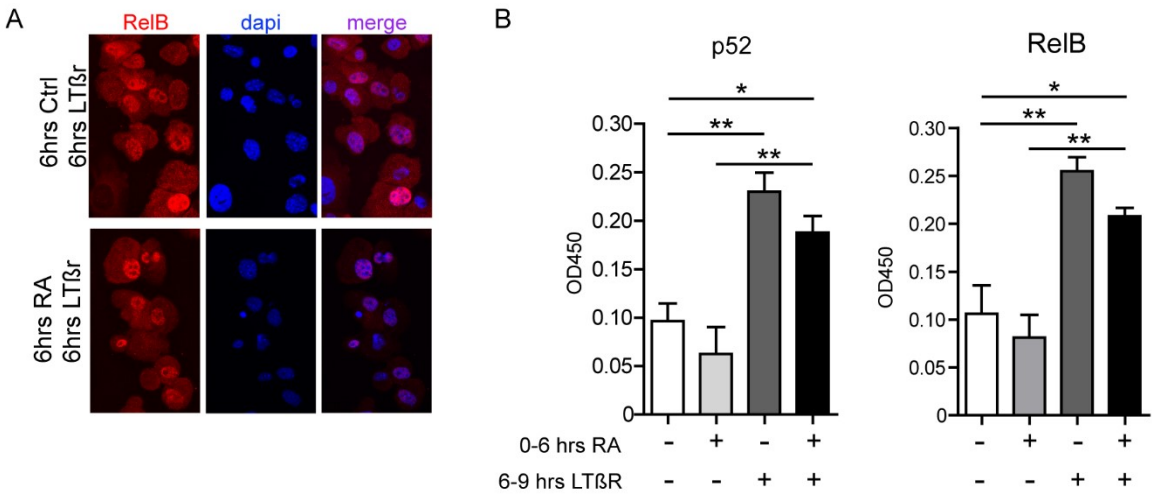

Fig. S1. Related to Figure 1. ***Retinoic Acid signaling prevents upregulation of FRC related genes***

(A) Immunofluorescence staining for RelB (in red) and nuclei (in blue) in cytospins of mesenchymal precursors stimulated with or without retinoic acid (6hrs) followed by agonistic anti-LTβR mAb (6hrs). B) TransAM analysis of nuclear p52 and relB after stimulation of mesenchymal precursors with retinoic acid (6hrs) followed by agonistic anti-LTβR mAb (3hrs) or retinoic acid (6hrs) alone or anti-LTβR mAb (3hrs) alone. Results are representative of 3 independent experiments. The data represent mean ± SEM; n = 3, * $p < 0.05$, ** $p < 0.01$, one-way ANOVA with Bonferroni's multiple comparison test.

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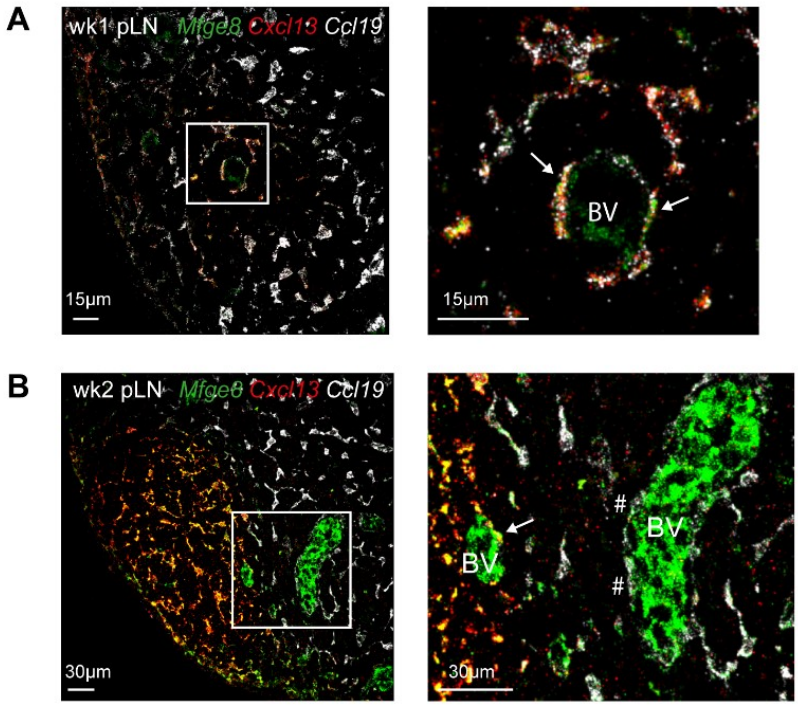

