

30016 Cytotoxic ruthenium complexes

The Technology

Several research groups have reported that certain transition metal complexes bind reversibly to DNA, whereupon they function as “light switches” i.e. display luminescence which is absent (quenched) in aqueous media. Scientists at the University of Sheffield have been investigating the properties of one such group of mononuclear ruthenium (II) polypyridyl complexes (Figure 1).

The complexes function effectively as multifunctional DNA probes, allowing their use as imaging agents in TEM and confocal laser scanning microscopy (CLSM). In cellulo images have been acquired from both live and fixed cells, and it has been demonstrated that the complexes are taken into the cell by an active transport mechanism.

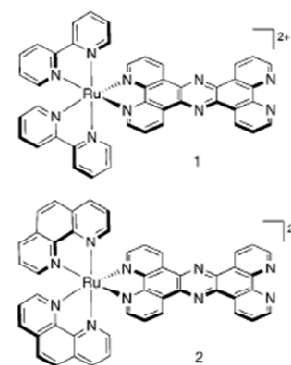


Fig 1.

The complexes have also been shown to have potent cytotoxicity comparable to cisplatin for several cancer cell lines (Table 1). Cisplatin is the leading treatment for a variety of cancers, including metastatic breast and ovarian tumours; however, most tumours develop a resistance towards these platinum-based treatments which limits their practical effectiveness. Most importantly the mononuclear Ru complexes studied at Sheffield continue to display cytotoxicity in a cisplatin-resistant daughter cell line (Table 1), indicating a different mode of action to cisplatin.

Intellectual Property

A patent application has been filed that covers various aspects of this technology.

The Opportunity

The complexes have potential as the basis for of a new class of anticancer chemotherapy drug, with the advantage of acting as their own contrast agent for localisation in TEM & CSLM images. Current development is directed towards establishing the exact mechanisms of cytotoxicity and cell entry in preparation for trials in living organisms. Partners with complementary expertise and facilities are sought for this in vivo work and subsequent development of promising lead compounds. We are also seeking speciality chemical companies to licence manufacture and distribute the complexes as multifunctional imaging agents for cellular DNA.

For commercial enquiries on this technology, please contact Andrew Tingey, quoting reference 30016.

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Complex	MCF-7	A2780	A2780-CP70
1	53 ± 7	36 ± 6	47 ± 6
2	36 ± 3	11 ± 6	20 ± 5
cisplatin	12 ± 2	12 ± 2	55 ± 8