Igor Del Vecchio
Department of Sperimental and Applied Pharmacology
**Study of the transcriptional regulation during senescence**
**Prof. Marco Racchi**

Senescence of immune and endocrine systems are naturally occurring processes that seem to "cross-talk" (1). Direct misregulation of one system will impact on the response of the other. The involution of the thymus and the corresponding reduction of circulating T cells are common anatomical hallmarks of the immune system aging, whereas endocrinosenescence leads to alterations of the hormone levels (i.e loss of DHEA or DHEA/Glucocorticoids unbalance) in the blood stream (1). On the cell membrane TLRs (Toll Like Receptors) have a "key-role" for the innate immune response (2) and their malfunction has been correlated with the immunosenescence (3). TLRs signalling ultimately promote the activation of the transcription factor NF-kB. We previously demonstrated *in vivo* and *in vitro* a direct and age-dependent correlation between the plasmatic levels of the pro-hormone DHEA (dehydroepiandrosterone) and the RACK1 (Receptor for Activated C Kinase1) protein levels (4,5). Noteworthy different papers on PKC (Protein Kinase C) involvement in the NF-kB pathway have been published so far (i.e. 6,7,8). All this data led us to hypothesize that the RACK1 gene can be regulated by these mechanisms. Here we investigated in monocytic THP1 and neuroblastoma SH-SY5Y cells if DHEA was able to activate the promoter of the human GNB2L1 (Guanine Nucleotide Binding protein 2-Like 1) gene coding for RACK1 protein whose structure we describe for the first time. Then, basing on a bioinformatic screening, we studied the involvement of NF-kB and GR (glucocorticoids receptor) in the regulation of the same promoter (9). To rapidly clone deletion mutants we developed the first Gateway luciferase reporter vector GWluc-basic, a real technological improvement in the study of promoters (10).

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1. **Del Vecchio I.**, Zuccotti A., Corsini E., Racchi M., Lucchelli A., Govoni S. Mapping of the human promoter of GNB2L1 gene encoding the RACK1 protein and its regulatory role in the immunosenescence. 33° Congresso Nazionale della Società Italiana di Farmacologia, Cagliari, June 6/8 – 2007.

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