

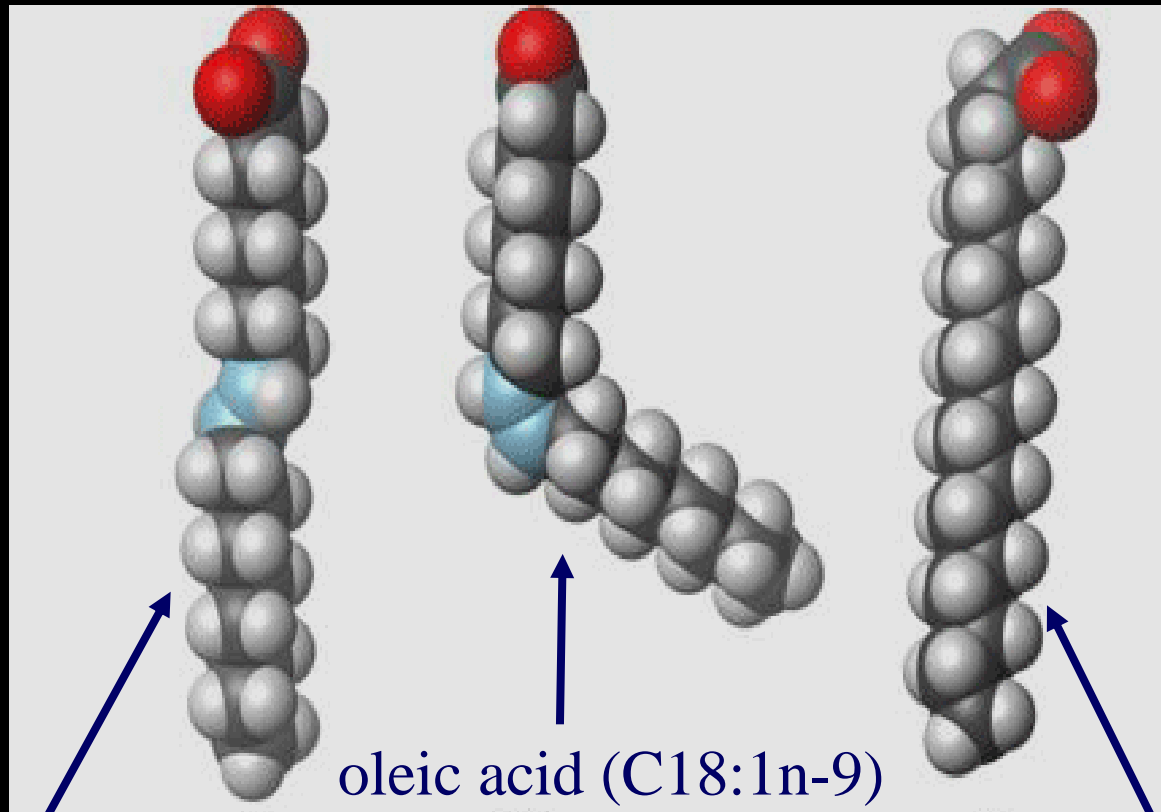
# Trans isomeric and long-chain polyunsaturated fatty acids are inversely correlated in erythrocyte membrane lipids at mid-gestation

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# Cis and trans isomers



elaidic acid (C18:1t)

**trans isomer**

oleic acid (C18:1n-9)

**cis isomer**

stearic acid  
(C18:0)

