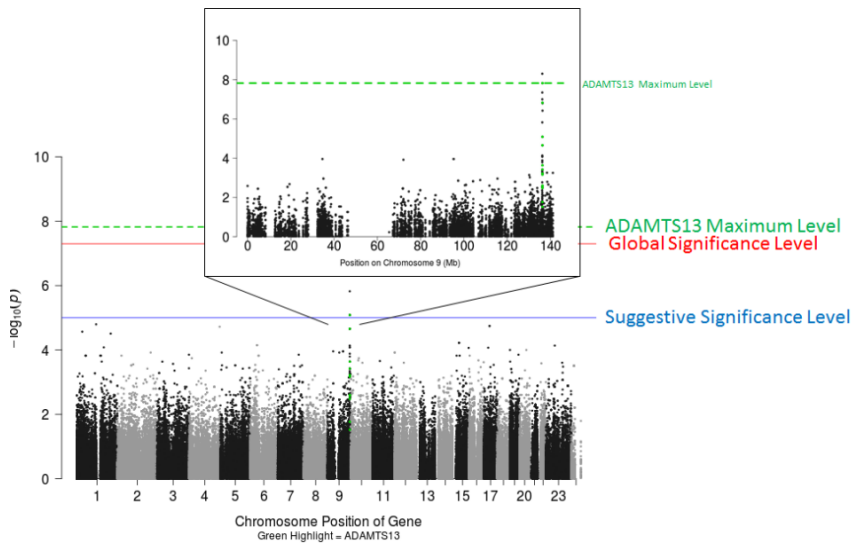
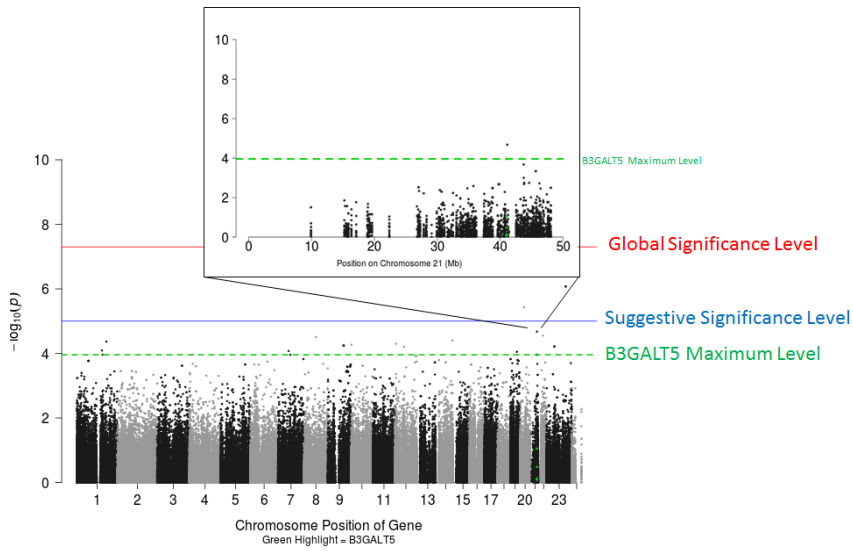
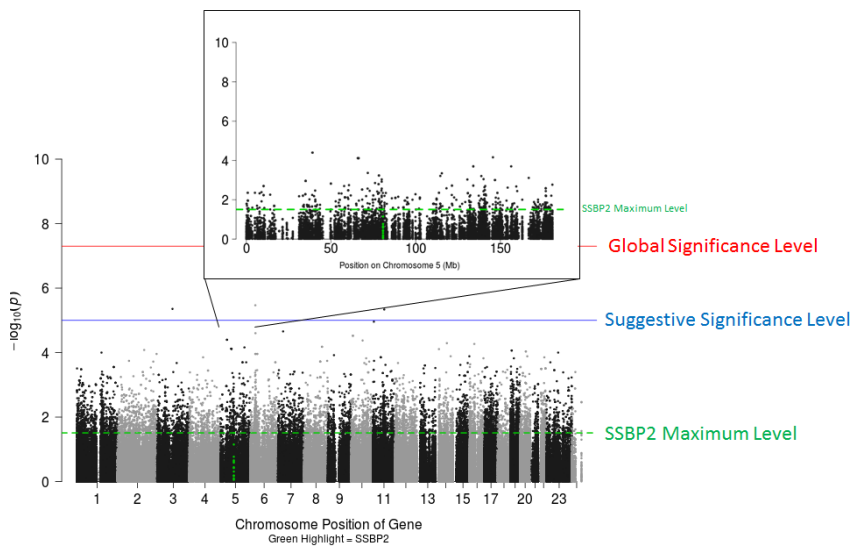


