



UNIVERSITÀ
DEGLI STUDI
DI PALERMO

Dottorato di Ricerca in Biomedicina e Neuroscienze

Coordinatore: Prof. Felicia Farina

Sede Amministrativa: Dipartimento di Biomedicina Sperimentale e Neuroscienze Cliniche

Direttore: Prof. Giuseppe Ferraro

AVVISO DI SEMINARIO

Martedì 30 Gennaio 2018, ore 11:00

Aula "E. Nesci", Sezione di Anatomia Umana

Dipartimento di Biomedicina Sperimentale e Neuroscienze Cliniche

Via del Vespro 129, Palermo

Maciej Wnuk, PhD, DSc

Department of Genetics, of Biotechnology, University of Rzeszow, Poland

The role of methyltransferase DNMT2/TRDMT1 in cellular senescence

Abstract of the talk:

Human DNMT2/TRDMT1 is the most conserved protein belonging to DNA methyltransferase family of proteins with numerous homologs in plants and animals. The biological significance of DNMT2 still remains elusive. Recently, our research group has found that DNMT2/TRDMT1 methyltransferase is responsible for maintaining cellular genomic integrity, including telomere length maintaining. We have shown that CRISPR-based Dnmt2 silencing in NIH3T3 cells resulted in telomere shortening with decreased telomerase activity. Surprisingly, telomerase activity was correlated with the level of Dnmt2 silencing without to change the levels of telomere protein complex (Trf1, Trf2, Rap1 and Pot1). Dnmt2 silencing also promoted DNA damage and genomic instability, a decrease in proliferative potential and an elevation in the levels of senescence-associated beta-galactosidase positive cells. Moreover, we have successfully silenced the levels of DNMT2 using CRISPR/Cas9 system in HeLa cancer cells showing a significant shortening of telomeres, change in the levels of gene regulating cell cycle progression and promoting micronuclei formation as well as global chromosome aberrations. Obtained results might shed light on molecular mechanisms responsible for secondary chromosome changes and cellular heterogeneity within cell subpopulations that lead to premature senescence-related diseases and cancer development.

***Brief biosketch:**

Maciej Wnuk, PhD in Molecular Cytogenetics is a Professor in the Department of Genetics, of Biotechnology, University of Rzeszow, Poland. His interests are in the field of Cell Biology and Cancer Research with special reference to cellular senescence, nucleolus biology, molecular toxicology, and nanotoxicology.