

## Supplementary Information

**Table S1 Bivariate Huber Correlation Coefficients for  $\Delta T_2$  Values  
(Fresh minus Frozen Plasma or Serum Water  $T_2$ )**

<u>Biomarker<sup>a</sup></u>	<u>n</u>	<u><math>\Delta T_2</math> Plasma</u>	<u>n</u>	<u><math>\Delta T_2</math> Serum</u>
<b>MetS Markers</b>				
Fresh serum $T_2$		n.s. <sup>b</sup>	44	+0.32* <sup>c</sup>
Fresh plasma-Fresh serum $T_2$	43	+0.50***	43	+0.33*
<b>Insulin &amp; Glucose Markers</b>				
Insulin/Insulin C-peptide ratio	43	+0.37*		n.s.
Proinsulin/insulin ratio	42	-0.30*		n.s.
<b>Lipid &amp; Lipoprotein Markers</b>				
TG	43	-0.35*	44	-0.38*
TG/HDL	43	-0.43**	44	-0.39**
TG/TC	43	-0.30*	44	-0.39**
VLDL-C	36	-0.30*	37	-0.41*
LDL/HDL ratio	43	-0.44**		n.s.
HDL-C		n.s.	44	+0.32*
Apo AI		n.s.	37	+0.35*
<b>Inflammation &amp; Blood Cell Markers</b>				
Eosinophil count	43	-0.44**		n.s.
IgM	43	+0.42**		n.s.
<b>Electrolyte Markers</b>				
Cl <sup>-</sup>	42	-0.34*	43	-0.30*
<b>Liver Function &amp; Amino Acid Markers</b>				
GGT	43	-0.42**		n.s.
Sarcosine		n.s.	30	-0.49***
Proline		n.s.	30	-0.40*
<b>Kidney Function Markers</b>				
eGFR	43	+0.40**		n.s.

<sup>a</sup> Correlations were checked against all of the biomarkers listed in Table S3. Only those that had one or more statistically significant Huber correlation coefficients are shown here.

<sup>b</sup> n.s., non-significant ( $p \geq 0.05$ )

<sup>c</sup> \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ , \*\*\*\* $p < 0.0001$

**Table S2 Bivariate Correlations (Pearson, Spearman and Huber) between Frozen Plasma Water T<sub>2</sub> and Metabolic Biomarkers**

<b>Bivariate Correlations Frozen Plasma T<sub>2</sub></b>				
<u>Biomarker</u>	<u>n</u>	<u>r (Pearson)</u>	<u>ρ (Spearman)</u>	<u>M-value (Huber)</u>
Fresh Plasma T <sub>2</sub>	43	0.94*****	0.93*****	0.94*****
Fresh Serum T <sub>2</sub>	44	0.82*****	0.79*****	0.86*****
<b>Insulin &amp; Glucose Markers</b>				
McAuley Index	44	0.69*****	0.69*****	0.75*****
QUICKI	44	0.68*****	0.66*****	0.70*****
FIRI †	44	-0.68*****	-0.63*****	0.68*****
HOMA-IR (insulin c-pep) †	44	-0.67*****	-0.64*****	-0.73*****
HOMA2-IR (insulin) †	40	-0.64*****	-0.58*****	-0.65*****
HOMA2 %S (insulin c-peptide)	44	0.66*****	0.64*****	0.70*****
Insulin †	44	-0.68*****	-0.64*****	-0.67*****
Insulin C-peptide †	44	-0.68*****	0.64*****	-0.75*****
Glucose /Insulin ratio †	44	0.68*****	0.62*****	0.67*****
HbA1C	44	-0.43**	-0.47**	-0.48***
Proinsulin †	43	-0.48**	-0.38*	-0.55***
<b>Protein, Viscosity &amp; Liver Markers</b>				
Total Plasma Protein	42	-0.60*****	-0.61*****	-0.63*****
Plasma globulin	42	-0.69*****	-0.70*****	-0.71*****
Plasma globulin/Albumin ratio	42	-0.57*****	-0.50***	-0.52**
Plasma %Globulins	42	-0.56***	-0.51***	-0.48**
Plasma Viscosity †	43	-0.54***	-0.53***	-0.56*****
Total Serum Protein	43	-0.59*****	-0.64*****	-0.65*****
Serum Globulins	43	-0.55***	-0.55***	-0.62*****
Serum Globulin/Albumin Ratio	43	-0.39**	-0.44**	-0.52***
Serum %Globulins	43	-0.41**	-0.44**	-0.5***
Serum Viscosity, 37	43	-0.56***	-0.57*****	-0.54***
ALT †	43	-0.31*	-0.33*	-0.36*

†Variables that were natural-log transformed in order to meet the normality condition, an assumption inherent to the Pearson correlation.