A**B****C**

Supplemental Fig. S1. Global eQTL analysis reveals little evidence of trans-eQTLs in the ADAMTS13 (A), B3GALT5 (B), and SSBP2 (C) post-term loci. The $-\log_{10}$ of the eQTL p-values of the association between the ADAMTS13 (A), B3GALT5 (B), and SSBP2 (C) loci and expression in various tissue types in the GTEx database. For rs655911 (ADAMTS13 locus), the only significant peak is at the ADAMTS13 gene ($p=1.5 \times 10^{-8}$). For rs1534080 (B3GALT5 locus), no globally significant ($p < 5 \times 10^{-8}$) peaks were identified for, but the highest peak is at the B3GALT5 gene ($p=9 \times 10^{-5}$). For rs2135 (SSBP2 locus), the highest peaks are not at the SSBP2 locus, but are spread out amongst other areas of the genome. Tissue types tested: subcutaneous adipose, aortic artery, tibial artery, heart (left ventricle), lung, tibial nerve, sun-exposed skin (lower leg), skeletal muscle, mucosa and muscularis of the esophagus, thyroid, mammary (breast) tissue, and whole blood.

SNP	Chromosome	5' position	sequence	Forward/Reverse	Product size (bp)
rs4687715	3	53,235,493	AGGAAAGTGAGGAAGGGTGG	Forward	1431
rs4687715	3	53,236,923	CCCCACCCCTAACTCTAACA	Reverse	
rs2135	5	81,795,000	CAGGCTGCATCCAAGCAAG	Forward	1491
rs2135	5	81,796,490	AGAGGGATGCTAGCTCTCCT	Reverse	
rs78598508	11	100,769,075	AGGCAGTTGTAACACAGTGG	Forward	894
rs78598508	11	100,769,968	CAGCCAGGATGTGCAGTTTT	Reverse	
rs111702173	21	39,651,024	TGTCTTCCCCTGAATCGGTG	Forward	728
rs111702173	21	39,651,751	TAGCTTCGCCGGTATTTGGA	Reverse	
rs111702173	SDM primers		CTGGAGTAGATTCTCCGGACAGCCTCAGA AGAAC	Forward	
rs111702173	SDM primers		GTTCTTCTGAGGCTGTCCGGGAGAATCTACT CCAG	Reverse	
rs560928	21	39,656,207-	GCAGGGACGTTGATGTTGTT	Forward	159
rs560928	21	39,656,703	TGCAGAACGTGTAGACCTCC	Reverse	

Supplemental Table S1. Primer sequences used to amplify genomic DNA regions to test for enhancer activity in the Post-term loci.

