PS05.07.02 STRUCTURAL SYSTEMATICS OF *MYO*-INOSITOL DERIVATIVES. Carl H. Schwalbe & Ian D. Spiers, Pharmaceutical Sciences Institute, Dept. of Pharmaceutical & Biological Sciences, Aston University, Birmingham B4 7ET, U.K

Myo-inositol 1,2,3-trisphosphate may act biologically as an iron chelator and anti-oxidant. While developing an efficient synthesis of this biochemical we obtained crystal structures of four key intermediates, the final product, and a related derivative of myo-inositol (MI):

1. D/L-1,2;4,5-di-O-cyclohexylidene MI,
2. D/L- 1 -O-(t-butyldiphenylsilyl)-2,3-O-cyclohexylidene MI,
3. 4,5,6-tri-O-benzoyl-2,
4. 4,5,6-tri-O-benzoyl MI 1,2,3-tris(dibenzyl phosphate),
5. monosodium tetra(cyclohexylammonium) MI 1,2,3-trisphosphate,
6. D/L-cis-1,2-O-cyclohexylidene-3,4,5,6-tetra-O-benzyl MI.

Related structure determinations describe 23 independent molecules.

MI itself (MYINOL) exhibits a near-perfect chair conformation with five OH groups equatorial, one (at C2) axial. Even when all OH groups are individually substituted with bulky groups as in 4, or with charged groups as in 5, the chair is maintained with average pseudorotation amplitude parameters q2 = 0.059, q3 = 0.584 for 19 molecules. Imposition of one acetal five-membered ring as in 2,3, and 6 distorts the chair: <q2> = 0.161, <q3> = 0.533, n= 4; and a second acetal ring as in 1 heightens the distortion: <q2> = 0.222, <q3> = 0.546, n= 4. The chair may retain a plane of symmetry by flattening one vertex and puckering the opposite one, or it may preserve a twofold axis while twisting. In one more extreme case 1,2;5,6-di-Oisopropylidene MI (PINMII) the chair form is lost entirely. Restrictive bridges and interaction of MI phosphates with metal ions as in sodium phytate (NAMIHP10) can change the substituent conformation to 5-axial/1-equatorial, where <q2> = 0.127, <q3> = 0.549, n= 3. Semi-empirical AM1 molecular orbital calculations were validated against *ab initio* results and used to compare conformational energies. For *myo*-inositol itself the 5-axial/1-equatorial OH conformer is 3 kcal/mol higher in energy than the normal 5-equatorial/1-axial; for fully ionised 5 the difference increases to 23 kcal/mol. This work was supported by the Science and Engineering Research Council. Reference codes and parameter calculations are taken from the Cambridge Crystallographic Database.

PS05.07.03 SYNTHESIS AND CHARACTERIZATION OF COPPER, NICKEL, COBALT 2-FORMYLURACIL THIOSEMICARBAZONE COMPLEXES. G. Pelosi, M.Belicchi Ferrari, G.Gasparri Fava, P. Tarasconi & R. Rossi, Dip. di Chimica Generale ed Inorganica, Chimica Analitica, Chimica Fisica e Centro di Studio per la Strutturistica Diffrattometrica del CNR, Viale delle Scienze 78, Università degli Studi di Parma, 43100 Parma, Italy

