

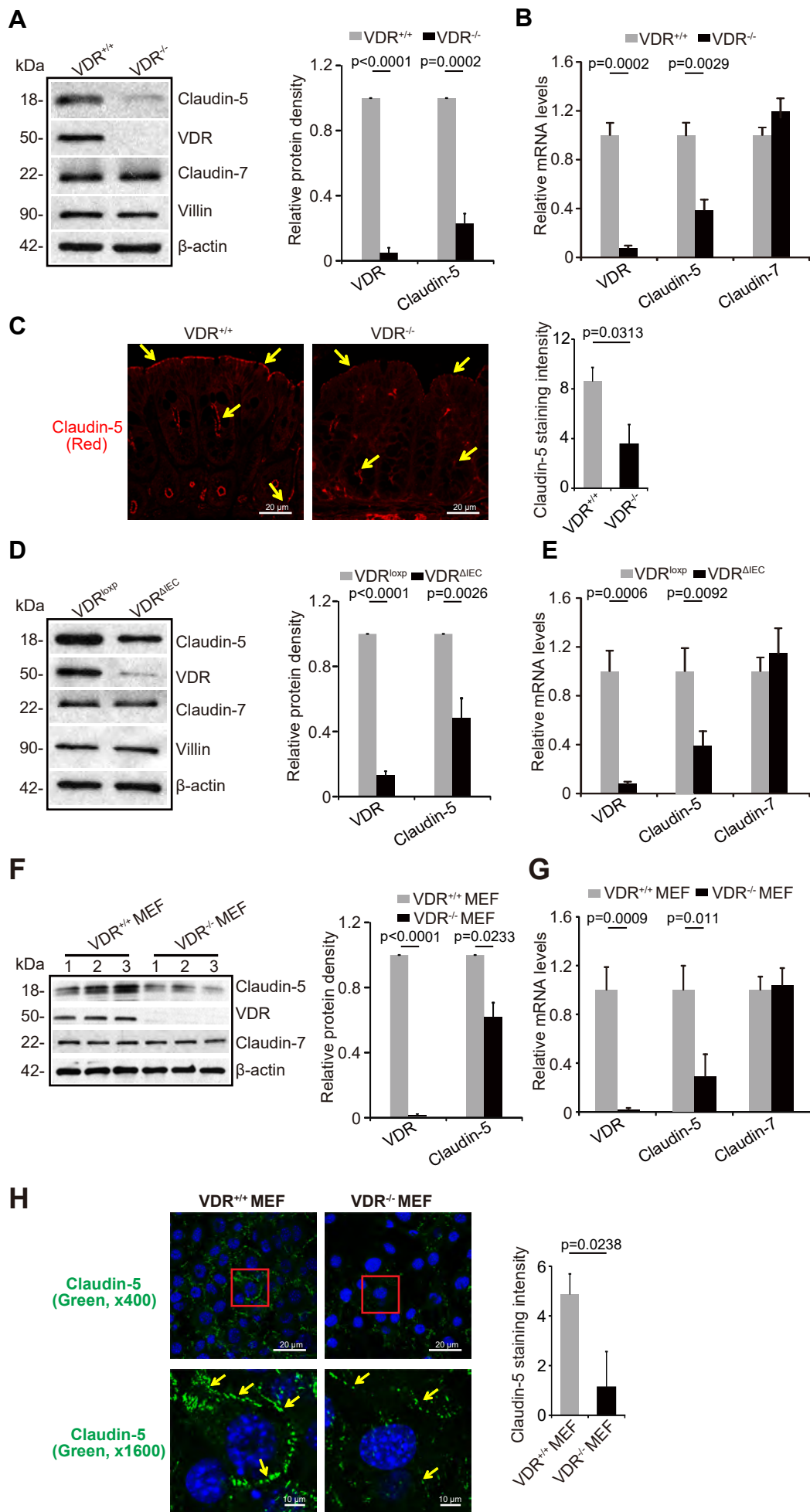
**Fig S1. VDR deficiency in intestinal epithelial cells of mice leads to the reduction of Claudin-5 at both the mRNA and protein levels *in vivo*.**