**Table S2 (continued)**

<b>Lipid &amp; Lipoprotein Markers</b>				
LDL-C	44	-0.61****	-0.62****	-0.61****
IDL †	37	-0.41*	-0.40*	-0.51***
Total cholesterol	44	-0.57****	-0.60****	-0.59****
Triglycerides †	44	-0.47**	-0.48***	-0.53***
Non-HDL cholesterol	44	-0.60****	-0.62****	-0.62****
TG/HDL †	44	-0.40**	-0.41**	-0.48***
Rem-C †	37	-0.41*	-0.36*	-0.52***
ApoB	44	-0.61****	-0.62****	-0.63****
ApoB/Apo A-I ratio	37	-0.49**	-0.54***	-0.59****
LDL-P	44	-0.58****	-0.61****	-0.58****
LDL/HDL †	44	-0.54***	-0.57****	-0.59****
<b>Inflammation, Coagulation &amp; Blood Cell Markers</b>				
WBC †	44	-0.59****	-0.53***	-0.56****
Lymphocyte count	44	-0.48**	-0.46**	-0.6****
C-reactive protein †	44	-0.45**	-0.44**	-0.46**
MCHC	44	0.35*	0.34*	0.42**
Fibrinogen†	44	-0.63****	-0.61****	-0.61****
Complement C3c	41	-0.46**	-0.47**	-0.56****
Complement C4c †	41	-0.45**	-0.45**	-0.50***
α-1 acid glycoprotein †	43	-0.38*	-0.33*	-0.36*
Interleukin 6 †	35	-0.39*	-0.37*	-0.36*
Serine (Ser)	30	0.62***	0.63***	0.69****
Tyrosine † (Tyr)	30	-0.47**	-0.50**	-0.52***
Haptoglobin	42	-0.38*	-0.28	-0.26
Platelet	44	-0.31*	-0.30*	-0.24
Plasminogen Activator Inhibitor †	44	-0.45**	-0.36*	-0.28
<b>Electrolyte Markers</b>				
Lactate	42	-0.49**	-0.44**	-0.57****
Anion Gap, Simple	43	-0.53***	-0.55****	-0.59****
Anion Gap corr for [albumin]	41	-0.45**	-0.42**	-0.44**
Chloride †	43	0.42**	0.47**	0.42**

**Table S3 Bivariate Correlation Coefficients between Frozen Serum Water T<sub>2</sub> and Metabolic Biomarkers**

<b>Bivariate correlations Frozen Serum T<sub>2</sub></b>				
<b>Biomarker</b>	<b>n</b>	<b>r (Pearson)</b>	<b>ρ (Spearman)</b>	<b>M-value (Huber)</b>
Fresh Plasma T <sub>2</sub>	43	0.79****	0.80****	0.79****
Fresh Serum T <sub>2</sub>	44	0.94****	0.93****	0.94****
<b>Insulin &amp; Glucose Markers</b>				
McAuley Index	44	0.67****	0.72****	0.71****
QUICKI	44	0.64****	0.64****	0.65****
FIRI †	44	-0.64****	-0.63****	-0.67****
HOMA-IR (insulin c-pep) †	44	-0.60****	-0.61****	-0.66****
HOMA2-IR (insulin) †	40	-0.59****	-0.55****	-0.64****
HOMA2 %S (insulin c-peptide)	44	0.59****	0.61****	0.61****
Insulin †	44	-0.65****	-0.64****	-0.67****
Insulin C-peptide †	44	-0.60****	-0.62****	-0.68****
Glucose /Insulin ratio †	44	0.65****	0.63****	0.65****
HbA1C	44	-0.35*	-0.38*	-0.42**
Proinsulin †	43	-0.54****	-0.50****	-0.57****
<b>Protein, Viscosity &amp; Liver Markers</b>				
Total Plasma Protein	42	-0.77****	-0.76****	-0.75****
Plasma globulin	42	-0.74****	-0.76****	-0.76****
Plasma globulin/Albumin ratio	42	-0.52****	-0.48****	-0.55****
Plasma %Globulins	42	-0.52****	-0.49****	-0.5****
Plasma Viscosity †	43	-0.58****	-0.62****	-0.65****
Total Serum Protein	43	-0.79****	-0.76****	-0.76****
Serum Globulins	43	-0.64****	-0.65****	-0.73****
Serum Globulin/Albumin Ratio	43	-0.41**	-0.53****	-0.59****
Serum %Globulins	43	-0.44**	-0.53****	-0.57****
Serum Viscosity, 37	43	-0.63****	-0.64****	-0.64****
<b>Lipid &amp; Lipoprotein Markers</b>				
LDL-C	44	-0.58****	-0.55****	-0.59****
IDL †	37	-0.49**	-0.49**	-0.57****
Total cholesterol	44	-0.53****	-0.52****	-0.54****

