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Nicotinamide adenine dinucleotide-dependent automodification of poly (ADP-ribose) polymerase and membrane lipid composition: How to link diet intake to the physio-pathological state of the cell

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Bioactive dietary components are signalling molecules that carry information from the external environment and affect in terms of quantity and quality the process of gene expression. The processes of DNA synthesis and repair are regulated by macro-/micro-elements and by some of vitamins. Vitamin B3 (niacin) is the precursor of Nicotinamide Adenine Dinucleotide (NAD⁺), involved as coenzyme in metabolic oxido-reductive processes. NAD⁺ is also substrate of enzymes synthesizing signaling compounds and reversibly modifying protein. One such modification is poly(ADPribosyl)ation, catalysed by poly (ADPribose) polymerases (PARPs), affecting many cellular events. Nuclear PARP1 and PARP2 are hyperactivated by DNA strand-breaks, auto-modify with large polymers of ADPribose and recruit DNA repair proteins. As many DNA breaks are as much PARP automodifies. On the other hand, dietary lipids can be signalling molecules, lead to pro-(ω 6)/anti-(ω 3) inflammatory compounds, and be included in biomembranes, good biomarkers of their unbalance. Here results obtained detecting auto-modified PARP levels, analysing membrane lipid composition (Fat Profile) and statistically evaluating their possible correlation with lifestyle, diet and diseases is reported. The research was carried on with 70 subjects who were recruited and interviewed, to collect anamnesis and clinical data, if present. Lymphocytes and erythrocytes were prepared from venous blood to assay PARP auto modification and lipid content, respectively.

Biography

Maria Rosaria Faraone Mennella is Associate Professor of Biochemistry at the Department of Biology, University of Naples "Federico II", Naples, Italy. She is group leader and head of the laboratory for research on poly-AD Pribosylation reaction and oxidative stress. She has published in reputed journals and has been serving as a managing editor and reviewer of international scientific journals.

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