Table S1 Primers used for qPCR.

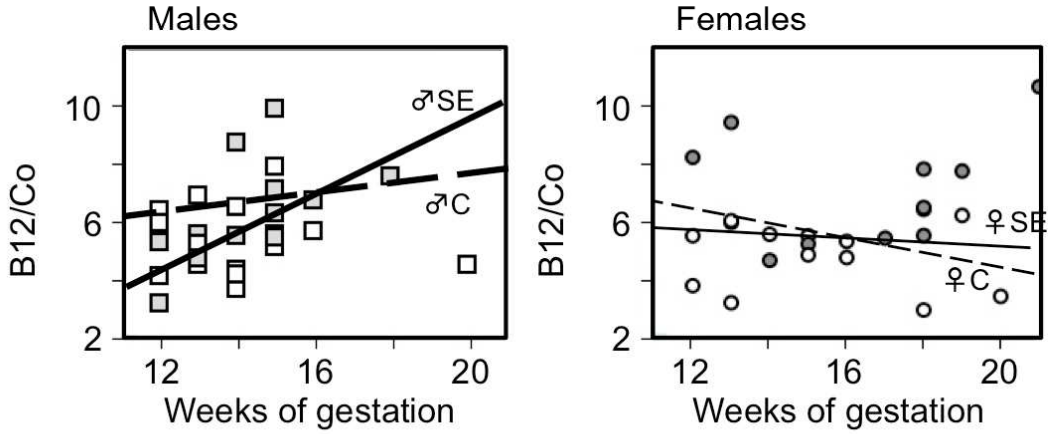
Gene name	**Gene**	**Forward**	**Reverse**
Methylenetetrahydrofolate reductase (NAD(P)H)	*MTHFR*	Gagggaggcttcaactacgcagtg	tgaaatcggctcccgcagac
5-methyltetrahydrofolate-homocysteine methyltransferase reductase	*MTRR*	Aacagaggttctgcggaagggagt	tctggtaagtggaaagaatttgttgttcg
Glycine N-methyltransferase	*GNMT*	ccagcgggtgctcgacgtag	cccacttgtcgaaggcggg
Cystathionase (cystathionine gamma-lyase)	*CTH*	Ttcgccacgcaggcgatc	aaggcaattcctagtgggatttccag
5-methyltetrahydrofolate-homocysteine methyltransferase	*MTR*	atgctccccggcctatctttatttc	aaaaggtctcatttcagctgcaccc
Insulin-like growth factor 2 (somatomedin A)	*IGF2*	Ttcttggccttcgcctcgtg	gccaggtcacagctgcgga
Glucocorticoid receptor (Nuclear receptor subfamily 3, group C, member 1)	*GR (NR3C1)*	cctggtcgaacagtttttctaatggct	gttaagactccataatgacatcctgaagcttc
DNA (cytosine-5-)-methyltransferase 1	*DNMT1*	tgtgtacctgccccctgaggc	cggccaattcggtagggctc
DNA (cytosine-5-)-methyltransferase 3 alpha	*DNMT3A*	Gccaggccgcattgtgtctt	tgtacgtggcctggtggaacg
DNA (cytosine-5-)-methyltransferase 3 beta	*DNMT3B*	Gcccgccatggtggtgtct	Cttattgaaggtggccaaattaaagtgctg

Table S2. Fetal human hepatic essential element content. Values are expressed as mean±s.e.m, ng/g dry liver weight. Values in the same row that do not share a superscript letter are significantly different ($p<0.05$) due to maternal cigarette smoking or fetal sex. Absence of superscript letters indicates no significant differences.

Element/Compound	**Male fetuses**		**Female fetuses**	
	Control	**Smoke-exposed**	**Control**	**Smoke-exposed**
n	*14*	*16*	*14*	*11*
Significantly affected by maternal cigarette smoking				
Co	91.1±8.5 [a]	74.6±7.2 [a]	128.1±11.3 [b]	68.5±7.2 [a]
B12	497±51 [a]	417±34 [a]	643±48 [b]	441±36 [a]
Mn	12.9±0.8 [a]	9.9±0.7 [b]	11.9±1.1 [ab]	9.8±0.9 [ab]
Li	114±7 [a]	154±33 [ab]	134±5 [bc]	120±4 [a]
Not significantly affected by maternal cigarette smoking				
Mg	1893±100	1789±66	1848±52	1887±65
Al	2.1±0.1	2.2±0.2	2.3±0.1	2.3±0.2
Fe	6721±707	6193±452	7125±461	6216±536
Ni	1100±493	612±59	678±56	874±261
Cu	476±31	444±31	460±32	435±34
Zn	2045±168	2111±146	2084±95	1954±125
As	63.4±18.1	44.1±5.6	37.9±6.4	36.6±10.4
Se	3611±184	3552±85	3890±267	3716±136
Rb	41.0±2.7	37.5±3.4	38.0±1.9	38.8±2.3
Sr	656±35 [a]	680±18 [ab]	733±23 [b]	688±31 [ab]
Mo	700±43	678±27	689±25	693±37
Pb	330±29	309±18	306±15	305±20

Supplementary FIG. S1.

