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(54) **IRIDIUM/RHODIUM ANTI-CANCER COMPOUNDS**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,284,644	A *	2/1994	Kruper et al.	424/1.53
7,709,654	B2 *	5/2010	Smith et al.	548/235
2011/0039815	A1 *	2/2011	Youngs et al.	514/184

FOREIGN PATENT DOCUMENTS

EP	1471567	A1	10/2004
EP	2543675	A1	1/2013
WO	2011010072	A2	1/2011

OTHER PUBLICATIONS

Schneider et al. From Mononuclear (C5H5CH2C5H4)M to Unsymmetrical Dinuclear M(C5H4CH2C5H4)M and heterodinuclear M(C5H4CH2C5H4)M" Transition-Metal Complexes 1. Organometallics (1993). 12(11):4420-4430.

* cited by examiner

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(57) **ABSTRACT**

The present invention relates to novel iridium and/or rhodium containing complexes for use as a cytotoxic, such as an anti-cancer agent. There is also provided a method of preparing said compounds.

12 Claims, 16 Drawing Sheets