Fig. S2. Related to Figure 2 *Localization of FDC precursors*

A-B) Confocal analysis of peripheral lymph nodes (pLN).by multiple fluorescence *in situ* hybridizations at different timepoints after birth A) Combined expression of *Mfge8*, *Cxcl13* and *Ccl19* in peripheral lymph nodes at 1 week after birth. Arrows indicate cells around blood vessel (BV) expressing *Mfge8*, *Cxcl13* and *Ccl19*. B) Combined expression of *Mfge8*, *Cxcl13* and *Ccl19* in lymph nodes at 2 weeks after birth. Arrows indicate cells around blood vessel (BV) that express *Mfge8* and *Cxcl13*, hashtags indicate cells around blood vessel (BV) that express *Mfge8* and *Ccl19*. The data represent n = 3.

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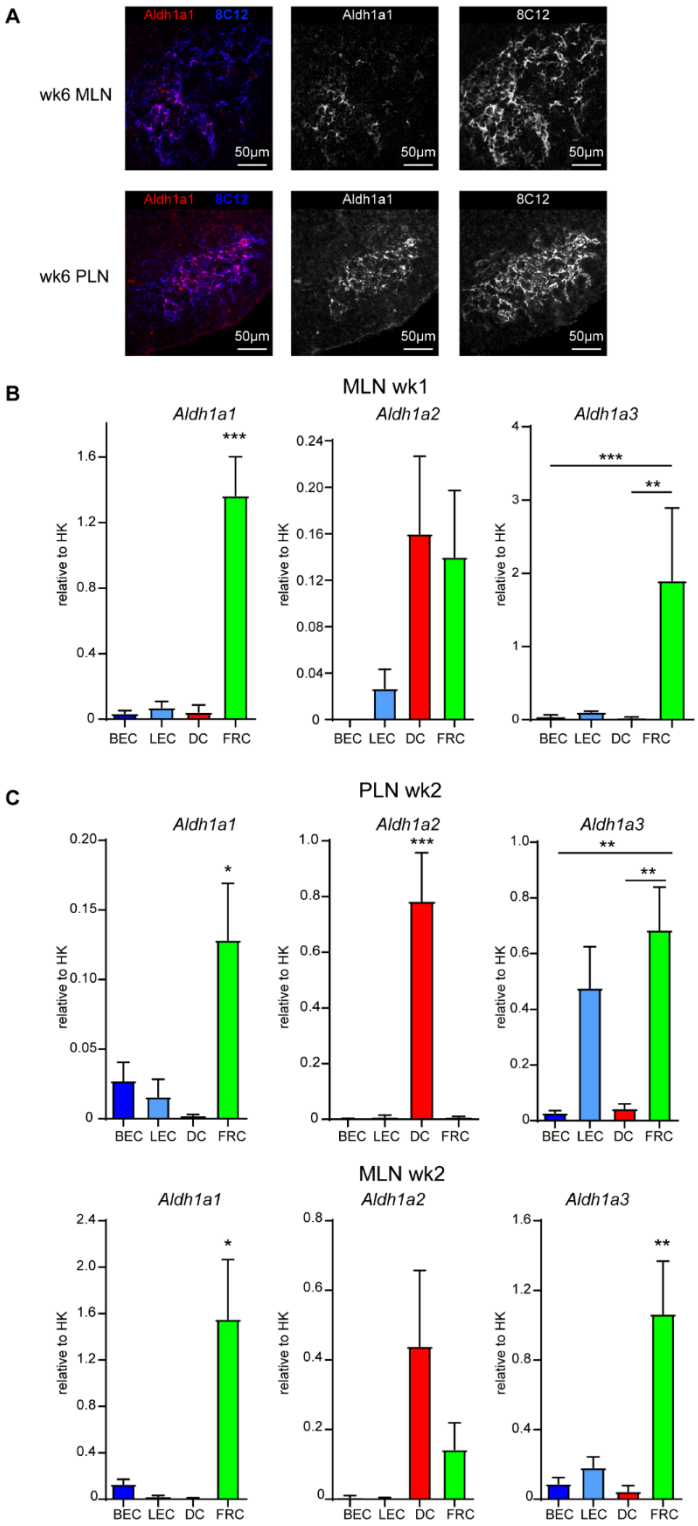

Fig. S3. Related to figure 3 *Multiple cellular sources of Aldh1 enzymes*

mRNA expression levels of *Aldh1a1-3* enzymes relative to housekeeping genes in sorted stromal cells and dendritic cells of peripheral lymph nodes (pLN) or mesenteric lymph nodes (mLN) at the indicated timepoints. The data represent mean ± SEM; n = 3.

