

Course description

Dietary Sciences

PROGRAM

To know the techniques and methods of semiotics and to define the state of health and risk of disease, according to the nutritional status. To know the indicators of nutritional risk predictors of disease. To know the role of diet in the prevention of chronic degenerative diseases. To know the principles of artificial nutrition: enteral and parenteral nutrition. To know the principles of nutrigenetics and nutrigenomics.

SUBJECTS

Assessment of nutritional status and energy requirements. Principles of diet therapy. Nutrition and non communicable diseases. Principles of nutritional genomics.

1) Assessment of nutritional status and body composition

1.1 Family and individual history;

1.2 Anthropometric measurements; anthropometric measures:

- Measurement of weight (kg), height (cm) for calculating the BMI=body weight (Kg)/height (m)²:

1.3 Determination of water compartments with methodical BIA (bioelectrical impedance): Resistance, reactance, impedance and phase angle at 50 kHz frequency were measured using a BIA phase sensitive system

1.4 Assessment of body composition:

1.4.1 Measurement tricipitale folds, iliac and subscapular (Plicometry)

1.4.2 Evaluation of body composition by DXA (dual energy X-ray absorbimetry) (i-DXA, GE Medical Systems, Milwaukee, WI, USA): determination of levels of total body lean mass (TBLearn), total body fat mass (TBFat) and total body bone mass (TBBone): Appendicular Scheletar Muscle Mass Index determination;

1.3 Nutritional survey of dietary habits (Food Frequency Questionnair, Simplified Nutritional Appetite Questionnaire, i.e. SNAQ questionnaire);

1.4 Determination of energy expenditure (indirect calorimetry): respiratory quotients, basal metabolism, energy expenditure;

1.5 Assessment of psychological profile and eating behaviour

2) Nutrigenetic and Nutrigenomic:

2.1 Role of genetic polymorphisms in the cross-talk between adipose tissue, muscle tissue and bone to evaluate the risk of obesity, sarcopenia, osteoporosis, metabolic syndrome, cardiovascular diseases.

2.2 Assessment of gene expression of gene related to obesity, sarcopenia, osteoporosis, cardiovascular diseases, inflammation and oxidative stress.

3) definition of phenotypes:

3.1 Normal weight lean

3.2 Normal weight obese, with or without metabolic syndrome

3.3 Obese, with or without metabolic syndrome

4) Dietary treatment for a personalized medicine

Food Chemistry (5 CFU)

Program of the course

Foods: main composition in terms of proteins, fats and carbohydrates. Food energy as calories.

Food safety and food security: Nutrient and Hazard analysis and critical control point.

Microbial, chemical and physical hazard. Chemical preservatives. Dimethoate and Glyphosate. Foods and their conservation. The mechanism of alteration. Water activity: the role of water in food conservation. pH and Temperature control.

The peroxidation process.

The bioactive compound of the Mediterranean Diet. The Mediterranean Adequacy Index.

The Nutritional Quality Indexes.

The composition of olive oil. Fats, butter, oil and hydrogenated fats.

The composition of wine, and effects on human health.

The composition of tomato, and effects on human health.

The composition of nut (hazelnut and chestnut), and effects on human health.

The composition of chilly pepper, and effects on human health.

The composition of cocoa, and effects on human health.

Western Diet and dependence; sugar, salt and fat.

Role of antioxidant in organic compound, and effects on human health.

Microbiota and role of probiotics.

Fibers in foods. Starch and cellulose. Amilose and amilopectin. Structure and hydration properties.

The browning of foods and the Maillard reaction: Enzymatic browning. Browning by caramelization. The Maillard reaction. The Amadori products. The reaction mechanism.

Nutritional consequences of the Maillard reaction. The melanoidins.

Aromatic amines from roasted meat and their mutagenicity.

Ames test. Acrolein production in deep frying. Acrylamide in potatoes.

Additives: gelificants, thickeners and emulsifiers. Natural or synthetic sweeteners. The supercritical viscosity (ketchup). Emulsions and foams and their evolution upon time.

TEXBOOK:

Didactic material will be provide to the student.