In order to elucidate the biological effects of thiosemicarbazones on Friend erythroleukemia cells (FLC), an extensive work is being carried out in our laboratory on a wide range of derivatives and their transition metal complexes systematically followed by tests *in vitro*. Most recently our attention has been focused on the influence of the aliphatic/aromatic nature of the ligand and the stereochemistry of the metal ion on the biological activity of this class of compounds. At present we are synthesising and characterising metal complexes of a novel compound: 2-formyluracil thiosemicarbazone (H_3ut). With this ligand we have recently reported the crystal structures of copper- and cobalt-containing complexes prepared starting from their divalent ions chlorides: $[Cu(H_2ut)(OH_2)Cl]\cdot 2H_2O$, $[Cu(H_3ut)Cl_2]\cdot 2H_2O$ and $[Co(H_2ut)_2]0.5(SO_4)\cdot 2.5H_2O$. The new compounds we are presenting have been prepared by adding H_3ut to $Cu(NO_3)_2\cdot 3H2O$ and $NiCl_2\cdot 6H_2O$ water solutions. The crystals obtained have the following stoichiometry: $[Cu(H_3ut)(OH_2)]SO_4\cdot 3H_2O$ and $[Ni(H_3ut)(OH_2)_2Cl]Cl\cdot H_2O$. The former crystallises in space group *C2/c*, with cell constants a=21.009(5), b=12.174(4), c=14.900(4)Å, β=125.44(3)°. The copper atom presents a square pyramidal coordination geometry with the basal plane positions occupied by the ligand O,N,S atoms, the fourth position by a water and the apical position by a sulphate oxygen. The latter presents cell parameters of a=16.345(5), b=12.967(4), c=6.756(2)Å and β=92.40(1)°, space group *P2 /c*. The nickel atom coordinates octahedrally six donor atoms: the equatorial positions are the same as the previous compound while the two apexes are occupied by a water molecule and a chloride ion. The remaining charge on the metal is neutralised by a second chloride ion lying outside its coordination sphere.

M.Belicchi Ferrari, G.Gasparri Fava, P.Tarasconi, G.Pelosi , XXV Congresso Nazionale, AIC, Giardini Naxos, 25-27 September, 54 (1995) M.Belicchi Ferrari, G.Gasparri Fava, P.Tarasconi, R.Albertini, S.Pinelli, and R.Starcich, J.Inorg. Bioch., 1994, 53, 13 and refs. therein.

PS05.07.04 CRYSTAL STRUCTURES OF AZOLOPYRIDAZINES. Anna Katrusiak, S. Baloniak and A. Katrusiak+, Department of Organic Chemistry, Karol Marcinkowski University of Medical Sciences, Grunwaldzka 6, 60-780 Poznan, Poland. +Department of Crystal Chemistry, Adam Mickiewicz University, Grunwaldzka 6, 60-780 Poznan, Poland

Crystal structures of several azolopyridazine derivatives will be presented, and the molecular aggregations and interactions compared and discussed. Triazolo- and tetrazolopyridazines show interesting biological and pharmacological activities and have been applied in various drugs [A. Deeb and S. A. Said, Collect. Czech. Chem. Commun. 55 (1990) 2795]. The pyridazine ring is a fragment of many compounds of a broad biological activity, for example bacteriostatic or cystostatic, and inhibitors in enzymatic processes [G. Biagi et al., Farmaco 47 (1992) 91]. The investigated series include 6-hydrazino-, 6-morpholino-, and 6-azido-1,2,3,4-tetrazolo[5,4-b]pyridazines, and 6-azido-1,2,3-triazolo[4,3-b]pyridazine. In the crystal lattices the molecules are usually arranged into planar sheets. Short intermolecular contacts CH...N have a character of weak hydrogen bonds, influence the molecular aggregation, and appear to be characteristic interactions in the structures of these compounds.

PS05.07.05 CRYSTAL STRUCTURE OF A BETA-CARBOLINE DERIVATIVE - MEDICINALLY ACTIVE COMPOUND. L.Govindasamy, D.Velmurugan, K.Ravikumar(1) and A.K.Mohanakrishnan(2). Department of Crystallography and Biophysics, University of Madras, Madras-600 025, India; (1)Laboratory of Crystallography, Indian Institute of Chemical Technology, Hyderabad-500 007, India; (2)Department of Organic Chemistry, University of Madras, Madras-600 025, India

The use of β-carbolines has been instrumental for the development of the inverse agonist / agonist pharmacophore of the benzediazepine receptor site(BzR). The BzR plays a central role in the molecular mechanism controlling anxiety, memory learning, sleep, convulsant and proconvulsant activities. In view of the above importance we report the crystallographic study of one of the β-carboline derivatives. Preliminary results :$C_3OH_2ON_2O_4S2$, P_1bar, a = 10.184(1), b = 10.941(1), c = 13.441(1), α = 84.80(2), β = 67.94(1) and γ = 82.65(2). The crystal structure was solved by Direct methods and refined to a final R value of 0.055. The conformational features will be presented.