**saturated**

<http://www.people.umass.edu/kthesis/tfa.htm>

# Mothers investigated at the 20th week of gestation

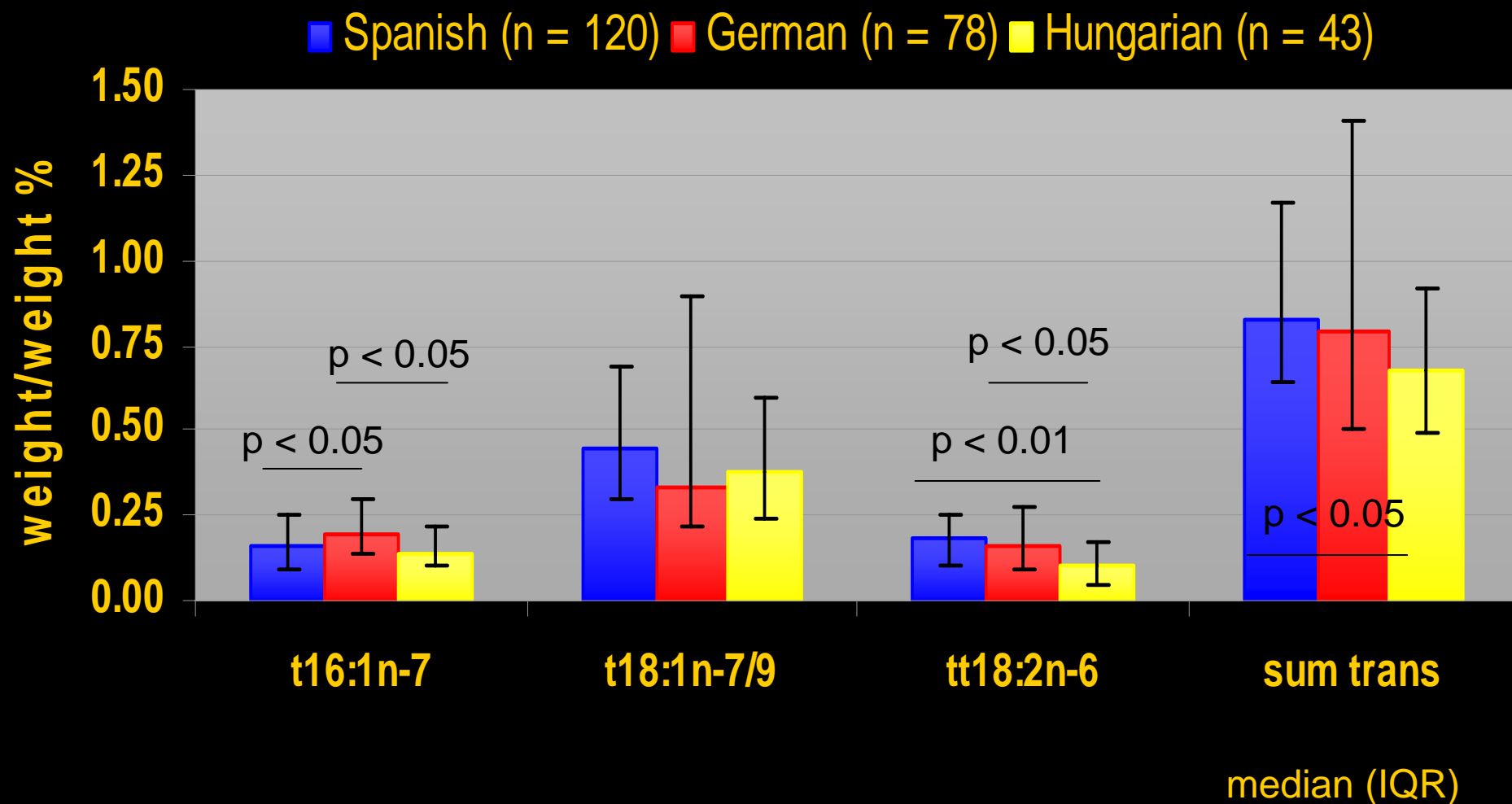
Mean (SD) <sup>#</sup>	Spanish (n = 120)	German (n = 78)	Hungarian (n = 43)
Age (year) <sup>#</sup>	30.0 (4.7)	32.8 (4.5)	29.3 (6.8)
Height (cm) <sup>#</sup>	161.7 (6.0)	166.6 (6.7)	164.5 (6.6)
Weight (kg) <sup>#</sup>	67.7 (9.0)	67.6 (10.8)	69.0 (12.6)
Parity (1, 2, 3 or more)	61, 42, 10 <sup>*</sup>	28, 30, 20	18, 16, 8 <sup>**</sup>

\* 7 data are missing; \*\* 1 data is missing

# Method

Fatty acid composition of erythrocyte membrane lipids was determined by high-resolution capillary gas-liquid chromatography.

# Trans fatty acids in the phosphatidylcholine fraction at the 20th week of gestation



# Correlations in phosphatidylcholine fraction at the 20th week of gestation I.

LA (C18:2n-6)	Spearman's rho correlation coefficients		
	Spanish	German	Hungarian
t16:1n-7	0.034	0.130	-0.049
t18:1n-7/9	-0.113	-0.158	0.062
tt18:2n-6	-0.287 <sup>b</sup>	-0.060	0.190
Sumtrans	-0.171	-0.121	0.108

