

PubMed

Display Settings:  Abstract[Cell Biochem Funct.](#) 2010 Jan;28(1):15-23.

## The novel ruthenium-gamma-linolenic complex [Ru(2)(aGLA)(4)Cl] inhibits C6 rat glioma cell proliferation and induces changes in mitochondrial membrane potential, increased reactive oxygen species generation and apoptosis in vitro.

Ribeiro G, Benadiba M, de Oliveira Silva D, Colquhoun A.

Department of Fundamental Chemistry, University of São Paulo, SP, Brazil.

### Abstract

The present study reports the synthesis of a novel compound with the formula [Ru(2)(aGLA)4Cl] according to elemental analyses data, referred to as Ru(2)GLA. The electronic spectra of Ru(2)GLA is typical of a mixed valent diruthenium(II,III) carboxylate. Ru(2)GLA was synthesized with the aim of combining and possibly improving the anti-tumour properties of the two active components ruthenium and gamma-linolenic acid (GLA). The properties of Ru(2)GLA were tested in C6 rat glioma cells by analysing cell number, viability, lipid droplet formation, apoptosis, cell cycle distribution, mitochondrial membrane potential and reactive oxygen species. Ru(2)GLA inhibited cell proliferation in a time and concentration dependent manner. Nile Red staining suggested that Ru(2)GLA enters the cells and ICP-AES elemental analysis found an increase in ruthenium from <0.02 to 425 mg/Kg in treated cells. The sub-G1 apoptotic cell population was increased by Ru(2)GLA (22 +/- 5.2%) when analysed by FACS and this was confirmed by Hoechst staining of nuclei. Mitochondrial membrane potential was decreased in the presence of Ru(2)GLA (44 +/- 2.3%). In contrast, the cells which maintained a high mitochondrial membrane potential had an increase (18 +/- 1.5%) in reactive oxygen species generation. Both decreased mitochondrial membrane potential and increased reactive oxygen species generation may be involved in triggering apoptosis in Ru(2)GLA exposed cells. The EC(50) for Ru(2)GLA decreased with increasing time of exposure from 285 microM at 24 h, 211 microM at 48 h to 81 microM at 72 h. In conclusion, Ru(2)GLA is a novel drug with antiproliferative properties in C6 glioma cells and is a potential candidate for novel therapies in gliomas.

2009 John Wiley &amp; Sons, Ltd.

PMID: **19927275** [PubMed - indexed for MEDLINE][+ Publication Types, MeSH Terms, Substances](#)[+ LinkOut - more resources](#)