(A) Claudin-5 protein and (B) mRNA levels were significantly lower in VDR<sup>-/-</sup> mice compared to levels in the VDR<sup>+/+</sup> mice (data are expressed as mean ± SD. n = 3, Student's *t*-test). (C) Location of Claudin-5 protein in the colons of VDR<sup>+/+</sup> and VDR<sup>-/-</sup> mice. Images are from a single experiment and are representative of 5 mice per group (data are expressed as mean ± SD. n = 5, Student's *t*-test). (D) Claudin-5 protein and (E) mRNA levels were significantly lower in VDR<sup>ΔIEC</sup> mice compared to the levels in the VDR<sup>loxP</sup> mice (data are expressed as mean ± SD. n = 3, Student's *t*-test). (F) Claudin-5 protein and (G) mRNA were both decreased in VDR<sup>-/-</sup> MEF cells (data are expressed as mean ± SD. n = 3, Student's *t*-test). (H) Location and quantification of Claudin-5 protein in VDR<sup>+/+</sup> and VDR<sup>-/-</sup> MEF cells. Images are from a single experiment performed in triplicate. (Data are expressed as mean ± SD. n = 3, Student's *t*-test.). Actual p-values are shown in Figure S1.

**Fig S2. The DNA sequence for WT Claudin-5 promoter and deletion mutants.**

**Fig S3. The expression of Claudins in normal and colon cancer patients.**

(A) Claudin-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, -12, -14, -15, -16, -17, -18, -19, -20, -23 in normal and colon cancer patients (GEO database GSE8671). The expression of Claudin-1, -2, -12, -19 were increased in colon cancer patients; The expression of Claudin-5, -8, -15, -17, -20, -23 were decreased in patients with colon cancer; The expression of Claudin-3, -4, -6, -7, -9, -10, -11, -14, -16, -18 did not show distinct changes in patients with colon cancer and normal (data were expressed as mean ± SD; Normal, n = 32; colon cancer, n = 32; Welch's *t*-test).



## A

ATATGATAGCTGGAAGAGGTACCAGGGAGGACAAGAAAGGGTGTGTATGTGAGGCTCT  
CCCGCCGTC TTCTAAGAACAGTTTGTG TAGGGTGAAGTAGGCAATGACCTGGCCCAT  
AGACCTCTAGCTCAGAGCCATCTCCAGAAGGAAG **CAGGGACCCATAAAGG** GAGAGA

**D2 (Negative control)**

TTTACCAAATCTCCACATCTGTGGCTGGCC TCAACAATGTCATCCTTTCCCTATAGAGG  
CCCTGAGTTCTTTTGAGCAGAGGAAACAACAAAACAAAACCCCAACAGAACAAACA  
ACAGAAGACAACAAAGCCCAGCTGGAGTCCAGGGTTAGCTGGAAACAAAGGGAGCA  
GGGAGGAGTGTCACTGGAAAGAGGCTGGCGCCCT **AGTTTGGTTGTGGGCT** GTGGGG

**D1 (Claudin-5 VDRE deletion)**

CCTGGTGCCCCACCTGAGCCTCAGGGACCCAGTGTGCTAACCAGTGGACCTTTCA  
AGAAATGGCTGGGCCATTGTGCAGAAGAATGCCGGAATCCCGCGGC TCCCTCCTCC  
ACCGAGGATGGGGCTCTTCTCC TGCCAGGAACTCCAAGTTGGCTTCCGGAGGG  
TGCCCTGGGGGCTGGGGTGGCAA **AGCACCACAAC TATTG** TAGGATGGCAAGGCATAG

**D3 (Negative control)**

CCTTCTATGTCCCATCGTGTCTGTCTGCCAGGATTCCAGTATGCTGTGTTAGGATC  
ACAGCCTATCTGCTGGAGAAGACTGGACGTCGGAGAACCC TACGGGTTGCGCAGCA  
TCCCAGAGGAGAGCACAGGCCCTTGCAGTGTTCAC TTTGTGTCAGACCAGTGGTTCCA  
GGGAAGGAGTGAGAACTGTAGGCGGTGGTTGGGTAGGATCATGAATGAGGTT

**A**