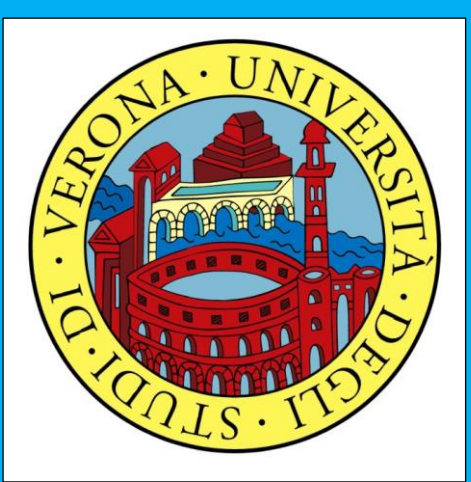# APOLIPOPROTEIN C-III GLYCOFORMS CORRELATE HETEROGENEOUSLY WITH PLASMA LIPID PROFILE IN SUBJECTS WITH CORONARY ARTERY DISEASE

Carmela Chiariello[a], Annalisa Castagna[a], Nicola Martinelli[a], Patrizia Guarini[a], Marcello Manfredi[b], Elia Ranzato[c], Simona Martinotti[c], Emilio Marengo[c], Daniela Cecconi[d], Oliviero Olivieri[a].

[a]Department of Medicine, Section of Internal Medicine B, University of Verona, Italy. [b]ISALIT S.r.l., Novara, Italy. [c]Department of Sciences and Technological Innovation, University of Piemonte Orientale, Alessandria, Italy. [d]Proteomics and Mass Spectrometry Laboratory, Department of Biotechnology, University of Verona, Verona, Italy.

AIMS: Apolipoprotein C-III (ApoC-III) is well recognized as a main determinant of triglyceride (TG) plasma concentration and plays a crucial role in coronary artery disease (CAD). However, data on Apo C-III glycoforms are only sparse so far. The aim of this study was to quantify Apo C-III glycoforms in CAD patients and to assess their correlations with plasma lipids.

METHODS: Apo C-III glycoforms were analysed by mass spectrometry in 55 subjects with clinically stable CAD (90.9% males, mean age 70.2±7.9 years) within the framework of the Verona Heart Study.

RESULTS:

Table 1. Clinical and laboratory characteristics of the study group subdivided by Apo C-III plasma concentration (*ANOVA test)

	Apo C-III<8.7(mg/dl)	8.7≤Apo C-III<11.7(mg/dl)	11.7≤Apo C-III<13.8(mg/dl)	Apo C-III≥13.8(mg/dl)	P*
Age	60.62±7.70	59.88±8.94	62±4.11	58.36±10.54	NS
Chol tot (mM/L)	3.90±0.36	4.15±0.53	4.56±0.84	5.07±1.01	<0.001
LDL (mM/L)	2.55±0.31	2.72±0.58	3.08±0.81	3.45±0.94	0.001
HDL (mM/L)	1.15±0.27	1.11±0.29	1.07±0.28	1.09±0.29	NS
TG (mM/L)	1.01±0.25	1.62±0.69	2.10±0.58	2.67±1.06	<0.001
Apo A (g/L)	1.41±0.23	1.49±0.16	1.51±0.24	1.55±0.21	0.096
Apo B (g/L)	0.64±0.13	0.71±0.17	0.79±0.29	0.97±0.26	<0.001
Apo E (g/L)	0.03±0.003	0.03±0.01	0.04±0.01	0.05±0.02	<0.001
Apo C-III (mg/dL)	6.88±1.56	10.26±1	12.88±0.57	16.52±1.91	<0.001