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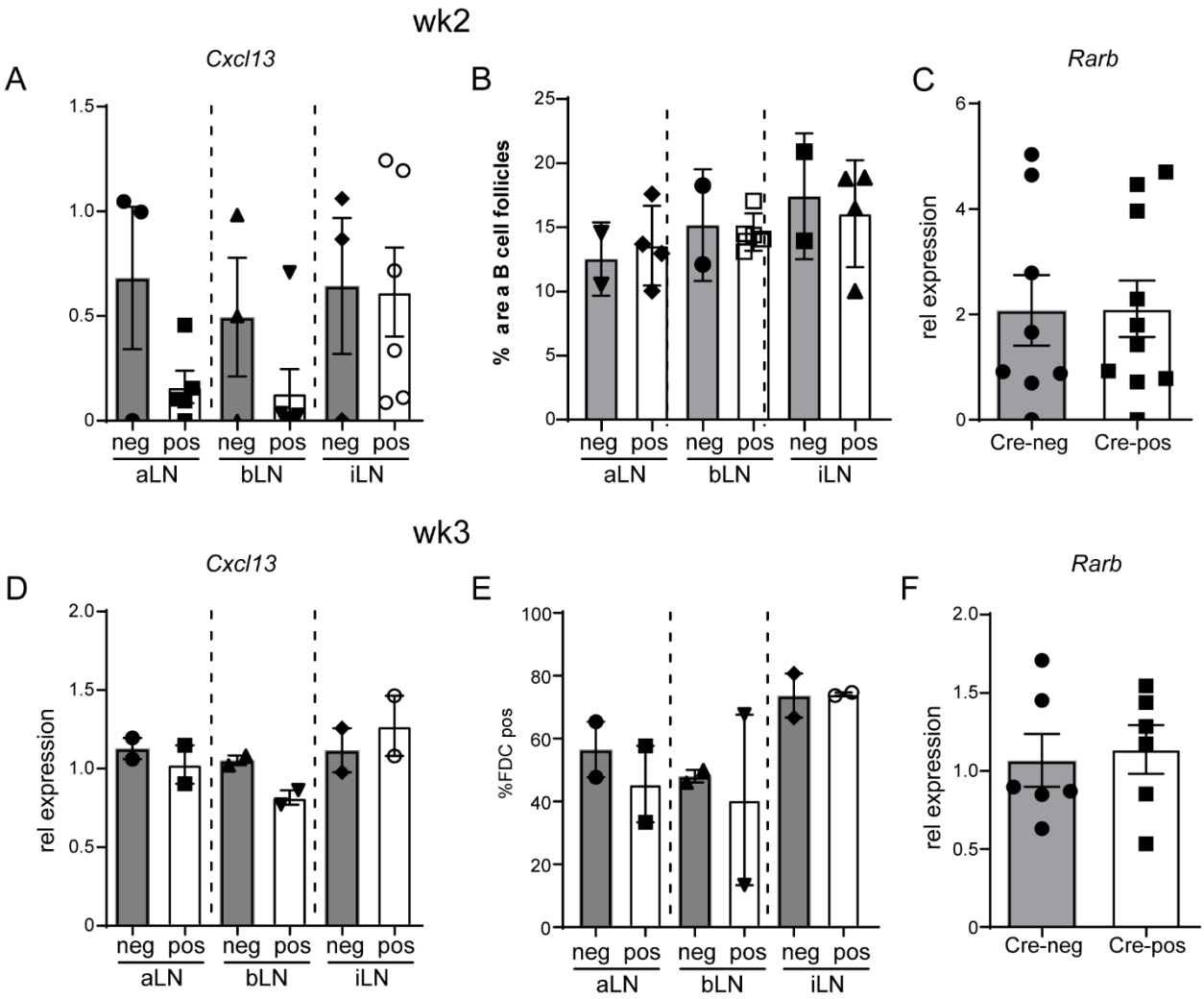

Fig. S4. Related to figure 4. ***RAR signaling blockade in nestin precursors does not prevent FDC formation.***