<sup>a</sup> =  $p < 0.05$ ; <sup>b</sup> =  $p < 0.01$

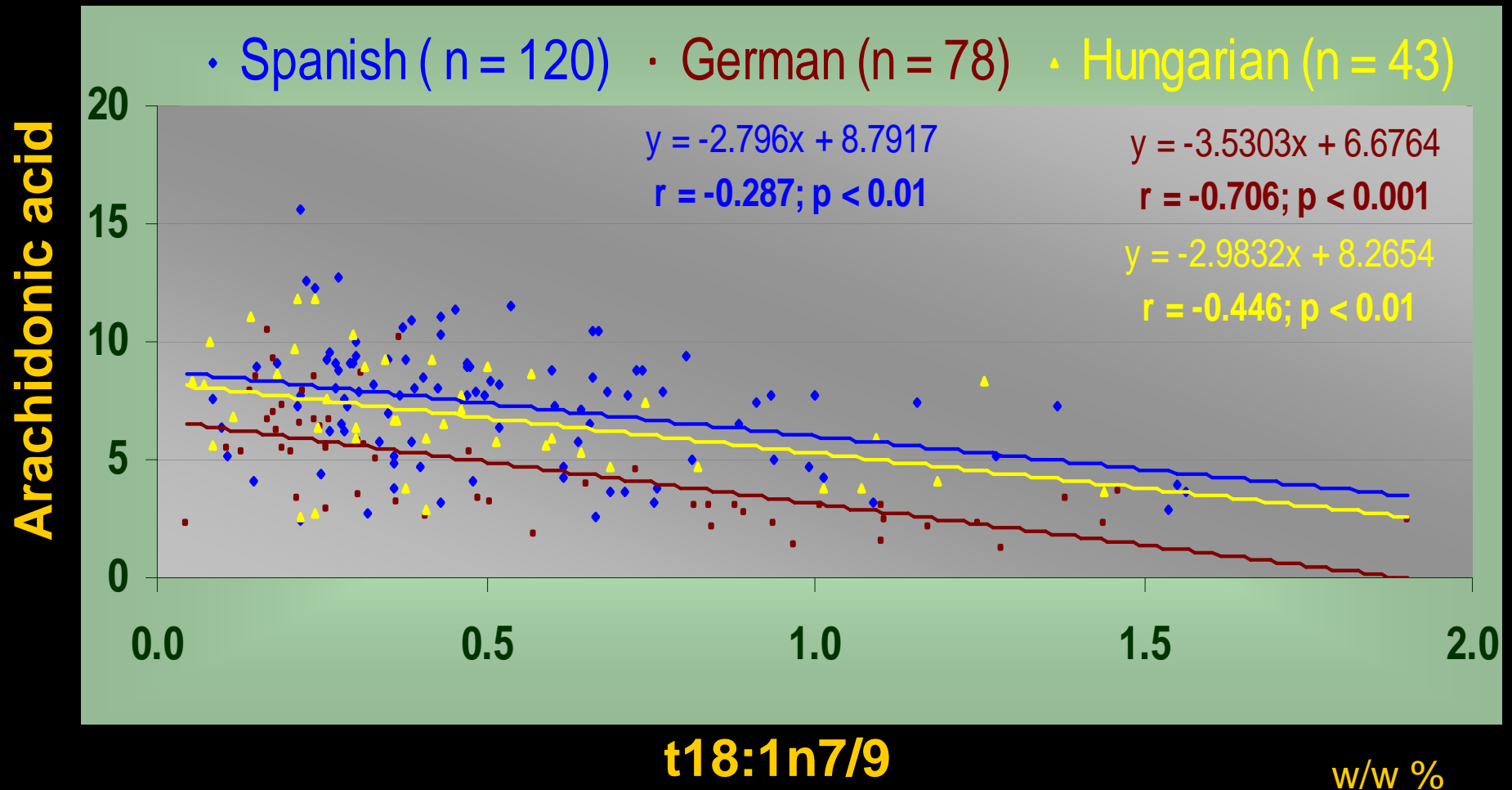
## Correlations in phosphatidylcholine fraction at the 20th week of gestation II.

AA (C20:4n-6)	Spearman's rho correlation coefficients		
	Spanish	German	Hungarian
t16:1n-7	0.050	-0.357 <sup>b</sup>	0.107
t18:1n-7/9	-0.287 <sup>b</sup>	-0.706 <sup>c</sup>	-0.446 <sup>b</sup>
tt18:2n-6	-0.154	-0.621 <sup>c</sup>	-0.387 <sup>b</sup>
Sumtrans	-0.283 <sup>b</sup>	-0.775 <sup>c</sup>	-0.469 <sup>b</sup>

<sup>a</sup> =  $p < 0.05$ ; <sup>b</sup> =  $p < 0.01$ ; <sup>c</sup> =  $p < 0.001$

