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Using synchrotron radiation to determine the X-ray structure and ct-DNA binding affinity of platinum(II) anticancer complexes

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Platinum(II) anticancer complexes incorporating 2,2'-bipyridine (bpy), 4,4'-dimethyl-2,2'-bipyridine (44Me2bpy) and 2-(2'-pyridyl)quinoxaline (2pq) as polyaromatic ligands and cyclic diamines as ancillary ligands have been synthesised and were characterised via several methods including synchrotron radiation X-ray crystallography. The crystal structure of $[\text{Pt}(\text{44Me2bpy})(1\text{S},2\text{S-diaminocyclohexane})]^{2+}$ (44MEBSS) revealed a square planar coordination geometry similar to other complexes of this type whereas the complex $[\text{Pt}(2\text{pq})(1\text{S},2\text{S-diaminocyclohexane})]^{2+}$ (2PQSS) was distorted square planar.. The binding of 2PQSS and 44MEBSS to calf-thymus DNA (ct-DNA) was analysed using synchrotron radiation circular dichroism (SRCD) melting experiments and compared to similar complexes that incorporate 1,10-phenanthroline and dipyrdo[3,2-f:2',3'-h]quinoxaline. The results revealed unexpected trends in DNA affinity relative to polyaromatic ligand size.

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Primary author: Mr PAGES, Benjamin (University of Western Sydney)

Co-authors: Dr LI, Feng (University of Western Sydney); Prof. ALDRICH-WRIGHT, Janice (University of Western Sydney); Dr JONES, Nykola (Department of Physics and Astronomy - Institute for Storage Ring Facilities, Aarhus University, Denmark); Dr ZHANG, Yingjie Zhang (ANSTO)

Presenter: Mr PAGES, Benjamin (University of Western Sydney)

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