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

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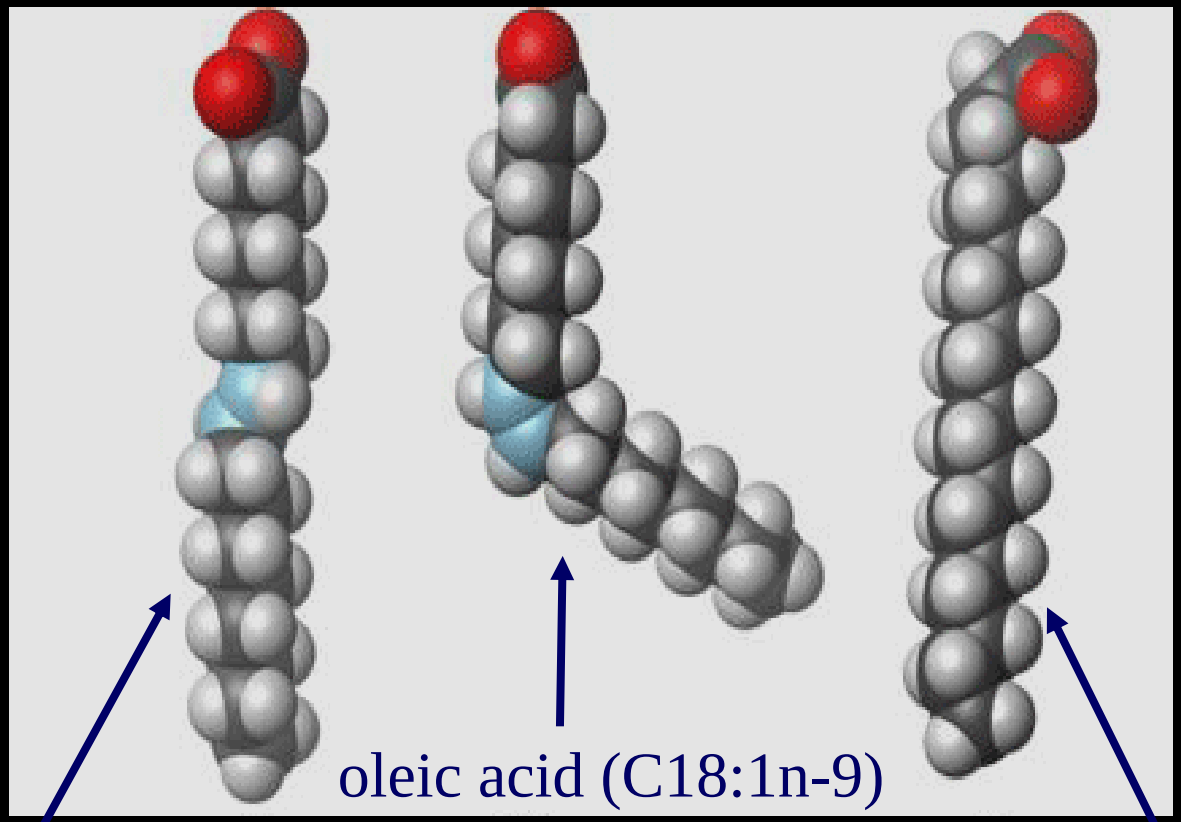
Cis and trans isomers



oleic acid (C18:1n-9)

cis isomer

elaidic acid (C18:1t)

trans isomer

stearic acid (C18:0)

