Ala substitution by Arg or Trp brought about a 500% and 100% increase of *E. coli* ATCC 25922 and *S. aureus* ATCC 29213 inhibition, respectively. Ala substitution by Lys leads to 100% inhibition increase of both microorganisms.

While Ala substitution by Tyr decreases to half inhibition of *E. coli* ATCC 25922, it brought about an inhibition increase of 500% of *S. aureus* ATCC 29213.

Our results suggest that Arg and Trp are the best candidates of each group (positively charged and hydrophobic, respectively) for Ala 108 substitution pointing to increase the antimicrobial activity of the lead fragment 107—115 against both Gram (+) and (−) microorganisms.

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1.1.09

The Chembiobank project: building annotated molecular libraries for drug discovery

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The goal of the Chembiobank project (CBB, http://www.pcb.ub.cat/chembiobank/) is to build a chemico-biological library and database, annotated with both biological and bioinformatic data, addressed to the scientific community and to the pharmaceutical and biotech industries. Chemical compounds (natural and synthetic), from academic groups, will be properly characterized using analytical methods (LC/MS) with standards set by CBB. Compound traceability of any compound deposited in the CBB library will be assured, through a logistic procedure that will cover the handling and storage of compounds in conditions that allow their pharmacological characterization in high-throughput screening assays, as well as the generation of a database that contains the chemical structures of these compounds. Currently, the CBB library contains a core of 1100 molecules, which include commercial standards, which should be growing with additional compounds from academic groups.

The Chembiobank project is a joint initiative between the Parc Científic Barcelona (PCB) responsible for the chemical and logistics aspects of the project, and for its coordination; the Universidad de Santiago de Compostela (USC) responsible for the screening assays for the library compounds; and GRIB (IMIM-UPF), located at the Parc de Recerca Biomédica de Barcelona, responsible for the virtual screening for these compounds.

This presentation will include the results obtained so far in the five areas of this chemical biology project: chemistry, logistics, virtual screening, high-throughput screening and databases. In particular, the application of the results obtained through a pilot implementation consisting in the computational and biological annotation of a library of 1100 compounds of therapeutic interest will be described.

This project is coordinated with other chemical biology initiatives being developed in several European countries, to build eventually a European annotated academic molecular library. A first step in this direction, the EU-Openscreen project, has been included in the European Strategy Forum for Research Infrastructures (ESFRI) Roadmap in October 2008.

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1.1.10

Redox status of K562 cells after α-tocopherol treatment

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Tocopherols, early described as a vitamin that brings birth, have been identified as redox compounds capable of radical scavenging in a lipid phase. The recent finding that α-tocopherol phosphate is present in cells in small amounts assigned α-tocopherol to the group of signaling molecules, rather than to that of antioxidants. When antioxidant levels are augmented by either genetic or pharmacologic means the impact on tumor cells both *in vitro* and *in vivo* has been to inhibit tumor growth and/or differentiation. We examined effect of α-tocopherol addition on free thiol content and SOD activity in K562 cells.

The K562 cell line (human erythroleukemia) was routinely grown in six-well tissue culture plates (Costar, USA) in RPMI 1640 (Sigma) supplemented with 2 mM glutamine, 10% heat-inactivated fetal calf serum (NIVNS) and antibiotics. Cells were cultured at 37°C in a humified 5% carbon dioxide atmosphere. Exponentially growing K562 cells were used throughout the assays. Cells were seeded in culture flasks at a concentration of 0.85×10^6 per flask. The samples were divided into three groups: 1. Control group (untreated samples). 2. Experimental group of α-tocopherol treated samples. 3. Experimental group α-tocopherol pretreated samples treated with sodiumnitropruside.

Free —SH groups were determinated according to Ellman and SOD activity was measured according to the McCord and Fridowich.

We found that in K562 cell treatment with α-tocopherol lead to increase of free SH group. Activity of SOD was also increased in treated K562 cell in comparison with controls. The mRNA of CuZnSOD has been reported to be increased by shear stress, radiation and xenochemicals in cultured cells, suggesting a potential effect of that antioxidant on the growth and resistance of cancer cells. These results indicate potential dual role of α-tocopherol: induction of more reduced cell state (increased free —SH) and increased resistance of cancer cells to treatment which induce oxidative stress (increased SOD). As measured changes occurred in hydrophilic cytosol phase some signaling role of α-tocopherol cannot be excluded.

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