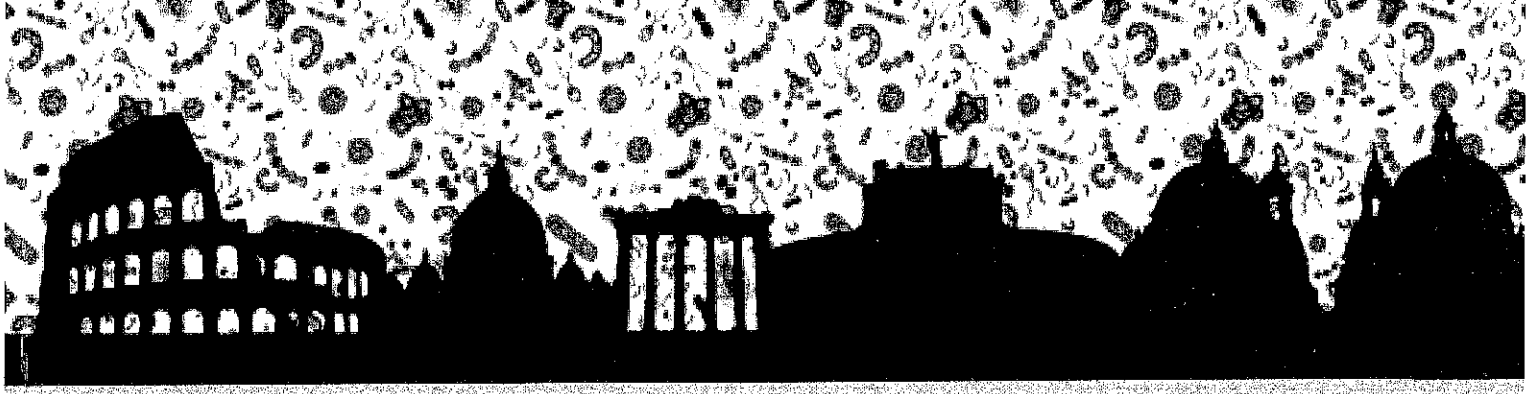
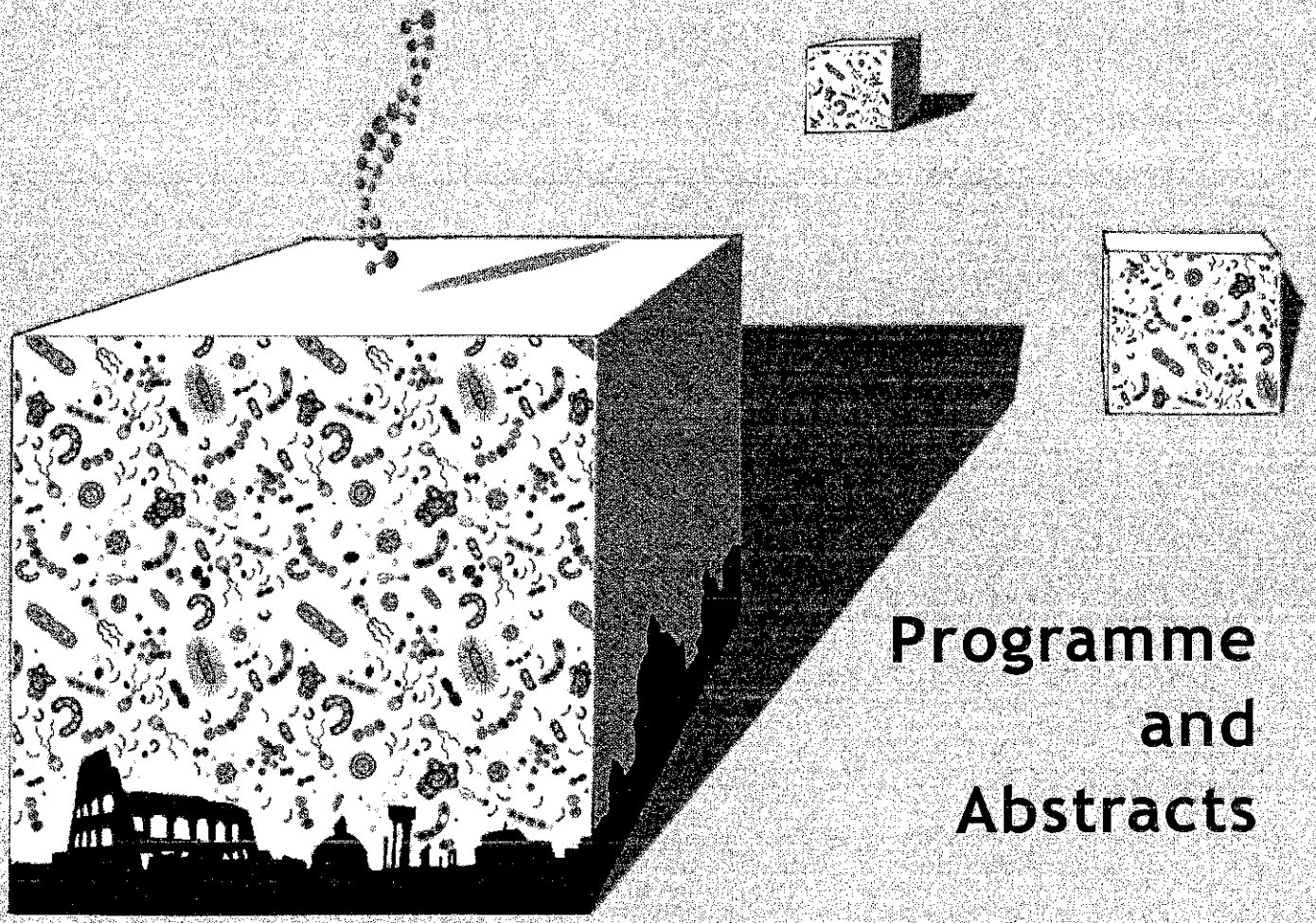