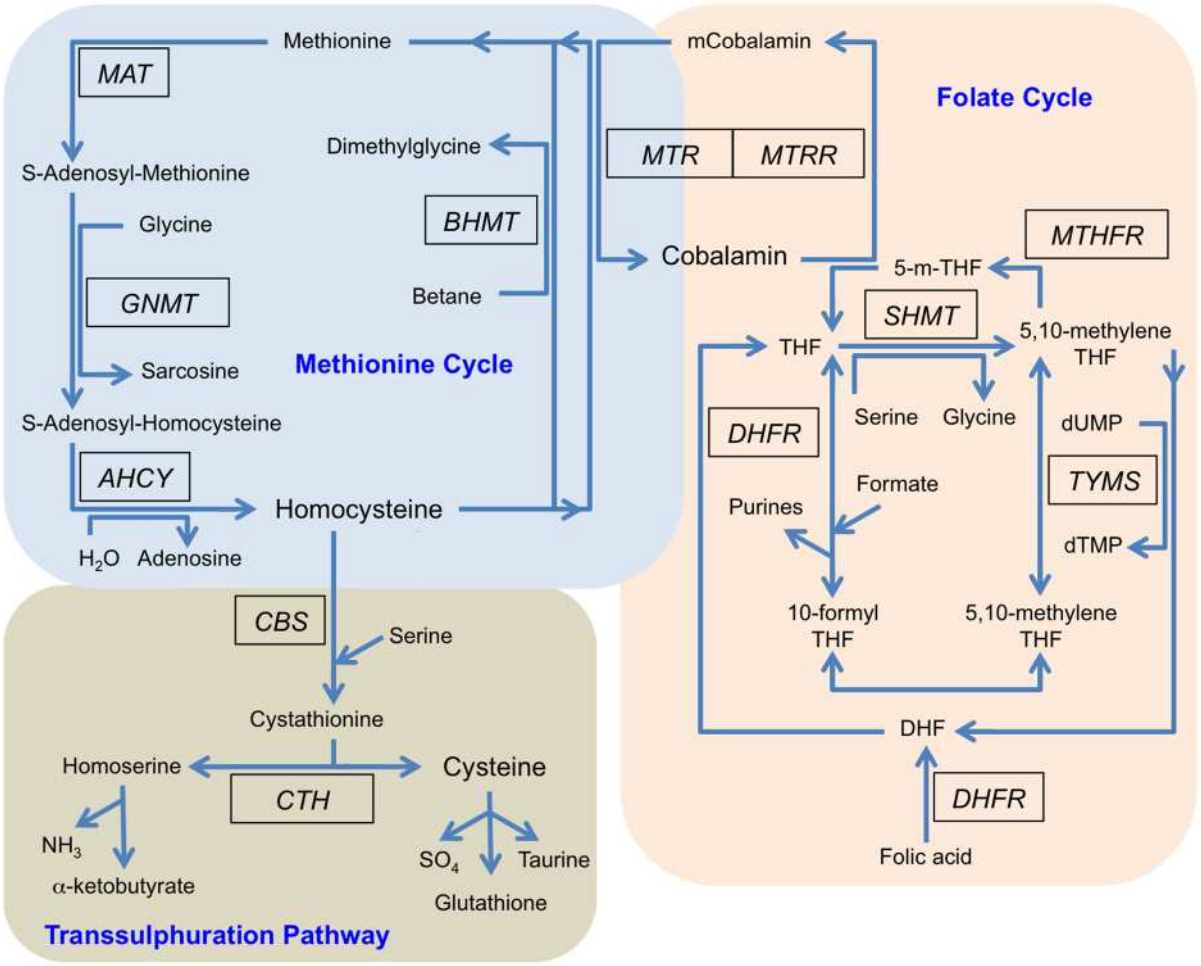
Maternal smoking is associated with a significant (A) increase in the ratio between hepatic Co and vitamin B12 in male fetuses only across the second trimester. Males are shown by squares, females by circles, controls are open, smoke-exposed are shaded. “NSm” represents control fetuses from non-smoking mothers; “Sm” represents smoke-exposed fetuses from mothers who smoked during pregnancy. Fetal sex is denoted by the appropriate symbol.



♂Sm B12/Co=-3.26-0.64*weeks, **P=0.036**
♂NSm B12/Co= 6.53-0.07*weeks, P=0.657
♀Sm B12/Co= 4.37-0.16*weeks, P=0.459
♀NSm B12/Co= 9.44-0.25*weeks, P=0.411

Supplementary FIG. S2.

Summary of the1-Carbon metabolism pathway. Simplified and modified diagram based on Steegers-Theunissen, R.P.M., Twigt, J., Pestinger, V. & Sinclair, K.D. The periconceptional period, reproduction and long-term health of offspring: the importance of one-carbon metabolism. *Human Reproduction Update* **19**, 640-655 (2013).



Supplementary FIG. S3.

Fetal liver methylation levels of specific or mean CpGs for *IGF*2 (A) and *GR/ NC3C1* (B) increase significantly across the second trimester. Males are shown by squares, females by circles, controls are open, smoke-exposed are shaded.