A

Cohort	rsID	Chr	Coordinates (NCBI Build 38)	GENECODE Gene	P-Value
NFBC1966	rs12571151	10	2416828	RP11-446F3.2	7.04E-06
	rs12257796	10	2418708	RP11-446F3.2	7.04E-06
	rs11248532	10	123445888	RP11-282I1.1	5.56E-06
	rs12285957	11	6542816	DNHD1	2.14E-07
	rs1463732	12	19803450	RP11-405A12.2	4.10E-06
	rs999227	12	19844354	RP11-405A12.2	9.52E-06
	rs10841383	12	19845405	RP11-405A12.2	9.41E-06
	rs11635432	15	101580136	TM2D3	8.65E-06
	rs2121206	15	101580301	TM2D3	8.87E-06
	rs12902757	15	101580692	TM2D3	9.07E-06
	rs12101912	15	101580774	TM2D3	7.70E-06
	rs10854398	21	39649825	B3GALT5	1.57E-06
	rs1534080	21	39651826	B3GALT5	9.79E-07
	rs8132770	21	39653957	B3GALT5	8.43E-07
	rs560928	21	39656644	B3GALT5	5.00E-04
NFBC1986	rs6734412	2	291276	AC079779.4	7.56E-06
	rs72774523	2	304478	AC079779.5	6.24E-06
	rs72774524	2	305346	AC079779.5	3.37E-06
	rs12612077	2	3843037	DCDC2C	6.92E-06
	rs55804313	2	3843667	DCDC2C	6.92E-06
	rs11679758	2	3846292	DCDC2C	6.92E-06
	rs55742273	2	3847416	DCDC2C	6.92E-06
	rs17018173	2	3848103	DCDC2C	6.92E-06
	rs17018176	2	3848430	DCDC2C	6.92E-06
	rs12477884	2	3849890	DCDC2C	6.92E-06
	rs62107652	2	3851348	DCDC2C	6.92E-06
	rs61512202	2	3851386	DCDC2C	6.92E-06
	rs11693904	2	3856403	DCDC2C	7.68E-06
	rs17018208	2	3856717	DCDC2C	6.92E-06
	rs60124171	2	3856929	DCDC2C	6.92E-06
	rs60852654	2	3856940	DCDC2C	6.92E-06
	rs62107654	2	3857010	DCDC2C	6.92E-06
	rs12477500	2	3857589	DCDC2C	6.92E-06
	rs12464001	2	3858107	DCDC2C	7.10E-06
	rs12475409	2	3858328	DCDC2C	6.92E-06
	rs17018215	2	3861268	DCDC2C	7.09E-06
	chr2:3896520:D	2	3896520	DCDC2C	6.92E-06
	chr2:3909181:I	2	3909181	DCDC2C	7.09E-06
	rs62135521	2	44068863	LRPPRC	5.69E-06
	rs75199129	2	44071636	LRPPRC	5.69E-06
	rs62135525	2	44072740	LRPPRC	5.69E-06
	rs62135536	2	44098889	U6	6.86E-06

rs62136969	2	44132737	U6	6.19E-06
rs4687715	3	53235888	TKT	8.04E-06
rs145023824	4	8946821	HMX1	2.07E-06
rs66858738	5	32452481	ZFR	4.83E-06
chr5:81088891:D	5	81088891	RASGRF2	1.22E-06
rs12521503	5	81782627	SSBP2	5.86E-06
rs378482	5	81784169	SSBP2	5.86E-06
rs401996	5	81790535	SSBP2	1.49E-06
rs384075	5	81791185	SSBP2	1.49E-06
rs391229	5	81793043	SSBP2	1.41E-06
rs456778	5	81794669	SSBP2	1.45E-06
rs463247	5	81795097	SSBP2	1.50E-06
rs2135	5	81795581	SSBP2	1.55E-07
rs457700	5	81796274	SSBP2	2.21E-06
rs386424	5	81796968	SSBP2	2.01E-06
rs462122	5	81797718	SSBP2	1.96E-06
rs72784027	5	118225881	DTWD2	1.96E-06
rs72784032	5	118235946	DTWD2	1.98E-06
rs11739538	5	118822305	DTWD2	1.89E-06
rs11750860	5	118885894	DTWD2	1.89E-06
rs11741257	5	118894945	DTWD2	1.89E-06
rs17440178	5	118903953	DTWD2	1.78E-06
rs183770336	6	102794582	GRIK2	5.82E-06
rs117533178	6	151989489	ESR1	9.98E-06
rs7013779	8	40942080	RP11-465K16.1	2.19E-06
rs1553932	8	40949972	RP11-465K16.1	5.96E-06
rs79648768	8	72706578	KCNB2	8.27E-06
chr8:73557501:D	8	73557501	STAU2	7.81E-06
rs10780480	9	80987559	RP11-289F5.1	1.86E-06
rs1582027	9	80994776	RP11-289F5.1	1.95E-06
rs10780482	9	80995813	RP11-289F5.1	2.20E-06
chr9:90067785:I	9	90067785	N/A	7.23E-06
rs655911	9	133447776	ADAMTS13	4.85E-08
rs75320537	10	50188977	ASAH2	5.90E-06
rs10995050	10	62123476	AL671972.1	6.07E-06
rs7950344	11	92763108	FAT3	4.68E-06
rs72965926	11	95705915	RP11-644L4.1	6.95E-06
chr11:100631998:I	11	100631998	ARHGAP42	2.10E-06
rs78598508	11	100769446	ARHGAP42	8.08E-07
rs2239507	12	5041968	KCNA5	5.16E-06
rs79766994	12	93997910	7SK	6.99E-06
rs11610162	12	94030905	7SK	4.30E-06
rs11609845	12	100902544	ANO4	9.85E-06
rs78874632	14	58276011	C14orf37/PSMA-AS1	9.39E-06
rs191706929	14	61884310	CTD-2277K2.1	3.55E-06