A and D) Relative *Cxcl13* mRNA expression in indicated peripheral lymph nodes (pLN) of in 2-week-old (A) and in 3-week-old (D) Nes-Cre^{ERT2pos} x DN-RAR mice compared to Nes-Cre^{ERT2neg} x DN-RAR littermates. B) Quantification of B-cell areas in 2-week-old Nes-Cre^{ERT2pos} x DN-RAR mice compared to Nes-Cre^{ERT2neg} x DN-RAR littermates. C and F) Relative *Rarb* mRNA expression in pLNs of 2-week-old (C) and 3-week-old (E) Nes-Crepos×RarDN mice compared with Nes-Creneg×RarDN littermates. E) Quantification of %FDC pos B-cell follicles in 3-week-old Nes-Cre^{ERT2pos} x DN-RAR mice compared to Nes-Cre^{ERT2neg} x DN-RAR littermates. The data represent mean ± SEM; n = 2 or more.

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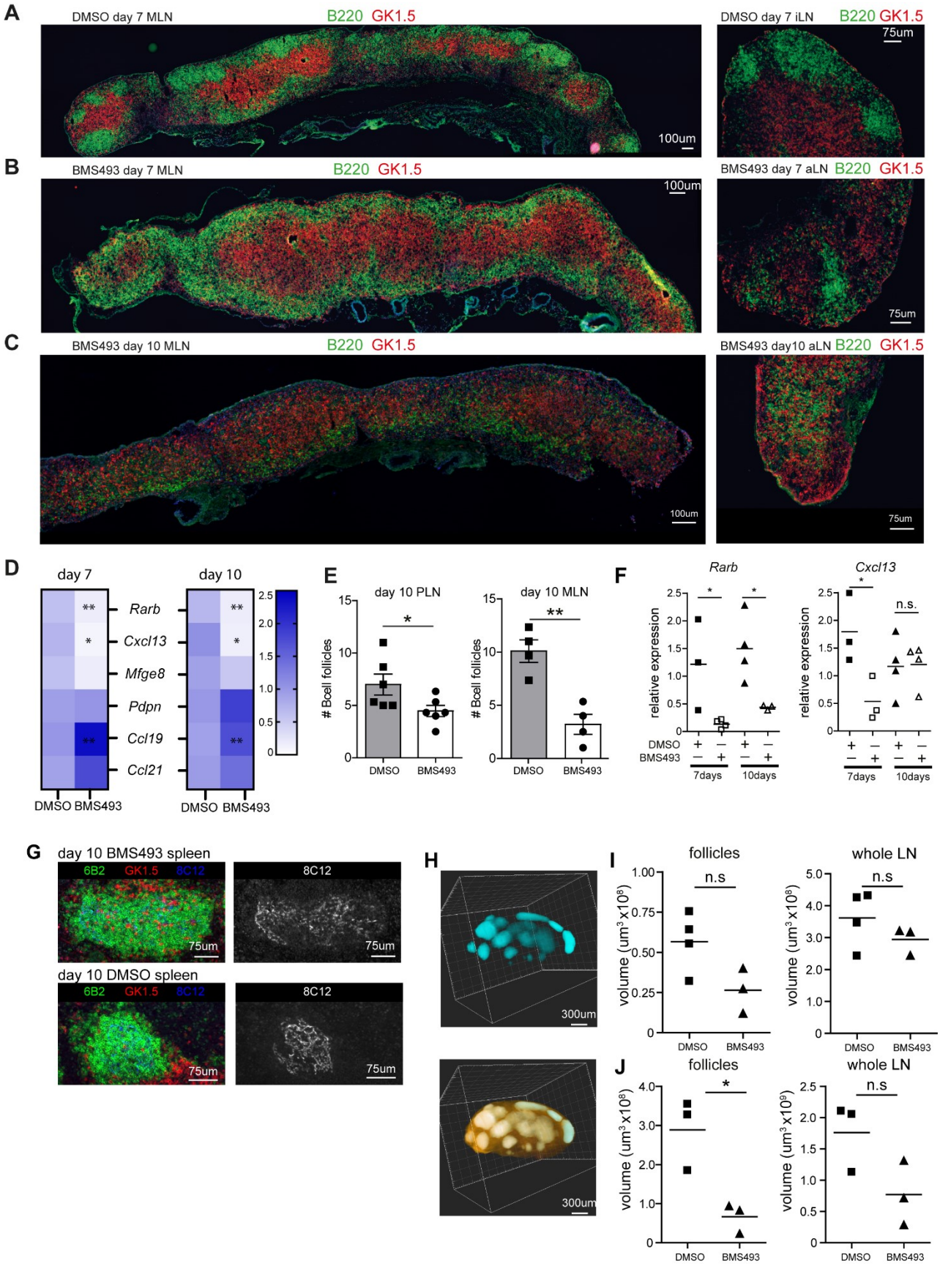