Lecturer

Prof. Laura Di Renzo

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Receiving Hours: by appointment (please contact by e-mail)

Curriculum Vitae

Department of Biomedicine and prevention, Section of Clinical Nutrition and Nutrigenomic, University of Rome Tor Vergata, Rome Italy

Prof. Laura Di Renzo, graduated in Pharmacy, in Human Nutrition Science, specialized in Food and Nutrition Science, she has a Philosophy doctoral (PhD) in Molecular and Cellular Biology.

From 1987 to 1990 she worked as a follower Department of Human Biopathology, University of Rome "La Sapienza"; the research carried out during this period was focused on: a) the characterization of X-Ray effects on the differentiation of L5 myoblast cell line; b) the susceptibility to X-Ray damage and repair during in vitro myogenesis; c) the role of DNA methylation in the differentiation of L5 myoblast cell line.

From 1991 to 2002 she worked as a researcher at the Molecular Biology Research Institute, IRBM, Pomezia, Italy. The research activity performed at I. R. B. M. concerned the development of cell-based assays and automatized in vitro assays for large scale random screening of chemical compounds with potential pharmacological activity on pathologically relevant targets such as HBV polymerase, HCV (Hepatitis C virus) protease and HIV-Reverse transcriptase; study of Hepatitis B Virus polymerase, Hepatitis C virus NS3-protease, RNA dependent RNA polymerase of HCV (RdR pol), and HIV-1 Reverse transcriptase (HIV-RT). From 2004 to 2009 she was researcher at the Division of Human Nutrition, Faculty of Medicine of University of Tor Vergata .

Since 2010 she is senior researcher, and since 2014 she is Aggregated Professor and at Division of Clinical Nutrition and Nutrigenomic, Department of Biomedicine and prevention at the University of Tor Vergata, Rome, Italy. The research activity carried out in this period concerned the study of human body composition and correlations with gene expressions.

Since 2005 she has set up a molecular biology laboratory, for nutrigenetic and nutrigenomic studies. She is coordinating various national research projects in this area.

She has specialized in: a) nutritional genomic (Nutrigenetic and Nutrigenomic); b) human body composition and correlations with gene expressions and Single Nucleotide Polymorphisms (SNPs) of obesity related genes.

Since 2012 she coordinates the Research and Experimentation Group of the Medicinal Plants chain at Ministry of Agriculture Food and Forestry (20/12/2013, n. 0066562).

She is Nominated as Scientific Expert at Ministry of Agriculture Food and Forestry of: 1) the Organic Agriculture Sector Group "EG_Bio.", Ministry of Agriculture Food and Forestry (06/12/2013 n. 18180); 2) the Technical and Scientific Research Office, General Directorate for Rural Development DISR IV, for the reform of rural development for the programming period 2014 to 2020-Research and Innovation in agriculture food and forestry, Ministry of Agriculture Food and Forestry (10/18/2013 n. 0020214); 3) Territorial marketing and multifunctionality Group of Nut Chain.

She is Scientific Expert of: 1) the Organic Agriculture Sector Group "EG_Bio.", Ministry of Agriculture Food and Forestry (06/12/2013 n. 18180); 2) the Technical and Scientific Research Office, General Directorate for Rural Development DISR IV, for the reform of rural development for the programming period 2014 to 2020-Research and Innovation in agriculture food and forestry, Ministry of Agriculture Food and Forestry (10/18/2013 n. 0020214). She is component of the Executive Council of the Center of Training, Upgrading and Promoting Health Professions (CIFAPPS), University of Rome Tor Vergata (R.D. n.1844 of 05/06/2013). She is component of the EXPO 2015 Advisory Committee of the University of Tor Vergata, Rome, Italy.

Editorial activity:

Publisher of electronic multidisciplinary magazine: "PATTO in Magazine" , the magazine registered information to the Court of Rome Press No. 151 of July 11, 2016.

Component of Editorial Board of Biomedicine and Prevention, section: Nutrition

Component of Editorial Board of Journal Traslational Medicine, section: Nutrition & Metabolism

Component of Editorial Board of Eating and Weight Disorders Journal

Component of Editorial Board of Rivista di Patologia dell'Apparato Locomotore , della Società Italiana di Patologia dell'Apparato Locomotore (SIPAL), dal Novembre 2011

Component of Editorial Board of: “OLOS. AREA LINGUAGGI E COMUNICAZIONE”. Ed. UniversItalia Roma

Publications

Prof. Di Renzo is author of > 70 articles in international peer reviewed journals and 12 publications including books chapter and educational publications.