

**G012** GENE STRUCTURE AND REGULATION OF THE EXPRESSION OF THE M1 AND M2 SUBUNITS OF MOUSE RIBONUCLEOTIDE REDUCTASE. L.Thelander, Department of Physiological Chemistry, University of Umeå, S-901 87 Umeå, Sweden.

Ribonucleotide reductase activity is strongly S-phase correlated. We have measured the amounts of M1 and M2 mRNA during the cell cycle and in resting vs proliferating cells as part of a project aiming at understanding the regulation of the expression of the two subunits. Furthermore, the genes encoding the mouse M1 and M2 proteins have been cloned. The full sequence of the 6 kb of DNA comprising the functional M2 gene was determined. Transfection of Balb/3T3 cells with the M2 genomic DNA resulted in stable transformants with a selectable phenotype, i.e. resistance to hydroxyurea.

**G013** METAL AND RADICAL CATALYSIS OF RIBONUCLEOTIDE REDUCTION Hartmut Follmann, Dept.Chemistry & Biology, Universität Kassel, D-3500 Kassel, Fed.Rep.Germany

Ribonucleotide reduction is an essential and universal reaction which provides the 2'-deoxyribonucleotides for DNA replication. It is unusual in that rather different enzymes have evolved for its catalysis: Deoxyadenosylcobalamin-dependent reductases predominate in anaerobic prokaryotes while iron (Fe-O-Fe)/tyrosine radical proteins are found in eukaryotes and in *E.coli*. We have detected a new type in the coryneform bacteria which utilize manganese ribonucleotide reductases (Willing, Follmann, and Auling, 1988), and a fourth system is likely to exist in the methanogenic archaeobacteria. However, the enzymes also have mechanistic and regulatory similarities. Their ancestry appears to be linked to the presence of O<sub>2</sub> for radical generation. Possible model reactions will be discussed.

**G014** SOLUTION STRUCTURE DETERMINATION OF PSEUDOMONAS AERUGINOSA CYTOCHROME C<sub>551</sub> USING 2-D NMR SPECTROSCOPY. David Detlefsen, Venkataraman Thanabal, Gerhard Wargner and Vincent L. Pecoraro, Departments of Chemistry and Biophysics, The University of Michigan, Ann Arbor, MI 48109.

Cytochrome c<sub>551</sub> is the reductant of azurin in the respiratory chain of *Pseudomonas aeruginosa*. A high resolution x-ray structure of the protein has appeared. In this contribution, we will present our progress on determining the solution structure of the Fe(II) protein and compare it to the x-ray structure. We will also report our initial studies on the structural determination of the Zn(II) substituted protein.