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Fig. S5. Related to Figure 5. ***Inhibiting retinoic acid receptor signaling prevents CXCL13 expression and development of FDCs in lymph nodes*** A-C) Immunofluorescence staining for B cells (green) and T cells (red) in peripheral and mesenteric lymph nodes of vehicle treated (DMSO) and BMS493 treated animals. D) Heatmap showing mRNA expression levels of listed genes in mesenteric lymph nodes upon treatment for 7 and 10 days with BMS493, starting at day 4 after birth. E) Quantification of the number of B cell follicles in DMSO and BMS493 treated animals in both peripheral and mesenteric lymph nodes. F) mRNA expression levels of *Rarb* and *Cxcl13* in spleen upon treatment with vehicle (DMSO) or BMS493 for 7 and 10 days starting at day 4 after birth. G) Immunofluorescence analysis of FDC (8C12 in blue) network in spleen of vehicle (DMSO) or BMS493 treated animals 10 days after treatment. H) Representative ultramicroscopy image of a whole mount stained peripheral lymph node from DMSO treated mice showing B cell follicles in blue and total lymph node volume in orange. I-J) Volume of B cell follicles and whole lymph nodes of peripheral lymph nodes of mice that were treated with suboptimal dose of BMS493 vs DMSO for 14 days starting at day 4 after birth (I) or for 7 days with BMS493 vs DMSO and left untreated for 21 days (J). Results are representative of at least 3 individual mice. The data in D, E, F, I-J represent mean ± SEM; n = 3. n.s. not significant. *, $p < 0.05$; ** $p < 0.01$, unpaired student's *t* test.

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Table S1. Primer sequences

Sequence	Name
ATATGGGTTTCATGGGCTTG	Mfge8 fw
GAGGCTGTAAGCCACCTTGA	Mfge8 rev
CCAGTTCCCAGACGTTGATT	Clusterin fw
AGCAGGGATGAGGTGTGGAG	Clusterin rev
CGAGTCTAAGCGGGAGACAG	Igfbp3 fw
TTGTTGGCAGTCTTTTGTGC	Igfbp3 rev
ATGCGAAGACTGCTGCC	CCL19 fw
AGCGGAAGGCTTTCACGAT	CCL19 rev
GCTGCAAGAGAACTGAACAGA CA	CCL21 fw
CGTGAACCACCCAGCTTGA	CCL21 rev
CACCCTGGTTGGAATCATAGTTG	GP38 fw
TAGGGCGAGACCTTCCAGAAA	GP38 rev
CATAGATCGGATTCAAGTTACGCC	CXCL13 fw
TCTTGGTCCAGACACAACTTCA	CXCL13 rev
GCCTGCAGAAGTGCTTTGAAGT	RAR-β fw
GCTCTCTGTGCATTCCTGCTTT	RAR-β rev
ATC GTG CTG CTC GCA AGT T	IL-7 fw
CAC CAG TGT TTG TGT GCC TTG T	IL7 rev
CCT ATA ATG AAC ACT GGA ACC ATC TCT	LTβR fw
TCC GAT CGC TGG TGC AA	LTβR rev
GGT TAC CTC AGC AAG ACG TTG TTT	VEGF-C fw
ATG CAC CGG CAG GAA GTG	VEGF-C rev
CTG GTG CTG ACC CAT AGA AAG	MAdCAM-1 fw
GGC TCA GCA GAG GTC GTG TT	MAdCAM-1 rev
CTC CTC TCA CGG CTC TTC A	RALDH1 fw
AAT GTT TAC CAC GCC AGG AG	RALDH1 rev
TCA TCA AAA CCC TGA GGT ATT ATG C	RALDH2 fw
GGGCTCGTGTCTTGTGAAAGTAA	RALDH2 rev
GTG TGC TTC ACC AGG CAT GA	RALDH3 fw
CAC AGG GCA GGA GCC AGT T	RALDH3 rev

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