saturated

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

Mothers investigated at the 20th week of gestation

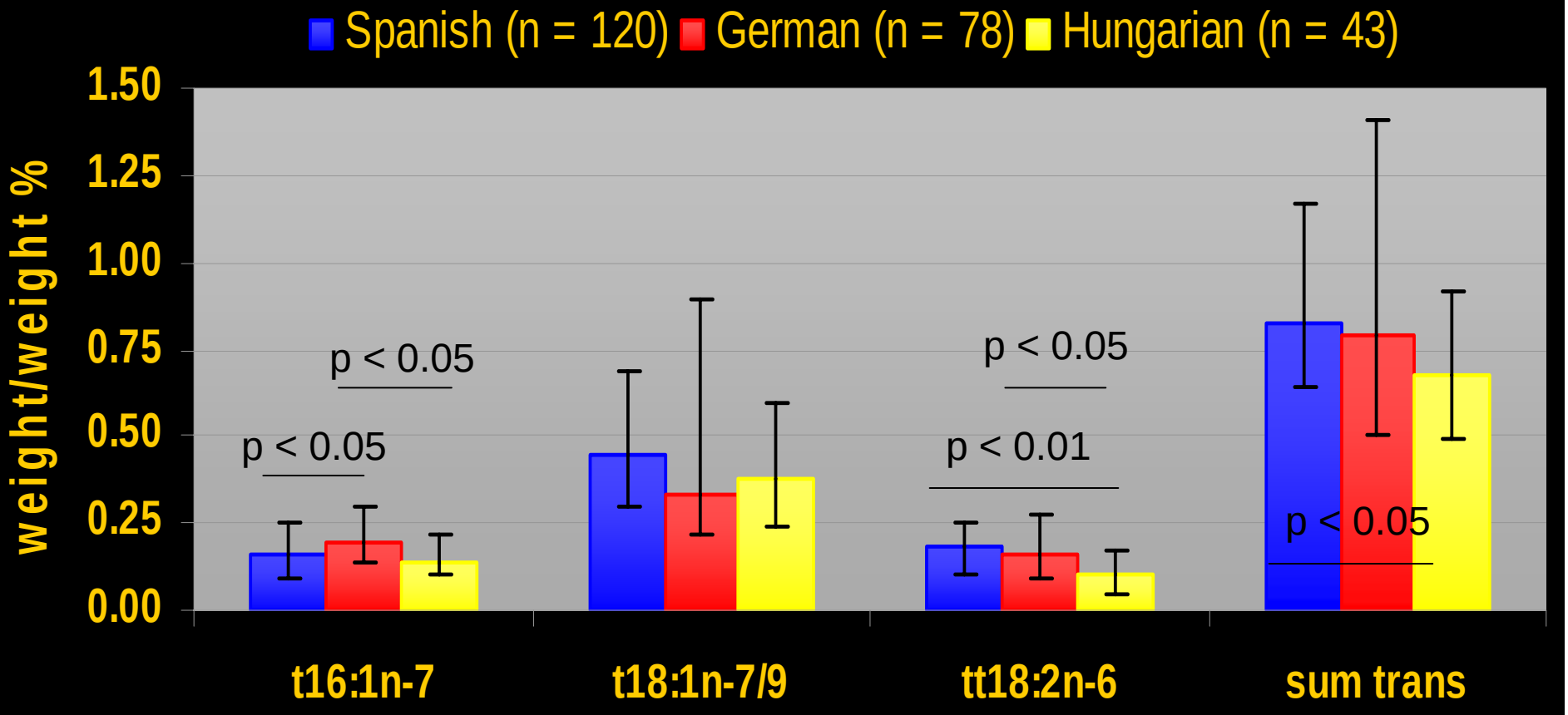
Mean (SD)[#]	Spanish (n = 120)	German (n = 78)	Hungarian (n = 43)
Age (year)[#]	30.0 (4.7)	32.8 (4.5)	29.3 (6.8)
Height (cm)[#]	161.7 (6.0)	166.6 (6.7)	164.5 (6.6)
Weight (kg)[#]	67.7 (9.0)	67.6 (10.8)	69.0 (12.6)
Parity (1, 2, 3 or more)	61, 42, 10*	28, 30, 20	18, 16, 8**

* 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



median (IQR)

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 [b]	-0.060	0.190
Sumtrans	-0.171	-0.121	0.108

