Contemporary platinum(II) anticancer drugs, such as cisplatin and carboplatin, covalently bind to DNA and exhibit many disadvantages including poor selectivity, acquired resistance, cross-resistance and severe side effects.\textsuperscript{1} Research has focused on the development of complexes that do not demonstrate these clinical disadvantages; one example of this is the synthesis of complexes that can bind to G-quadruplex DNA (QDNA), in preference to B-DNA, in order to affect the reproduction of cancerous cells.\textsuperscript{2} We have recently synthesized dinuclear (2,2':6',2''-terpyridine)-based complexes that are connected by thiol chains of varying length (examples in Figure below with IC\textsubscript{50} in L1210 cells).\textsuperscript{3} These compounds have demonstrated potent cytotoxicity in cancerous cell lines and are thought to interact with Q-DNA through π-stacking interactions involving their terpyridine moieties. Small molecules that selectively bind to QDNA have been shown to stabilize these structures, and so Q-DNA represents a potential biological target for the suppression of telomerase activity.\textsuperscript{4} Here the study of the binding of our platinum(II) complexes to Q-DNA, including the use of synchrotron radiation circular dichroism (SRCD), fluorescence, mass spectrometry and docking simulation techniques.

References: