

PERSONAL INFORMATION Simonetta Friso, MD, PhD

PROFESSIONAL ADDRESS  Department of Medicine
 University of Verona School of Medicine
 Section of Immunohaematologic and Haemocoagulative Internal Medicine
 Policlinico "G.B. Rossi", P.le L.A. Scuro, 10
 37134 Verona
 Italy

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Nationality Italian

POSITION TITLE - ASSOCIATE PROFESSOR OF INTERNAL MEDICINE
 - FULL PROFESSOR SCIENTIFIC QUALIFICATION, RATIFIED BY THE NATIONAL SCIENTIFIC COMMITTEE (ASN 2016) SECTOR 06/B1, MED09 INTERNAL MEDICINE

WORK EXPERIENCES

- 2014-present: **Associate Professor of Internal Medicine**, University of Verona School of Medicine (SSD MED/09)
- 2013-present: Coordinator **High Specialization Unit in "Diagnosis and therapy of nutritional disorders"** (Delibera n.452 del 20/6/2013, Prot.n.33637 del 18/7/13).
- 2009-current: Member of the Verona **University Hospital Commission for Scientific Research and Innovation** ("Nucleo Ricerca ed Innovazione", NRI) (n. 585, 11/5/2009, Prot. n. 21240, 19/5/2009)
- 2006-present: **Scientific Chief of the "Epigenomics and gene-nutrient interaction" Laboratory of the University Laboratory for Medical Research, LURM** (<http://lum.it/it/laboratories/>; <http://lum.it/it/staff/?keywords=none&l=epigenetica-e-studio-delle-interazioni-gene-nutrienti>)
- 2005-present: **Physician, Section of Immunohaematologic and Haemocoagulative Disorders, Section of Internal Medicine** (n. 937, 9.06.05, Prot. N. 22177 Tit. VII/6, 24.6.05), **University Hospital, Azienda Ospedaliera Universitaria Integrata Verona**
- 2005-2014: **Assistant Professor of Internal Medicine**, University of Verona School of Medicine (SSD MED/09)
- 2003-2005: **post-doc Fellowship**, University of Verona School of Medicine (SSD MED/09)
- 1998-2001: **Visiting Scientist**, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, MA, USA
- 2001-2003: **Research Associate**, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, MA, USA
- 1991-1996: Internship and residency in Internal Medicine and postgraduate research fellowship, University of Verona School of Medicine (SSD MED/09)
- 1996-1998: Instructor Internal Medicine and Genetics, University of Verona School of Medicine

EDUCATION AND TRAINING

- 1991: **Medical Degree in Medicine and Surgery**, *summa cum laude*, University of Verona School of Medicine
- 1996: **Specialization in Internal Medicine**, *summa cum laude*, University of Verona School of Medicine
- 2002: **PhD in Experimental Haematology**, with *academic mention award*, University of Milan School of Medicine

AWARDS and HONORS

- 2002, International **Hamish N. Munro** Postdoctoral Fellowship Award for outstanding scientific research "Folate Metabolism, Genetics and DNA methylation", **Boston, MA, USA**.
- 2005, Procacci C. Research Scientist Award "Gene-nutrient interactions and epigenetics", **Italy**
- 2006, Director's International Scientific Recognition Award **for Excellence** in scientific impact in "Gene-nutrient interactions and Epigenetics", **Boston, MA, USA**
- 2015, **Award Diet and Cancer RIS for best scientific presentation at EB Experimental Biology FASEB Boston, MA USA**

 PUBLICATIONS AND
BIBLIOMETRIC INDEXES

- **Editor of two invited books** by CRC Press, USA) and author of about **20 book chapters** (by CRC Press, Wiley and Sons, Elsevier Inc.), two *special invited issues* on topics related to Epigenetics, nutrition and gene-nutrient interactions published, on *Molecular Aspects of Medicine*; author of **more than 90 scientific publications in extenso** on **International peer-review Journals** classified by ISI Web of Science among which *The New England Journal of Medicine*, *Proceedings of the National Academy of Sciences, USA*; *Circulation*; *Analytical Chemistry*; *BBA*; *Journal of Medical Genetics*, *Hepatology*.
- ***h-index, as follows:***
 - ISI Web of Science: 36, citations 4690, without self citations 4471
 - Scopus: 36, citations 4937, without self citations 4450
 - Google Scholar: 42; citations 7061; i10-index 82.
- **Enclosed in the Top Italian Scientists list** (<http://www.topitalianscientists.org>)

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
Spanish	C2	C2	C2	C1	C1

Main Research interests

- Epigenetics and gene-nutrient interactions with a special focus on the role of one-carbon nutrients as vitamin B9, B6 and B12 that, as donors of methyl groups, serve for methylation reactions including that of DNA and histones, major epigenetic phenomena in mammalian cells.
- Study of the effects of B vitamins and gene-nutrient interactions on epigenetic mechanisms by using different cell culture and animal models as well as studies in humans.
- Expertise in genetic- and epigenetic-focused methods, the latest mainly in the area of DNA methylation by setting up novel methods for to the analysis of DNA methylation patterns both global and gene-specific and also by through high-throughput array-based techniques
- Studies on the interactions between polymorphisms within one-carbon metabolism genes and epigenetic phenomena in humans for studies focused on chronic illnesses including cardiovascular diseases and cancer with an attention to primary liver cancers.

ADDITIONAL INFORMATION

Publications

Main scientific publications in extenso during the last five years on peer-reviewed Journals classified by ISI web of Science:

Olivieri O, Turcato G, Moruzzi S, Castagna A, Girelli D, Pizzolo F, **Friso S**, Sandri M, Bassi A, Martinelli N. Not Just Arterial Damage: Increased Incidence of Venous Thromboembolic Events in Cardiovascular Patients With Elevated Plasma Levels of Apolipoprotein CIII. *J Am Heart Assoc*. 2019 Jan 22;8(2):e010973. doi: 10.1161/JAHA.118.010973.

Udali S, De Santis D, Ruzzenente A, Moruzzi S, Mazzi F, Beschin G, Tammen SA, Campagnaro T, Pattini P, Olivieri O, Guglielmi A, Choi SW, **and Friso S**. DNA Methylation and Hydroxymethylation in Primary Colon Cancer and Synchronous Hepatic Metastasis. *Front Genet. Epigenetics* 2018 Jan 9;8:229. doi: 10.3389/fgene.2017.00229.

Udali S, Castagna A, Corbella M, Ruzzenente A, Moruzzi S, Mazzi F, Campagnaro T, Santis D, Franceschi A, Pattini P, Gottardo R, Olivieri O, Perbellini L, Guglielmi A, Choi SW, Girelli D, **and Friso S**. Hepcidin and DNA promoter methylation in hepatocellular carcinoma. *Eur J Clin Invest*. 2018 Feb;48(2). doi: 10.1111/eci.12870. Epub 2017 Dec 28.

Moruzzi S, Guarini P, Udali S, Ruzzenente A, Guglielmi A, Conci S, Pattini P, Martinelli N, Olivieri O, Tammen SA, Choi SW, **and Friso S**. . One-carbon genetic variants and the role of MTHFD1 1958G>A in liver and colon cancer risk according to global DNA methylation. *PLoS One*. 2017 Oct 2;12(10):e0185792. doi: 10.1371/journal.pone.0185792.

Friso S, Udali S, De Santis D, Choi S-W "One carbon metabolism and epigenetics" [Epub ahead of print]: *Mol Aspects Med*. 2017 Apr;54:28-36. doi: 10.1016/j.mam.2016.11.007. Epub 2016 Nov 19. pii: S0098-2997(16)30093-0. doi: 10.1016/j.mam.2016.11.007. PMID: 27876555

Lee J, Kim Y, **Friso S**, Choi S-W. "Epigenetics in non alcoholic fatty liver disease" *Mol Aspects Med*. 2017 Apr;54:78-88. doi: 10.1016/j.mam.2016.11.008. Epub 2016 Nov 23. pii: S0098-2997(16)30090-5. doi: 10.1016/j.mam.2016.11.008. PMID: 27889327

Tammen SA, Park LK, Dolnikowski GG, Ausman LM, **Friso S**, Choi SW. Hepatic DNA hydroxymethylation is site-specifically altered by chronic alcohol consumption and aging. *Eur J Nutr*. 2017 Mar;56(2):535-544. doi: 10.1007/s00394-015-1098-4.

Friso S, Pizzolo F, Udali S, Guarini P, Castagna A, Consoli L, Salvagno G, Tinazzi E, Pattini P, Choi S-W, Lunardi C, Olivieri O. "Epigenetic Regulation of HSD11B2 Gene by Promoter Methylation in Glucocorticoid-Treated Patients" 2016 *Journal of Clinical Epigenetics*, Vol.2, No: 1:1-12 <http://clinical-epigenetics.imedpub.com/epigenetic-regulation-of-hsd11b2-gene-by-promoter-methylation-in-glucocorticoid-treated-patients.php?aid=8369>

Tammen SA, Park JE, Shin PK, **Friso S**, Chung J, Choi SW. Iron Supplementation Reverses the Reduction of Hydroxymethylcytosine in Hepatic DNA Associated With Chronic Alcohol Consumption in Rats. *J Cancer Prev*. 2016 Dec;21(4):264-270. doi: 10.15430/JCP.2016.21.4.264.

Moruzzi S, Udali S, Ruzzenente A, Guglielmi A, Guarini P, Martinelli N, Conci S, Mazzi F, Pattini P, Tammen SA, Olivieri O, Pizzolo F, Choi SW, **and Friso S**. The RFC1 80G>A, among Common One-Carbon Polymorphisms, Relates to Survival Rate According to DNA Global Methylation in Primary Liver Cancers. *PLoS One*. 2016 Dec 9;11(12):e0167534. doi:10.1371/journal.pone.0167534

Pizzolo F*, **Friso S***, Morandini F, Antoniazzi F, Zaltron C, Udali S, Gandini A, Cavarzere P, Salvagno G, Giorgetti A, Speziali G, Choi SW, Olivieri O. Apparent Mineralocorticoid Excess by a Novel Mutation and Epigenetic Modulation by HSD11B2 Promoter Methylation. *J Clin Endocrinol Metab*. 2015 Sep;100(9):E1234-41. doi: 10.1210/jc.2015-1760. Epub 2015 Jun 30. PMID:26126204. *First coauthorship

Udali S, Moruzzi S, Ruzzenente A, Choi SW, **and Friso S**. Hypomethylation and hypohydroxymethylation of DNA in hepatocellular carcinoma and cholangiocarcinoma" Reply to Li, Zhi et al. *Hepatology*. 2015 Oct 5. doi: 10.1002/hep.28271. PMID: 26439221

Udali S, Guarini P, Moruzzi S, Ruzzenente A, Tammen S, Guglielmi A, Pattini P, Campagnaro T, Conci S, Olivieri O, Corrocher R, Choi S-W, **and Friso S** "Global DNA methylation and hydroxymethylation status differ in hepatocellular- and cholangiocarcinoma and relate to survival rate" *Hepatology*, Aug;62(2):496-504. doi: 10.1002/hep.27823. Epub 2015 Apr 28.

Udali S, Guarini P, Ruzzenente A, Ferrarini A, Guglielmi A, Lotto V, Tononi P, Pattini P, Moruzzi S, Campagnaro T, Conci S, Olivieri O, Corrocher R, Delledonne M, Choi S-W, and Friso S. DNA methylation and gene expression profiles show novel regulatory pathways in hepatocellular carcinoma. *Clinical Epigenetics*, 2015, 7:43 DOI: 10.1186/s13148-015-0077-1. PMID: 25945129.

Choi S-W, Tammen SA, Liu Z, and Friso S. A lifelong exposure to a Western style diet, but not aging, alters global DNA methylation in mouse colon. *Nutrition Research and Practice*, 2015 Aug;9(4):358-63. doi: 10.4162/nrp.2015.9.4.358. PMID: 26244073

Marchetti G, Girelli D, Zerbini C, Lunghi B, Friso S, Meneghetti S, Coen M, Gagliano T, Guastella G, Bochaton-Piallat ML, Pizzolo F, Mascoli F, Malerba G, Bovolenta M, Ferracin M, Olivieri O, Bernardi F, Martinelli N. "An integrated genomic-transcriptomic approach supports a role for the proto-oncogene BCL3 in atherosclerosis". *Thromb Haemost.* 2015 Mar;113(3):655-63. doi: 10.1160/TH14-05-0466. PMID: 25374339.

Tammen SA, Dolnikowski GG, Ausman LM, Liu Z, Kim KC, Friso S, Choi SW. "Aging alters hepatic DNA hydroxymethylation, as measured by liquid chromatography/mass spectrometry". *Journal of Cancer Prevention* (pISSN: 2288-3649; eISSN: 2288-3657; website: <http://www.jcpjournal.org>) J Cancer Prev. 2014 Dec;19(4):301-8. doi: 10.15430/JCP.2014.19.2.301. PMID: 25574465

Lee JH, Friso S, Choi S-W. "Epigenetic mechanisms underlying the link between non-alcoholic fatty liver diseases and nutrition" *Nutrients* 2014, 6, 3303-3325; doi:10.3390/nu6083303

Tammen, S., Dolnikowski, G., Ausman, L., Liu, Z., Sauer, J., Friso, S., and Choi, S-W. "Aging and alcohol interact to alter hepatic DNA hydroxymethylation" *Alcohol Clin Exp Res.* 2014 Jul 28. doi: 10.1111/acer.12477. [Epub ahead of print] PMID: 25070523

Friso S., Carvajal C.A., Fardella C.E., Olivieri O. "Epigenetics and arterial hypertension: the challenge of emerging evidence." *Translational Research* 2014 Jun 25. pii: S1931-5244(14)00214-X. doi: 10.1016/j.trsl.2014.06.007. PMID:25035152

Bacalini MG, Friso S, Olivieri F, Pirazzini C, Giuliani C, Capri M, Santoro A, Franceschi C, Garagnani P. "Present and future of ageing epigenetic diets". *Mech Ageing Dev.* 2014 Jan 2. 2014 Mar-Apr;136-137:101-15. pii: S0047-6374(13)00136-X. doi: 10.1016/j.mad.2013.12.006. Epub 2014 Jan 2.

Moruzzi S, Girelli D, Olivieri O. and Friso S. "An Unusual Case of Acute Abdominal Pain," Volume 2013 (2013), Article ID 7488' *International Journal of Case Reports in Medicine* (ISSN: 2327-3542).

Olivieri O, Martinelli N, Baroni M, Branchini A, Girelli D, Friso S, Pizzolo F, and Bernardi F. Factor II activity is similarly increased in patients with elevated apolipoprotein CIII and in carriers of the factor II 20210A allele. *J Am Heart Assoc.* 2013 Nov 15;2(6):e000440. doi: 10.1161/JAHA.113.000440.

Friso S, Udali S, Guarini P, Pellegrini C, Pattini P, Moruzzi S, Girelli D, Pizzolo F, Martinelli N, Corrocher R, Olivieri O, and Choi S. "Global DNA hypomethylation in peripheral blood mononuclear cells as a biomarker of cancer risk" *in press, Cancer Epidemiol Biomarkers and Prevention* 2013 Jan 8. [Epub ahead of print, Published OnlineFirst January 8, 2013] *Cancer Epidemiol Biomarkers Prev* 2012; doi:10.1158/1055-9965.EPI-12-0859 PMID: 23300023

Choi SW, Claycombe KJ, Martinez JA, Friso S, Schalinske KL. Nutritional epigenomics: a portal to disease prevention. *Adv Nu* 2013 Sep 1;4(5):530-2. doi: 10.3945/an.113.004168.

Udali S, Guarini P, Moruzzi S, Choi S-W, and Friso S. "Cardiovascular epigenetics: from DNA methylation to microRNAs" *Invited Special Issue on Epigenetic mechanisms in Nutrition, Cancer and Cardiovascular Diseases in Molecular Aspects of Medicine* Mol Aspects Med. 2013 Jul-Aug;34(4):883-901. doi: 10.1016/j.mam.2012.08.001. Epub 2012 Sep 6. PMID: 22981780

Tammen SA, Friso S, and Choi S-W. "Epigenetics: the link between nature and nurture", *Invited Special Issue on Epigenetic mechanisms in Nutrition, Cancer and Cardiovascular Diseases in Molecular Aspects of Medicine*, 2013 Jul-Aug;34(4):753-64 10.1016/j.mam.2012.07.018. Epub 2012 Aug 10. PMID:22906839 (*Molecular Aspects of Medicine's top 5 most cited article 2014*: <http://www.journals.elsevier.com/molecular-aspects-of-medicine/special-issues>)

Projects

Scientific chief for National and International research projects:

- *PI or co-PI for international research projects funded by NIH (RO1, R21), Fondecyt, Conicyt, Bayer Healthcare, SOCHED and Natinal such as PRIN, Fondazione Cariverona, Joint Project, Basic Science project, all of them based on peer-review processing;*

- Scientist director for research projects and covered teaching positions for a consecutive timeline of at least four years at the Jean Mayer, HNRC at Tufts University Boston, MA, USA e Friedman School of Nutrition Science and Policy Boston, MA USA;

- Several National and International Collaborative research projects ongoing (in particular USA, Chile, Korea, Germany, the Netherlands).

Editorial Board memberships

- Associate Editor per Journal "Frontiers in Nutrition",

- Editorial Board Member di *Journal of Cancer Prevention* (indexed in the PubMed Central archive, National Library of Medicine (NLM), and Google Scholar),

- Editorial Board member della sezione di *Nutrigenomics di "Frontiers in Genetics" (censito in Scopus);*

- Board of Reviewers' Member of "BioFactors" Journal (censito in Scopus e WOS);

- Editorial Advisory Board of the Journal "Epigenetics of Diabetes and Obesity",

- Editorial Board Member, Review Editor di "Frontiers in Cell and Developmental Biology" Section Epigenomics and Epigenetics

Teaching activities in National and International PhD programs

- **PI and co-PI for research projects by International Institutions granted after a peer-reviewed process:**

- **NIH** (Bethesda, USA: NIH/NIAAA, R21- AA016681-01; R01-AG025834-01A2),

- **Fondecyt & Conicyt (EMBC/EMBO co-operation partner, Chile: grant#1130427, 1150437, 1160695),**

- **SOCHED**

- Bayer Healthcare

- PI and co-PI as well as collaborator for several National project funded by **and National Institutions** including Italian Ministry as **PRIN**, Cariverona Foundation (PI), Joint Project (PI), Basic Science (coPI);

Invited speaker

- **Scientific director** of research projects including teaching within post-graduate PhD courses at the International center Jean Mayer, HNRC at Tufts University **Boston, MA, USA** e Friedman School of Nutrition Science and Policy Boston, MA USA;

- Several ongoing collaborative projects with International research groups in USA, Korea, Chile, Germany, the Netherlands.

Professional memberships

- Associate Editor for the Journal "Frontiers in Nutrition" (indexed by Scopus and WOS);

- Editorial Board Member *Journal of Cancer Prevention* (indexed in the PubMed Central archive, National Library of Medicine (NLM), and Google Scholar),

- Editorial Board member *Nutrigenomics "Frontiers in Genetics" (indexed by Scopus);*

- Board of Reviewers' Member of "BioFactors" Journal (indexed by Scopus and WOS);

- Editorial Advisory Board of the Journal "Epigenetics of Diabetes and Obesity",

- Editorial Board Member, Review Editor of "Frontiers in Cell and Developmental Biology" Epigenomics and Epigenetics Section

Reviewer for Journals and for International Scientific evaluation Committees for grant assignment of research project applications

Teaching colleges permanent member for **PhD programs in Italy:**

- Member PhD programs of the Italian Ministry of the University and Scientific research:

- *Biomolecular Medicine* DOT1340243 (University of Verona) from 2013-at present; course program: 3 years

- *Clinical Proteomics* DOT0340337 (University of Verona) from 2006-2012 including Cycles: from XXII to XXVIII- course program: 3 years

- *Experimental Haematology* DOT06C6974 (National University of Milan Bicocca) from 2007-2012. Cycles: from XXIII to XXVIII. course program 4 years

- Professor at PhD course at Friedman School of Nutrition Science and Policy, Tufts University, **Boston, MA, USA** (2009 -)

Invited speaker at a large number of national and International Conferences either in Italy, other European countries as France, Germany, UK, Ireland) as well as in the USA, Korea, Chile.

2000-2012 Member, the *American Heart Association*, Council on Atherosclerosis, thrombosis and vascular biology, U.S.A.

2001-present Member, the *Epigenetics Society* (formerly *DNA Methylation Society*), U.S.A.

2007-present Member, *Italian Society of Internal Medicine*, Italy

2009-present Member, College of the *University Professors of Internal Medicine Italian Society*, Italy

2011-present Member, the *American Society for Nutrition*, Diet and Cancer and Gene-Nutrient Interactions group member,

U.S.A.

2012 -present Member of the Biochemical Society Advancing Molecular Bioscience, UK

- reviewer for an ample number of major International peer-review Journal indexed by ISI Web of Science among which: The New England Journal of Medicine,

- reviewer ad hoc for research project for grant applications:

2015-: ESRC (Economic and Social Research Council), UK

2015-: MRC, Medical Research Council, UK

2014-: The Netherlands Organisation for Scientific Research, (Div. Earth and Life Sciences)

2014- : Wellcome Trust, London, UK

2014- : National Science Centre, (Narodowe Centrum Nauki), Poland

2013-: BBSRC (Biotechnology and Biological Sciences Research Council), UK

2013- *European Science Foundation EMBO*

2008-: The Technology Foundation STW (Utrecht, The Netherlands)

2006- : INSERM ("Institut national de la santé et de la recherche médicale")

2004-present: MIUR, Italian Ministry for University and Scientific Research

2018-present: International Scientific Evaluation Committee for the JPI HDHL

Organisational/managerial/job-related skills

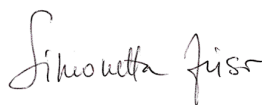
Experience of coordinator of several research projects either at a National and International level

Use of Office software packages in Windows system and Apple Mac, Statistical package by using IBM SPSS software.

PATENTS

Inventor and owner of **INTERNATIONAL PATENT** for the invention of "A method to assess genomic DNA methylation using high-performance Liquid Chromatography-Electrospray Ionization Mass Spectrometry" (Priority data: 60/400,756; Pub. No.: WO/2004/013284 International Application No: PCT/US2003/023212 Publication Date:12.02.2004; International Filing Date:25.07.2003,USA).

I authorize the treatment of personal data according to Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali (facoltativo)"

SignatureVerona, February 25th 2019