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Proteins as biomarkers: seladin and haemoglobin
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Here we report on a flavoprotein, called seladin or DHCR24, involved in neuroprotection in Alzheimer Disease and in activity regulation of p53 in tumor suppression. This protein possesses the catalytic activity to reduce demosterol into cholesterol in cholesterol biosintetic pathway. In order to understand the structural and biochemical properties of this enzyme, we have tried to express recombinant seladin in *E.coli*. This enzyme presents a putative N-terminal signal peptide followed by a transmembrane region. We have tried recombinant expression of several N-terminal truncations of seladin, as well as the *full length* protein. With these genes and different expression vectors a large number of constructs have been produced, using restriction sticky-ends cloning strategy; then they have been screened on various cells strains and cell growing conditions and finally tested for different purification strategies. The protein seems to be expressed in soluble form only when fused to an MBP tag, but in a partially unfolded form that aggregates after removal of the tag. Recent experiments have shown that by expressing a truncated mutant construct without the first 57 amino acids, by using an expression vector that bears N-terminal His and MBP tags, it is possible to produce soluble and stable seladin. On the other hand we are studying the effect of nitrative and oxidative stress on human haemoglobin in patients affected by different diseases. It appears that in the presence of nitrative stress a dimerization of Hb subunits occurs. If a correlation between Hb subunits dimerization and pathologic states could be established, the α - β dimer may become a biomarker of pathological conditions.

Publications

1. Ziche, M., Donnini, S., Morbidelli, L., Monzani, E., Roncone, R., **Gabbini, R.**, and Casella, L. (2008). Nitric Oxide Releasing Metal-Diazeniumdiolate Complexes Strongly Induce Vasorelaxation and Endothelial Cell Proliferation. *ChemMedChem*, *in press*.

NOTE that the even if the article is in press now it has been written and sent before the beginning of the school and because of that it doesn't contain acknowledgments to the project.