AAI ABCD AGI SIB SIBBM SIBE SIBV SIC SICA SIF SIGA SIMA SIMGBM SIP SIPaV



Programme
and
Abstracts

XIV FISV CONGRESS

Rome, September 20th-23rd, 2016

Sapienza University of Rome

P11.5
Silica nanoparticles and ozone: an evaluation of their *in vitro* cytotoxicity and genotoxicity in a experimental model of indoor air

A.M.G. Poma[1], S. Colafarina [1], O. Zarivi [1], A. Bonfigli[1], A. Di Serafino[1], M. Gambacorta[1], L. Arrizza[4], E. Aruffo[2] , P. Di Carlo[2,3]
[1]Dip. Medicina Clinica, Sanità Pubblica, Scienze della Vita e dell'Ambiente, Lab. Genetica e Mutagenesi, Università dell'Aquila, Via Vetoio 1, Coppito, L'Aquila, [2]CETEMPS-Dip. Scienze Fisiche e Chimiche, Università dell'Aquila, L'Aquila, [3]Dip.Scienze Psicologiche della Salute e del territorio, Università "G. d'Annunzio" di Chieti-Pescara, via dei Vestini, 31, Chieti, [4]Centro di Microscopie, Università dell'Aquila

Several studies point out the effects on health of indoor air pollutants, i.e. nanoparticles (NPs) containing black carbon, silica and gases like ozone (O_3). The work is a multidisciplinary study of the potential cyto-genotoxicity of silica NPs and O_3 in *in vitro* cell systems. We analyzed cell lines A549 (human lung epithelial cells) and HS 27 (human fibroblasts) exposed under dynamic conditions by a simulator IRC under the stream of ozone and silica NPs (about 40µg/h). A549 do not show a significant difference in viability (MTT test) in the presence of ozone at 48 and 72 h but an increase of 30-40% of cell death in the presence of silica NPs and silica NPs/ozone. HS27 showed a viability reduction of 10-15 % at 48 and 72 h either in the presence of ozone, silica NPs and silica NPs/ ozone. Micronuclei show an increase of 45 % in A549 and 35% in HS 27 in the presence of ozone, silica NPs and silica NPs/ozone. The comet test shows a 40% increase of the Tail Moment in both lines in the presence of silica NPs and silica NPs/ozone. Final output will be a picture of the role of silica NPs/ozone in the indoor air quality taking into account the potential simultaneous co-toxicant action.

P11.6
Characterization of telomere length and telomerase activity in iPS cells and the relationship with chromosome instability

S. Turturro[1], B. Kuebler[2], A. Raya[2], A. Sgura[1]
[1]Dept. Of Science Roma Tre University, viale marconi,446 – 00146 Rome, Italy, [2]Center for Regenerative Medicine in Barcelona, Dr Aiguader ,88 - 08003 Barcelona, Spain