Figure 1. Apo C-III glycoforms distribution

- Apo C-III0 (non-sialylated)
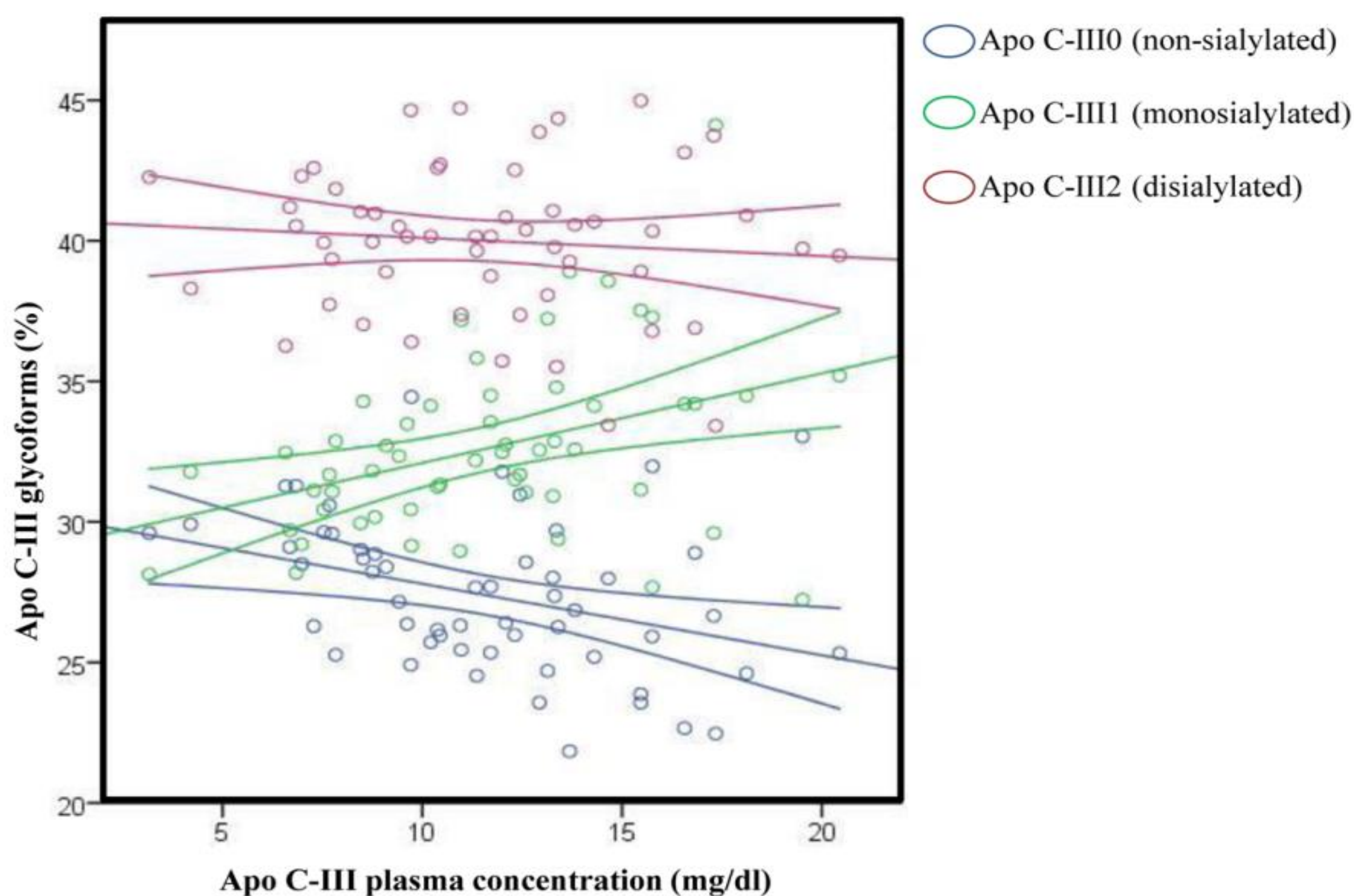- Apo C-III1 (monosialylated)
- Apo C-III2 (disialylated)