	rs77835182	14	61929868	CTD-2277K2.1	3.55E-06
	chr14:62234490:D	14	62234490	CTD-2277K2.1	9.26E-06
	rs6575274	14	92680353	RIN3	3.81E-06

B

Cohort	rsID	Chr	Coordinates (NCBI Build 38)	GENECODE Gene	P-Value
NFBC1966	rs12612077	2	3843037	AC019172.2	2.60E-01
	rs11679758	2	3846292	AC019172.2	2.72E-01
	rs17018173	2	3848103	AC019172.2	2.69E-01
	rs17018176	2	3848430	AC019172.2	2.69E-01
	rs11693904	2	3856403	AC019172.2	2.13E-01
	rs17018208	2	3856717	AC019172.2	2.26E-01
	rs12477500	2	3857589	AC019172.2	2.19E-01
	rs12464001	2	3858107	AC019172.2	2.25E-01
	rs4687715	3	53235888	TKT	1.53E-02
	rs12521503	5	81782627	SSBP2	1.95E-02
	rs378482	5	81784169	SSBP2	1.95E-02
	rs401996	5	81790535	SSBP2	2.06E-02
	rs384075	5	81791185	SSBP2	2.13E-02
	rs391229	5	81793043	SSBP2	2.23E-02
	rs456778	5	81794669	SSBP2	1.99E-02
	rs463247	5	81795097	SSBP2	2.13E-02
	rs2135	5	81795581	SSBP2	2.19E-02
	rs457700	5	81796274	SSBP2	2.48E-02
	rs386424	5	81796968	SSBP2	2.21E-02
	rs462122	5	81797718	SSBP2	3.92E-03
	rs11739538	5	118822305	DTWD2	1.69E-01
	rs11750860	5	118885894	DTWD2	6.23E-01
	rs11741257	5	118894945	DTWD2	5.81E-01
	rs17440178	5	118903953	DTWD2	4.49E-01
	rs10780480	9	80987559	RP11-289F5.1	9.32E-01
	rs652600*	9	133445896	ADAMTS13	2.87E-01
rs2239507	12	5041968	KCNA5	2.02E-01	
rs11609845	12	100902544	ANO4	NA	
NFBC1986	rs12571151	10	2416828	RP11-446F3.2	7.40E-02
	rs12257796	10	2418708	RP11-446F3.2	7.40E-02
	rs11248532	10	123445888	RP11-282I1.1	3.58E-01
	rs12285957	11	6542816	DNHD1	8.81E-01
	rs1463732	12	19803450	RP11-405A12.2	2.70E-01
	rs999227	12	19844354	RP11-405A12.2	2.63E-01
	rs10841383	12	19845405	RP11-405A12.2	2.63E-01
	rs10854398	21	39649825	B3GALT5	6.91E-01
	rs1534080	21	39651826	B3GALT5	6.90E-01

rs8132770	21	39653957	B3GALT5	5.33E-01
rs560928	21	39656644	B3GALT5	2.60E-02
rs111702173	21	39651360	B3GALT5	1.69E-02

*rs652600 is in LD with rs655911

Supplemental Table 2. Cross-Validation of the NFBC1966 and NFBC1986 cohorts resulted in five significant loci: B3GALT5, SSBP2, TKT, ARGHAP42, and ADAMTS13. Using a cross-validation methodology of a discovery phase (A, GWAS $p < 1 \times 10^{-5}$) and a validation phase (B, GWAS $p < 0.05$), it was found that the B3GALT5, SSBP2, TKT, and ARGHAP42 loci are significantly associated with post-term birth. Additionally, the *ADAMTS13* locus reached global significance ($p < 5 \times 10^{-8}$).