Induced Pluripotent Stem cells (iPSCs) are derived by adult differentiated cells by Yamanaka's retrovirus transduction; after reprogramming, this cells are totally similar to embryonic stem cells (ESCs). Telomeres are heterochromatic region that caps chromosome end and telomerase is responsible to maintain their length. We know that in mouse, telomerase activity is essential to maintain self-renewal ability of iPSCs, telomere and karyotype stability, while its absence does not prevent colony formation but with an increase of chromosome instability (CIN). Therefore, in human, there is the need to better investigate on this cells because if telomerase is not active enough, clones could be more susceptible to CIN. With this aim we test for telomere length, telomerase and CIN in iPSCs derived from human fibroblasts. Our data show that in our iPSCs samples telomeres are elongated respect to the original fibroblasts and they became longer during subsequent passages, until they reach ESCs telomeres length. In fact preliminary results obtained from TRAP assay indicated a telomerase activity in these cells. Due to the role of telomere in chromosome stability, also the CIN will be evaluated.

P11.7
Effects of telomerase inhibitor Epigallocatechingallate on human glioblastoma cells

I. Udroiu, J. Marinaccio, A. Sgura
Dept. of Sciences, Università "Roma Tre", Rome, Italy

Epigallocatechingallate (EGCG) is the major polyphenol in green tea, with known anticancer features, such as anti-oxidative and anti-angiogenetic properties, regulation the molecular pathway of the cell cycle and signal transduction. Moreover, it is also well known as telomerase inhibitor. In this work, we have chronically treated with EGCG glioblastoma cells (U251) for 100 days with low, pharmacologically appropriate concentrations, in order to investigate its effects both on telomeres and on genome integrity. Inhibition of telomerase activity caused telomere shortening, ultimately leading to senescence and telomere damage after 100 days. Interestingly, we have observed DNA damage through an increase of micronuclei, nucleoplasmic bridges and phosphorilation of γ-H2AX histone, also when telomere shortening was not present. Therefore, we concluded that this genotoxic damage was not correlated with telomere shortening and that EGCG chronic treatment induced not only an increase of telomere-shortening-induced senescence, but also genotoxicity. Thus, DNA damage induced by EGCG raises serious concerns for its application in cancer therapy

P11.8
Evaluation of mutagenic/genotoxic effect of $PM_{0.5}$ collected in five italian towns in two seasons: results of the MAPEC_LIFE study (LIFE12 ENV/ IT/000614)

M. Verani[1], A. Carducci[1], B. Casini[2], G. Donzelli[1], E. Carraro[3], C. Pignata[3], T. Schilirò[3], E. Ceretti[4], G.C.V. Viola[4], L. Covolo[4], S. Levorato[5], T. Salvatori[5], S. Vannini[5], T. Grassi[6], A. Idolo[6], F. Serio[6], S. Bonizzoni[7], A. Bonetti[8], U. Gelatti[4], MAPEC_LIFE Study Group
[1]Department of Biology, University of Pisa, Pisa, Italy, [2]Department of Translational Research, N.T.M.S., University of Pisa, Pisa, Italy, [3]Department of Public Health and Pediatrics, University of Torino, Torino, Italy, [4]Department of Medical and Surgical Specialties, Radiological Sciences and Public Health, University of Brescia, Brescia, Italy, [5]Department of Pharmaceutical Sciences, University of Perugia, Via del Giochetto, 06122 Perugia, Italy, [6]Department of Biological and Environmental Science and Technology, University of Salento, Lecce, Italy, [7]Comune di Brescia, Brescia, Italy, [8]Centro Servizi Multisettoriale e Tecnologico – CSMT Gestione S.c.a.r.l., Brescia, Italy

Particulate Matter (PM) is the atmospheric pollutant that mostly affects human health. One aim of the MAPEC_LIFE study is to evaluate children exposure to urban air pollution investigating the $PM_{0.5}$ mutagenic and genotoxic effect. The samples were collected in children school areas in two seasons (winter-spring) using a high-volume air sampler. $PM_{0.5}$ organic extracts were chemically analyzed, assayed on four Salmonella strains by Ames test and on A549 cell line by comet assay and micronucleus test. Results revealed that $PM_{0.5}$ represents a very variable PM_{10} percentage (range 19.6-63% and 9.9-55.9% in winter and spring respectively). In winter all $PM_{0.5}$ extracts showed at least one mutagenic dose with Salmonella TA98 strain suggesting the presence of indirect mutagens, while a lower effect was observed with the TA100 strain. The results with TA98NR and YG1021 strains in both seasons showed the presence of nitroaromatic compounds as confirmed by the chemical analysis. No genotoxic or oxidative effect was observed using the comet assay and micronucleus test in both seasons. The results suggest to investigate the biological effect of the other PM fractions, in particular $PM_{0.5-1}$.