ROLE OF OXIDATIVE STRESS ON HIV-1 MEDIATED APOPTOSIS AND ON TELOMERES LENGTH IN AN HUMAN ASTROCYTOMA CELL LINE

Antonella Sgura[1], Alberto Biasin[1], Michela Pollicita[2], Stefano Aquaro[3], Caterina Tanzarella[1]

Dept. of Biology, University of Rome "Rome Tre"; [2]School of Medicine, University of Rome "Tor Vergata", Rome; [3]Dept. of Pharmaco-biology, University of Calabria, Italy

Oxidative stress, involved in HIV-1 disease, plays a key role in the neuropathogenesis of HIV-1 infection. Cells infected with HIV-1 produce more free radicals, involved in apoptosis of both astroglia and neurones. Recent data show that oxidative stress is responsible also of accelerates telomere shortening of human fibroblast in vitro. The relationship between neuroAIDS/oxidative stress, and oxidative stress/telomere and telomerase modulation is an important issue for studies on the role of telomeres and telomerase activity regulation in HIV-1 related disorders. Incubation of U373 with HIV-1IIIB leads to significant induction of cellular apoptosis (1day: 37%; 3day: 81%; 5day: 75%; 10 day: 90%; 15 day: 60%; $p < 0.001$). Apoptosis was reduced of 30% in the presence of 1mM NAC at 5 day after virus exposure ($p<0.001$). At the same day the U373 exposed respectively to supernatants released from NAC-treated and not NAC-treated HIV-1 infected macrophages, reduced apoptosis of 12%. Analysis of telomere length showed, in HIV-1 exposed U373, a statistically significant telomere shortening, with a peak at day 10 after virus challenge (1day: 13%; 3day: 13%; 5day: 16%; 10 day: 26%; 15 day: 17%; $p \leq 0.001$). At the same treatment time-points, TRAP assay was employed to evaluate the telomerase activity in HIV-exposed U373 (1day: 13%; 3day: 43%; 5day: 60%; 10 day: 20%; 15 day: 29%). Our results support the role of HIV-1-mediated oxidative stress in astrocytic damage, and indicate that the telomere structure, target for oxidative damage, could be the key sensor of cell apoptosis induced by oxidative stress after HIV infection.