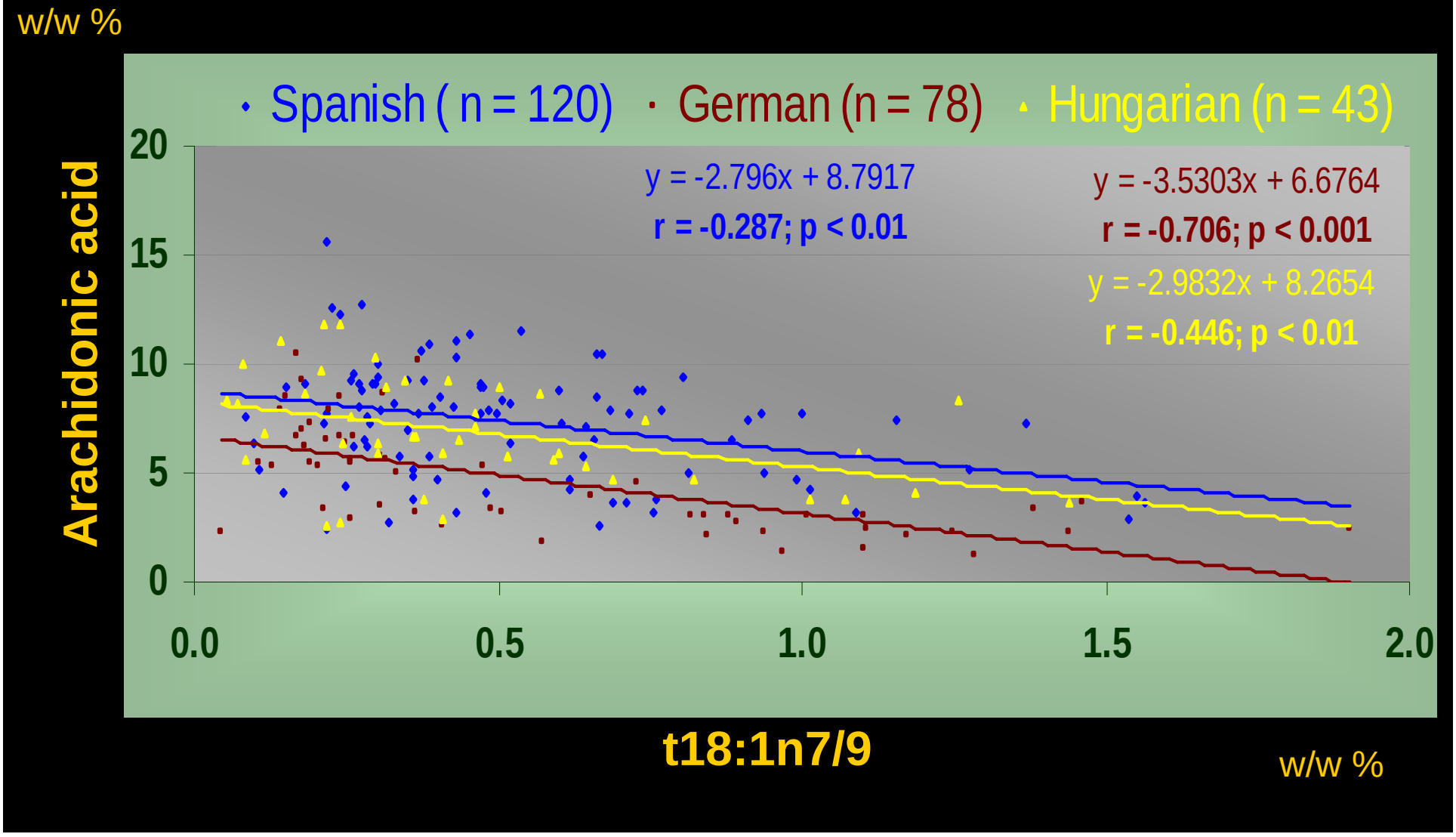
[a] = $p < 0.05$; [b] = $p < 0.01$

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 [b]	0.107
t18:1n-7/9	-0.287 [b]	-0.706 [c]	-0.446 [b]
tt18:2n-6	-0.154	-0.621 [c]	-0.387 [b]
Sumtrans	-0.283 [b]	-0.775 [c]	-0.469 [b]