**Table S3 (continued)**

Triglycerides † (TG)	44	-0.47**	-0.54***	-0.58*****
Non-HDL cholesterol	44	-0.57*****	-0.58*****	-0.62*****
TG/HDL †	44	-0.41**	-0.49***	-0.51***
Rem-C †	37	-0.48**	-0.44**	-0.55***
ApoB	44	-0.57*****	-0.59*****	-0.61*****
ApoB/Apo A-I ratio	37	-0.48**	-0.55***	-0.61*****
LDL-P	44	-0.59*****	-0.60****	-0.62*****
LDL/HDL †	44	-0.52***	-0.57*****	-0.62*****
<b>Inflammation, Coagulation &amp; Blood Cell Markers</b>				
WBC †	44	-0.37*	-0.38*	-0.43**
Lymphocyte count	44	-0.32*	-0.34*	-0.46**
MCHC	44	0.35*	0.35*	0.50***
Fibrinogen†	44	-0.49****	-0.50****	-0.44**
Complement C3c	41	-0.31*	-0.36*	-0.44**
Serine (Ser)	30	0.55**	0.60***	0.55*****
Tyrosine † (Tyr)	30	-0.46*	-0.44*	-0.47**
Glutamate †	30	-0.44*	-0.42*	-0.30*
IgG	44	-0.50****	-0.43**	-0.58*****
<b>Electrolyte Markers</b>				
Lactate	42	-0.45**	-0.49**	-0.56*****
Anion Gap, simple	43	-0.56*****	-0.57*****	-0.60*****
Anion Gap corr. for [albumin]	41	-0.42**	-0.46**	-0.52***
Chloride †	43	0.35*	0.40**	0.37*

†Variables that were natural-log transformed in order to meet the normality condition, an assumption inherent to the Pearson correlation.

**Table S4 Biomarkers Measured in this Study**

<u>Category</u>	<u>Correlation with frozen plasma water T<sub>2</sub><sup>†</sup></u>	<u>No correlation with frozen plasma water T<sub>2</sub><sup>†</sup></u>
<b>Insulin resistance, diabetes &amp; anthropometric markers</b>	fasting insulin, insulin C-peptide, proinsulin, HbA <sub>1c</sub> , HOMA-IR, HOMA2%S, QUICKI, FIRI, G/I ratio, McAuley Index	Glucose, body-mass index, waist circumference, age, resting heart rate
<b>Protein, viscosity liver function &amp; amino acid markers</b>	total serum and plasma protein, serum and plasma globulins, %globulins, viscosity, ALT, GGT, Ser, Tyr	serum and plasma albumin, AST, homocysteine, and 33 other amino acid and amino acid metabolites
<b>Lipid &amp; lipoprotein markers</b>	Total cholesterol, non-HDL-C, LDL-C, LDL-P, VLDL-C, IDL-C, remnant-C, apoB, TG, TG/HDL, apoB/apoA-I ratio, LDL/HDL	HDL-C, HDL <sub>2</sub> , HDL <sub>3</sub> , apoAI, apoE, Lp(a), omega-3 index, DHA, AA, EPA, LpPLA <sub>2</sub> , free fatty acids, phospholipids
<b>Inflammation, acute phase proteins, blood cell &amp; oxidative stress markers</b>	hs-CRP, WBC, neutrophils, lymphocytes, MCHC, fibrinogen, complement C3c, C4c, interleukin-6	RBC, HCT, Hb, MCV, platelets, mean PLT volume, RBC sed. rate, platelet activator inhibitor-1 (PAI-1), ORAC total antioxidant capacity, monocytes, eosinophils, basophils, platelets, haptoglobin, fibronectin, $\alpha$ 2-macroglobulin, transferrin, ceruloplasmin, total iron, TIBC, % iron sat., ferritin, sICAM1, adiponectin, $\alpha$ 1-acid glycoprotein, factor VII, uric acid, neutrophil elastase, endotoxin, staph. enterotoxin, $\alpha$ 1-antitrypsin, IL-10, TNF- $\alpha$ , IL-1 $\beta$
<b>Electrolyte markers</b>	lactate, anion gap, anion gap corrected for albumin, chloride	sodium, potassium, CO <sub>2</sub> (bicarbonate)
<b>Kidney and thyroid markers</b>		BUN, creatinine, eGFR, thyroid stimulating hormone (TSH), free TSH, T4

<sup>†</sup>A correlation is defined as p<0.05 for all three correlation coefficients: Pearson, Spearman, and Huber M-value. For biomarkers in the middle column, the individual coefficients and statistics are provided in Table 1 and Supplementary Tables S1 and S2. A list of abbreviations is provided in the manuscript.