Figure 2. Apo CIII Isoforms distribution according to PUFA intake.
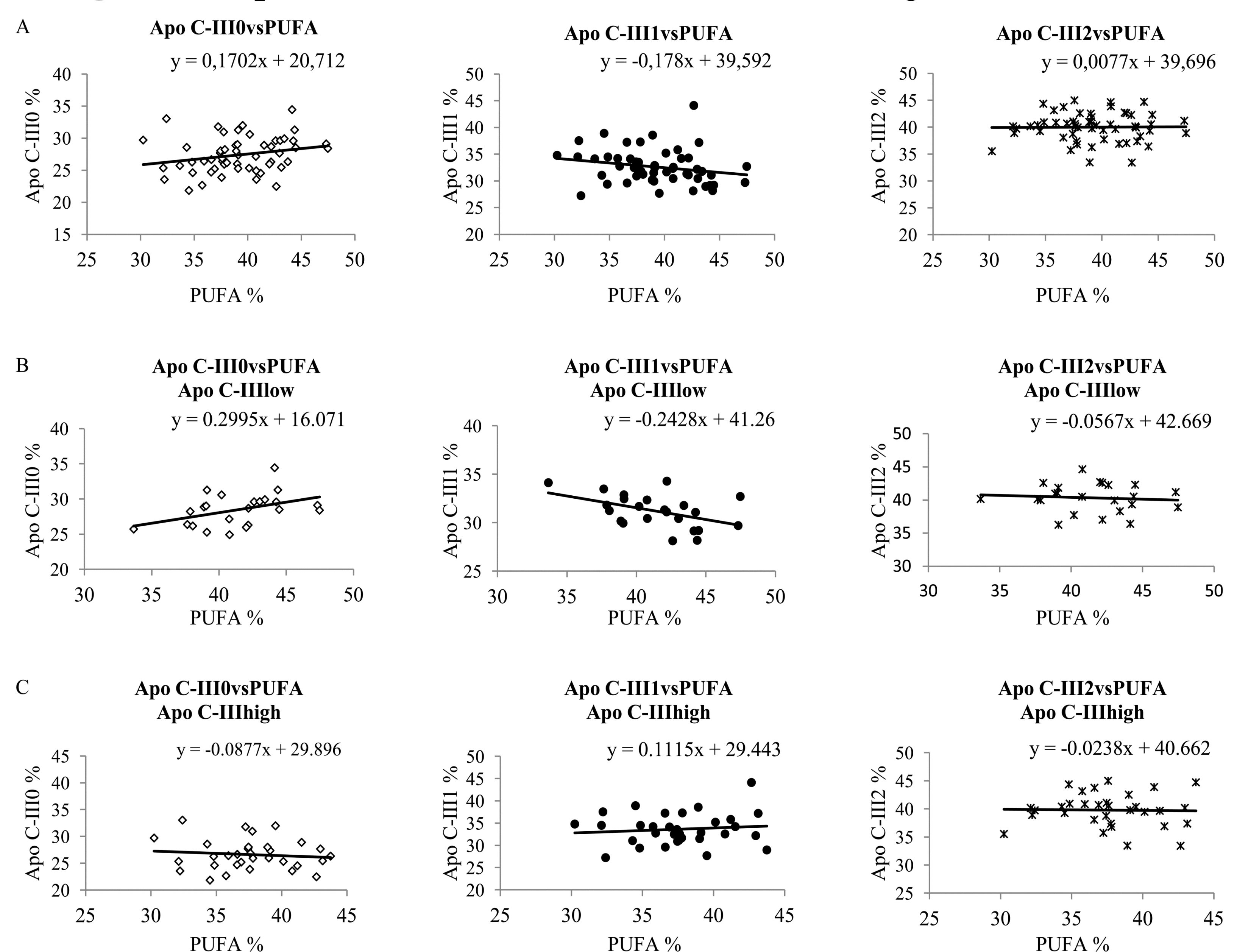

Table 2. Correlation between Apo C-III glycoforms and plasma lipid profile, including Apo E and Apo B concentration

%	HDL	LDL	Chol	TG	Apo E	Apo B	Apo C-III tot
Apo C-IIItot	r=-0.120 p=0.382	r= 0.544 p= 0.001	r= 0.619 p< 0.001	r= 0.792 p< 0.001	r=0.683 p<0.001	r=0.599 p< 0.001	/
Apo C-III0%	r= 0.182 p= 0.183	r=-0.317 p= 0.018	r=-0.314 p= 0.020	r=-0.421 p= 0.001	r=-0.434 p= 0.001	r=-0.292 p= 0.030	r=-0.351 p= 0.009
Apo C-III1%	r=-0.356 p= 0.008	r= 0.337 p= 0.012	r= 0.280 p= 0.038	r= 0.438 p= 0.001	r= 0.457 p< 0.001	r= 0.288 p= 0.033	r= 0.382 p= 0.004
Apo C-III2%	r= 0.234 p= 0.085	r=-0.074 p= 0.594	r=-0.010 p= 0.944	r=-0.086 p= 0.531	r=-0.095 p= 0.490	r=-0.040 p= 0.769	r=-0.091 p= 0.508
ApoC-III1/ Apo C-III0	r=-0.285 p= 0.035	r= 0.391 p= 0.003	r= 0.362 p= 0.007	r= 0.485 p< 0.001	r= 0.517 p< 0.001	r= 0.350 p= 0.009	r= 0.445 p= 0.001

Conclusions

Our results suggest that Apo C-III glycoforms vary in their association with plasma lipids and apoliproteins. Thus, a measure of total Apo C-III may not strictly reflect the overall risk represented by the single isoform. In a comparable way to the concentration of total Apo C-III, the monosialylated isoform resulted to be statistically correlated with a less favorable lipid profile, including an increase of serum total and LDL cholesterol, TG, Apo B and Apo E. As a consequence, a relatively elevated amount of this isoform seemed to characterize the same "harmful" lipid situation that was observed when total Apo C-III is elevated.

References: Jian W. Et al., 2013 *Anal Chem.* **85**: 2867-2874**;**
Yassine H.N. et al., 2015 *Plos One.* **10**:e0144138 **;**
Olivieri O. et al., 2010 *J Thromb Haemost.* **8**: 463-471.

AUTHORS CONFLICT OF INTEREST DISCLOSURE: NOTHING TO DISCLOSE

Contact: carmela.chiariello@univr.it