[a] = $p < 0.05$; [b] = $p < 0.01$; [c] = $p < 0.001$

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



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

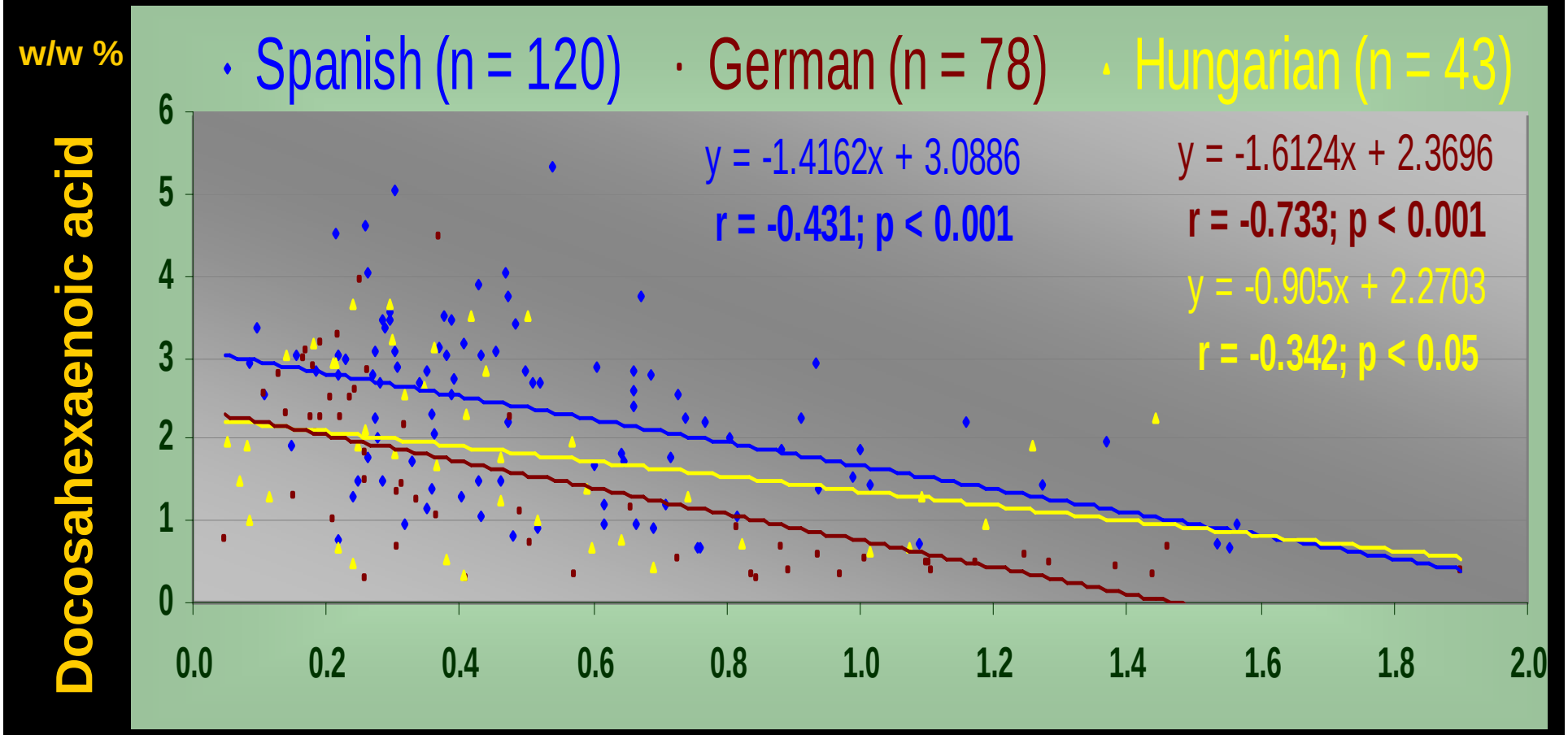
ALA (C18:3n-3)	Spearman's rho correlation coefficients		
	Spanish	German	Hungarian
t16:1n-7	0.034	0.194	0.210
t18:1n-7/9	-0.025	0.061	0.058
tt18:2n-6	0.051	0.223	0.199
Sumtrans	0.062	0.134	0.159

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 [a]	0.113
t18:1n-7/9	-0.431 [c]	-0.733 [c]	-0.342 [a]
tt18:2n-6	-0.224 [a]	-0.677 [c]	-0.228
Sumtrans	-0.371 [c]	-0.769 [c]	-0.346 [a]

[a] = $p < 0.05$; [b] = $p < 0.01$; [c] = $p < 0.001$

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.