

Chromium-induced abnormalities in lymphocyte proliferation: Evidence for influence of ligand structure

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A series of chromium complexes have been incorporated by design during *in vitro* lymphocyte proliferation and chromium-induced abnormalities in cell growth investigated. The complexes of chromium chosen for study are hexaaquachromium(III) chloride **1**, *tris*-oxalatochromate(III) **2**, ethylenediaminetetraacetatochromium(III) **3**, *trans*-diaqua-*N,N'*-ethylenebis(salicylideneiminato)-chromium(III) (Cr(salen) (H₂O)₂)⁺ **4**, *trans*-diaqua-*N,N'*-propylenebis (salicylideneiminato) chromium(III) (Cr(salen) (H₂O)₂)⁺ **4**, *trans*-diaqua-*N,N'*-propylenebis (salicylideneiminato) chromium(III) (Cr(salprn) (H₂O)₂)⁺ **5**, and sodium chromate **6**. Varying quantities (10⁻⁷ – 10⁻³ M) of chromium salts were added to the media and lymphocyte cell viability assessed. Investigations reveal that most Cr(III) salts (**1**–**3**) do not induce abnormalities in lymphocyte proliferation upto a concentration of 10⁻³ M. The addition of **6** (10⁻⁶ – 10⁻⁷ M) or **4** and **5** (10⁻³ – 10⁻⁵ M) led to significant decrease in the viability of cells. The DNA synthesis as evidenced from H³-thymidine incorporation also provided evidence for the chromium induced abnormality in cell proliferation when **4**, **5** and **6** are added. Compelling evidence for *apoptosis* (programmed cell death) due to the presence of Schiff base complexes of chromium(III) has now been obtained. More detailed mechanistic studies pertaining to the special features of **4** and **5** and possible roles of Cr(IV) and (V) are under investigation.

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