# Correlations in phosphatidylcholine fraction at the 20th week of gestation III.

w/w %



## Correlations in phosphatidylcholine fraction at the 20th week of gestation IV.

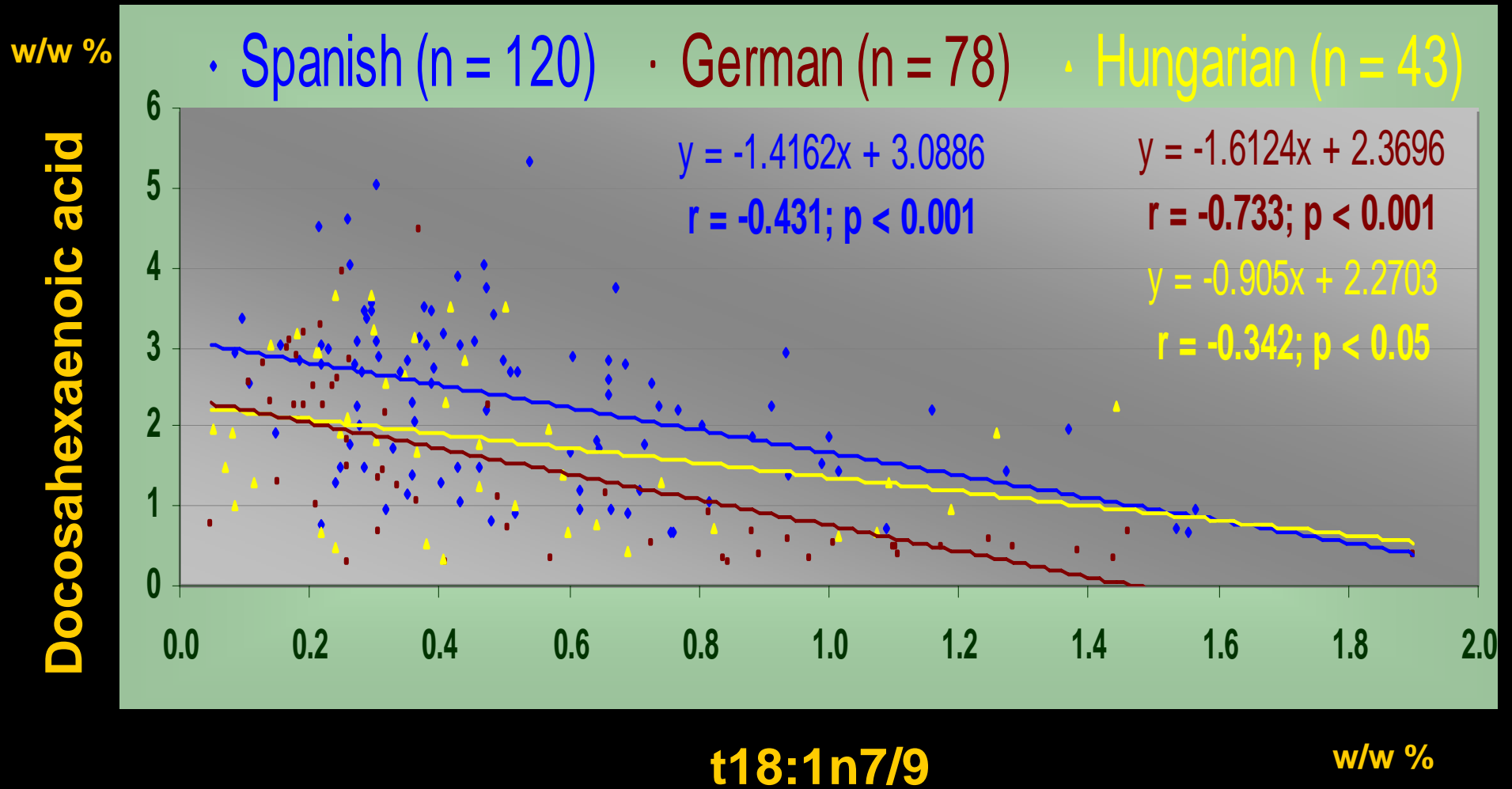
<b>ALA (C18:3n-3)</b>	Spearman's rho correlation coefficients		
	Spanish	German	Hungarian
t16:1n-7	0.034	0.194	0.210
t18:1n-7/9	-0.025	0.061	0.058
tt18:2n-6	0.051	0.223	0.199
Sumtrans	0.062	0.134	0.159

## Correlations in phosphatidylcholine fraction at the 20th week of gestation V.

DHA (C22:6n-3)	Spearman's rho correlation coefficients		
	Spanish	German	Hungarian
t16:1n-7	0.184	-0.308 <sup>a</sup>	0.113
t18:1n-7/9	-0.431 <sup>c</sup>	-0.733 <sup>c</sup>	-0.342 <sup>a</sup>
tt18:2n-6	-0.224 <sup>a</sup>	-0.677 <sup>c</sup>	-0.228
Sumtrans	-0.371 <sup>c</sup>	-0.769 <sup>c</sup>	-0.346 <sup>a</sup>

<sup>a</sup> =  $p < 0.05$ ; <sup>b</sup> =  $p < 0.01$ ; <sup>c</sup> =  $p < 0.001$

# Correlations in phosphatidylcholine fraction at the 20th week of gestation VI.



# Conclusion

- In this study we found significant inverse correlations between long-chain polyunsaturates and the sum of trans fatty acids in erythrocyte membrane PC lipids in expecting women at the 20th week of gestation.
- These data raise the possibility that maternal trans isomeric fatty acids may be inversely associated to the essential fatty acids status of the foetus.

***Thank you for your attention.***