SNP	Locus	Spatial Connections
rs560928	B3GALT5	chr21:42080001-42090000
rs2135	SSBP2	None
rs4687715	TKT	chr21:9650001-9660000
rs655911	ADAMTS13	chr9:136340001-136350000, chr9:136330001-136340000, chr9:137560001-137570000, chr5:18160001-18170000, chr1:174900001-174910000
rs78598508	ARHGAP42	chrX:93780001-93790000
rs111702173	B3GALT5	chr21:42080001-42090000

Supplemental Table 3. Spatial Results from GWAS3D identify significant spatial connections between loci in the validated GWAS data and distant genomic regions. The *ADAMTS13* locus had multiple spatial connections, *SSBP2* had none, while the others only exhibited a single spatial association.

Self/Spatial	SNP	Chr	Coordinates (NCBI Build 37)	SNP Locus	eQTL Gene	Effect Size	P-Value	Tissue
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.31	1.50E-08	Nerve - Tibial
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.33	1.50E-07	Skin - Sun Exposed (Lower leg)
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.52	3.00E-07	Pituitary
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.18	6.30E-06	Cells - Transformed fibroblasts
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.44	7.10E-06	Brain - Cortex
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.26	8.20E-06	Adipose - Subcutaneous
Self	rs4687715	3	53235888	TKT	TKT	-0.21	2.00E-05	Heart - Left Ventricle
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.27	2.20E-05	Esophagus - Mucosa
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.36	5.80E-05	Brain - Cerebellum
Self	rs8132770	21	39653957	B3GALT5	B3GALT5	0.29	9.00E-05	Thyroid
Self	rs1534080	21	39651826	B3GALT5	B3GALT5	0.28	1.10E-04	Thyroid
Self	rs10854398	21	39649825	B3GALT5	B3GALT5	0.28	1.20E-04	Thyroid
Self	rs4687715	3	53235888	TKT	TKT	-0.18	1.30E-04	Esophagus - Mucosa
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.22	2.30E-04	Lung
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.17	3.80E-04	Thyroid
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.27	4.40E-04	Skin - Not Sun Exposed (Suprapubic)
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.24	6.00E-04	Breast - Mammary Tissue
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.13	6.80E-04	Muscle - Skeletal
Self	rs4687715	3	53235888	TKT	TKT	-0.24	7.80E-04	Brain - Caudate (basal ganglia)
Spatial	rs655911	9	133447776	ADAMTS13	SLC2A6	-0.2	1.20E-03	Brain - Anterior cingulate cortex
Self	rs10854398	21	39649825	B3GALT5	B3GALT5	-0.24	1.70E-03	Stomach
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.29	2.00E-03	Pancreas
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.24	2.40E-03	Adipose - Visceral (Omentum)
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.21	2.50E-03	Artery - Aorta
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.15	2.70E-03	Whole Blood
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.17	3.30E-03	Artery - Tibial
Self	rs1534080	21	39651826	B3GALT5	B3GALT5	-0.23	3.30E-03	Stomach

Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.25	4.30E-03	Uterus
Self	rs8132770	21	39653957	B3GALT5	B3GALT5	-0.22	4.60E-03	Stomach
Self	rs78598508	11	100769446	ARHGAP42	ARHGAP42	-0.53	4.60E-03	Brain - Hypothalamus
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.21	4.90E-03	Brain - Frontal Cortex (BA9)
Spatial	rs8132770	21	39653957	B3GALT5	B3GALT5	0.33	4.90E-03	Small Intestine - Terminal Ileum
Self	rs655911	9	133447776	ADAMTS13	ADAMTS13	0.3	5.00E-03	Brain - Hippocampus

Supplemental Table 4. eQTL analysis supports the ADAMTS13-SLC2A6 spatial connection, but also confirms self-eQTLs for the ADAMTS13, TKT, and B3GALT5 post-term loci. Using GTEx to determine effect size and significance of SNP-gene expression associations, it was determined that a number of eQTLs exist that support the spatial connections. This table includes all self- and spatial-eQTLs with $p < 5 \times 10^{-3}$ in GTEx (version 6).