

Figure S1: Morphology of NOTO-2A-mCherry-hiPSCs at day 5 of notochordal differentiation. Representative brightfield and fluorescent images of NOTO-2A-mCherry-hiPSC clone 10.1 at day 5 after treatment with LAF for 3 days and addition of CHIR99021 at day 3. Colonies show a compact area in the center (blue dotted circles), surrounded by loose cells at the edges. Images were taken at 10X magnification; Scale bar = 1000μm.

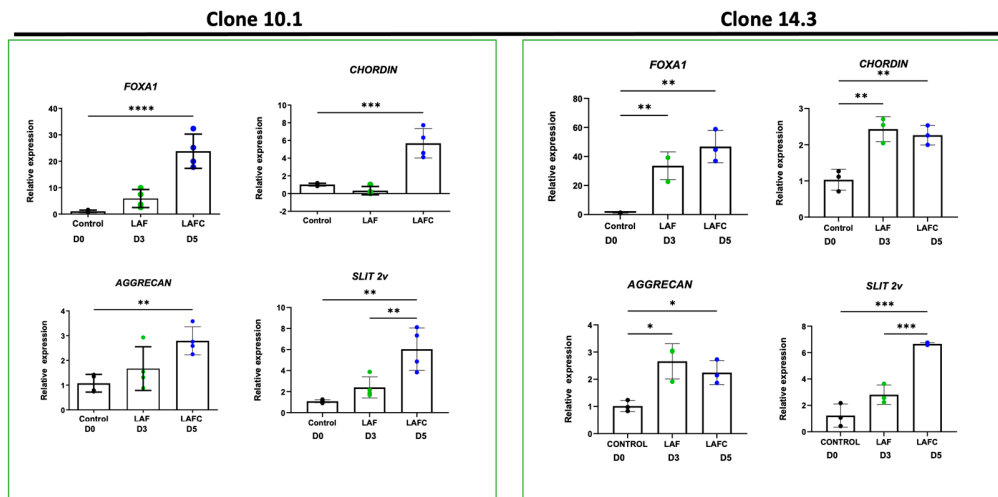


Figure S2: Embryonic notochordal cell marker expression during notochordal differentiation from human iPSCs (clone #10.1, 14.3). RT-qPCR analyses showed induced expression of *FOXA1*, *CHORDIN*, *SLIT2*, and *ACAN* in LAF and LAFc treatments of hiPSCs at day 3 (D3) and day 5 (D5) of notochordal differentiation. *GAPDH* gene served as internal control and data is represented as expression relative to undifferentiated hiPSC at day 0 (D0). All data are from three independent experiments and represented as mean±SD. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$; **** $p \leq 0.0001$

a			b		
Comparison	Coefficient (r)	P-value	Comparison	Coefficient (r)	P-value
KDM4A vs NOTO	-0.803	0.009	KDM4C vs NOTO	-0.697	0.037
KDM4A vs SHH	-0.892	0.001	KDM4C vs SHH	-0.832	0.005
KDM4A vs FOXA2	-0.891	0.001	KDM4C vs FOXA2	-0.939	0.0002
KDM4A vs T	-0.865	0.003	KDM4C vs T	-0.814	0.008

Figure S3: Negative correlation between *KDM4A* and *KDM4C* with notochordal marker genes. Linear regression analysis using Pearson correlation showing negative correlation of *KDM4A* (a) and *KDM4C* (b) with the expression of notochordal marker genes *SHH*, *NOTO*, *FOXA2*, and *T* based on RPKM values.