PS05.01.20 IMIDAZOLE AND TETRAZOLE AS LIGANDS FOR CALCIUM AND MAGNESIUM. Drake S. Eggleston, R. Curtis Haltiwanger, Dana Sherman, Lisa Garber, SmithKline Beecham Pharmaceuticals, 709 Swedeland Road, King of Prussia PA 19406 USA

With an eye toward the potential utility of such heterocycles as components of molecules with pharmacological action we have prepared and characterized structurally a number of Mg(II) and Ca(II) complexes with neutral imidazoles or ionized tetrazole in the primary coordination sphere. A desire to understand the roles of the group IIa metal ions Mg(II) and Ca(II) in biological processes and biomolecular structure stabilization has prompted many previous investigations into the nature and extent of their coordination environment(s). Magnesium always exhibits octahedral coordination while Ca(II) can easily expand its coordination sphere. Based on observations from biological systems it is also generally accepted that oxygen containing ligands present a preferred coordination milieu for both ions, consistent with hard-soft acid-base theory. In a majority of Mg(II) binding sites one or more protein carboxylate ligand(s) are found coordinated, with oxygen(s) from backbone carbonyl or alcohol groups also heavily represented. Histidine nitrogen has been reported only once as a ligand. N-methyl benzodioxin-2-(3H) methyl sulfonyl, 2-methyl imidazole, imidazole acetate or ionized tetrazole also heavily represented. Histidine nitrogen has been reported only once as a ligand. N-methyl benzodioxin-2-(3H) methyl sulfonyl, 2-methyl imidazole, imidazole acetate or ionized tetrazole also heavily represented. Histidine nitrogen has been reported only once as a ligand. N-methyl benzodioxin-2-(3H) methyl sulfonyl, 2-methyl imidazole, imidazole acetate or ionized tetrazole also heavily represented. Histidine nitrogen has been reported only once as a ligand.

Peptides

PS05.02.01 COORDINATION OF LITHIUM TO AMINO ACIDS AND DIPETIDES. Gerd-Michael Maier, Gerhard Müllner, Martin Lutz, Fakultät für Chemie der Universität Konstanz, Universitätstr. 10, D-78464 Konstanz, Germany, E-mail: xanorg@vg10.chemie.uni-konstanz.de

The coordination of Li+ to neutral (zwitterionic) and deprotonated (anionic) amino acids and dipetides was investigated in the solid state. The results of structure determinations on 7 amino acid complexes and 13 dipeptide complexes may be summarized as follows:

Ligand complexes of neutral amino acids and dipetides: 
\[-COO-> \cdot H_2O \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \·

the carboxylate groups are coordinated to one, two or three Li+ counterions, respectively. In the crystal the coordination polymers form strands, sheets, or threedimensional networks of Li+ and the ligands with extensive hydrogen bonding between the latter which may include solvent molecules.

The results allow the conclusion that the Li+ ligand interaction in these complexes may be compared to hydrogen bonds what regards their structural properties and probably also their energetics.

PS05.02.02 L-VALYL-L-GLUTAMINE AND L-GLUTAMYL-L-VALINE. Carl Henrik Gorbicz and Paul Hoff Backe, Department of Chemistry, University of Oslo, PO.Box 1033 Blindern, N-0315 Oslo, Norway.

The structure of L-Val-L-Glu [Eggleston, (1984), Acta Cryst. C40, 1250-1252] has a crystal packing arrangement and H-bond pattern rather similar to L-Val-L-Gln, but radically different from L-Glu-L-Val, which contains the same amino acid residues in reversed order. Nevertheless, the specific hydrogen bond interactions are almost identical for L-Val-L-Glu and L-Val-L-Val, indicating very distinct hydrogen bonding preferences. This is the first demonstration of such a coincidence among dipeptide structures.

The differences between L-Val-L-Glu and L-Val-L-Gln structures stem from modifications of the molecular geometry and cell parameters due to formation of an additional hydrogen bond from the extra donor in the L-Gln side chain.

Both molecular geometries are normal, except for a unique eclipsed orientation of the main chain amino group of L-Glu-L-Val.

Crystal data and refinement Both data sets were collected on a Nicolet P3 diffractometer at 120 K.

L-Val-L-Gln: Space group P21_21_2, a = 16.419(3), b = 15.309(3) and c = 4.7081(1), final wR(F2) = 0.100 for 2044 independent reflections, R(F2) = 0.050 for 1475 refl. with I > 2σ(I).

L-Val-L-Glu: Space group P21, a = 6.487(2), b = 5.505(2), c = 16.741(4) Å and β = 97.22(2)°, final wR(F2) = 0.011 for 1920 independent reflections, R(F2) = 0.047 for 1576 refl. with I > 2σ(I).

Studies of novel sulfamate anticonvulsant drugs developed by E.B. Maryanoff show that activity correlates with a skew conformation of the central ring and an extended conformation of the sulfonamide side chain. Additionally, the crystal structures of active compounds demonstrate unique hydrogen bonding networks. Clinical trials of compound 1 (topiramate) it is effective against partial-onset seizures. We have determined the crystal structures of six related compounds; conformational, graph set and modeling analysis of these data will be presented. Compound 1: Topiramate 2,3-4,5-bis-0-(1-methyltetrahydridene)-b-D-fructopyranose sulfamate, Compound 2: 4,5-0-cyclohexyldiene-2-3-O-(1-methyltetrahydridene)-b-D-fructopyranose sulfamate, Compound 3: 2-3-0-(1-methyltetrahydridene)-b-D-fructopyranose sulfamate, Compound 4: 1,2-3,4-bis-O-(1-methyltetrahydridene)-b-D-fructopyranose sulfamate, Compound 5: 1,2,3,4-Terahydro-2-naphthalenyl methyl sulfamic acid ester, Compound 6: 1,4 benzoazin-methyl sulfamic acid ester.