT
S100a14	GGCAGGCTATAGGACAGACG	CCTCAGCTCCGAGTAACAGG

S100a13	CCTTGCCTGGTGCTTATAAACTT	CCCTGCAAAGGTGAAGAAAG
S100a1	CAGTGGCCACATTTGCAG	TTCAGTTCTTTCTTGCTCAGCTT
B ₂ m	TGGTGCTTGTCTCACTGACC	CCGTTCTTCAGCATTTGGAT

Supplementary Table 2. Real-time Primers for Mouse Epidermal Differentiation

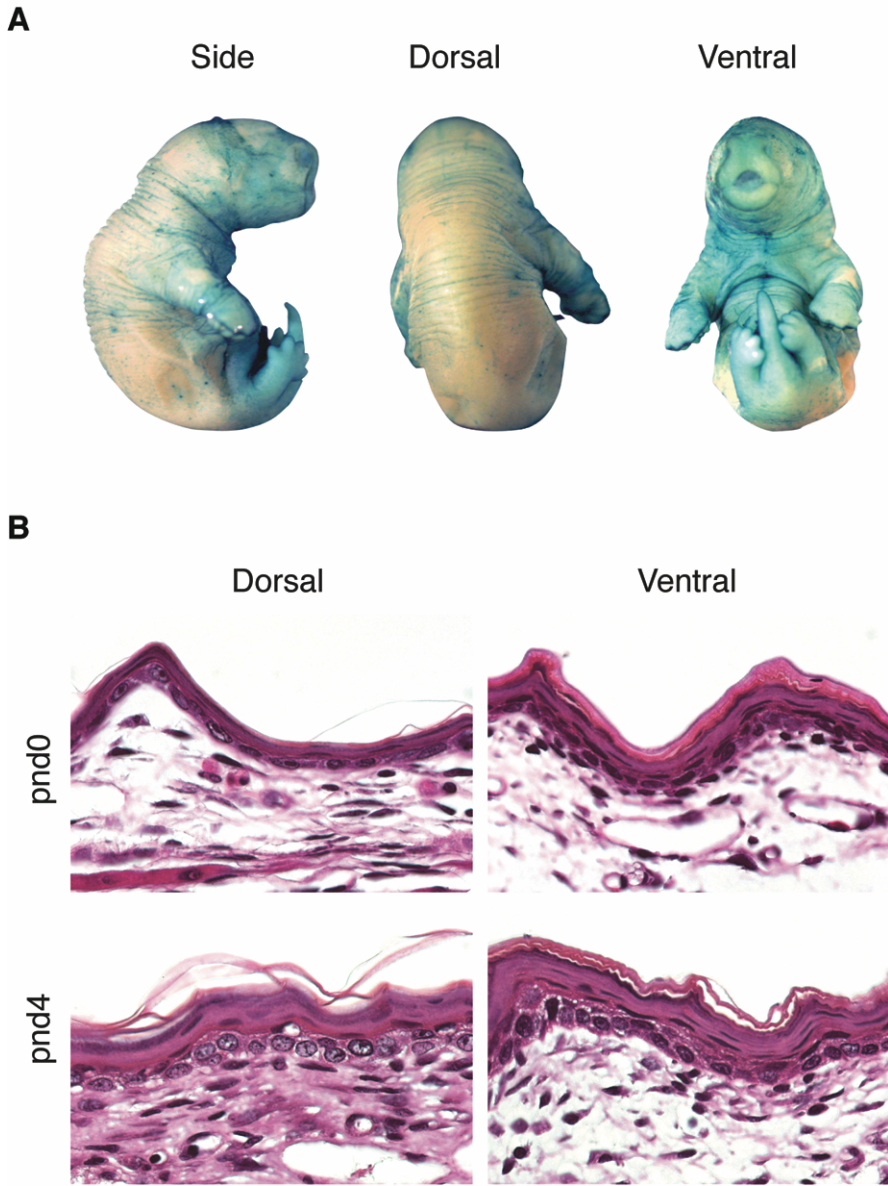
Complex genes.

Supplementary Table 3

DNase Region	Forward	Reverse
neg	CTTCTTGCATCTGTGGTGGA	ACCCTGCTGCCATATTGTGT
h923-1	GGCATGGCTATTCAAGATGAG	CTAAGGATGCACTGGCTATTTC
h923-2	GCTCAAATAGGTTGCCTCACTC	GGGAGAGGTTCTTTCCTGC
h923-3	GGTGGGGGTTGGACAGTTA	AAAGCTAGGGTGTGGGAAAGA
h923-4	CCCTAGAATGTTGAGGTTTCC	AGTCAGTCTGGGGCAGCA
h923-5	GATACTGAGCCCCTGCTAACC	CAGTGCTATCCCCTCCTCAT
h923-6	CCCAGAAAATGGCACAGT	CTGATTCCCATAGTTTTCTG
h621-1	GAGTCATTGATGCTTTCTGAGATT	CAGCTGCCAGTGGGTAAACT
h621-2	CACAGGTGCTATCTCTCCAC	ATGAGGGACACCAGGGAGAC

Supplementary Table 3. Tiling Primers for DNaseI Regions.

Supplementary Figure 1



Supplementary Figure 1. Patterning of epidermal barrier formation is conserved to the metatherian opossum. (A) Dye exclusion assay of newborn opossum demonstrates patterning of epidermal barrier formation (dorsal to ventral migration). **(B)** Histology (dorsal and ventral) of the opossum at postnatal day (pnd) 0 (newborn) and pnd4, 40X magnification.