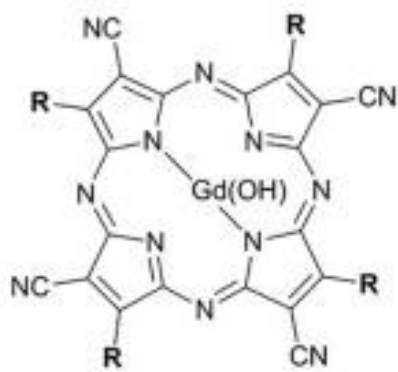


Research (What is it about?)	<b>Tumor imaging and photodynamic therapy of cancer</b>
UNN authors	<i>Balalaeva I., Lermontova S., Yuzhakova D., Klapshina L., Gavrina A., Muravieva M.</i>
We find (The result)	The tetrapyrrole based compound with gadolinium ions as novel <b>theranostic</b> agent which combines two diagnostic modalities (fluorescent/MR) with photodynamic therapy has been prepared and its efficiency in case of mouse carcinoma has been demonstrated <i>in vivo</i>
Abstract	<b>Theranostics</b> as the modern strategy of curing means combining possibilities of a drug to concentrate in disease focus, visualize it (diagnostics) and to have a desirable selective effect on it (therapy). We synthesized a novel <b>gadolinium complex of porphyrazine</b> which demonstrated the selective accumulation in tumor that was indicated by higher fluorescence intensity in the tumor area in comparison with the normal tissues. The results of MRI <i>in vivo</i> showed that this agent provided significant contrast enhancement of the tumor. Photodynamic therapy of the mouse carcinoma with this agent has been demonstrated <i>in vivo</i> . The tumor was irradiated by yellow 593 nm laser light with 100 mW/cm <sup>2</sup> irradiance and exposure time of 30 min in the 10th day of growth. The agent caused moderate inhibition of tumor growth, with more pronounced difference from untreated tumor on day 21 after tumor inoculation. The treated tumor was two times less in volume than the untreated one.

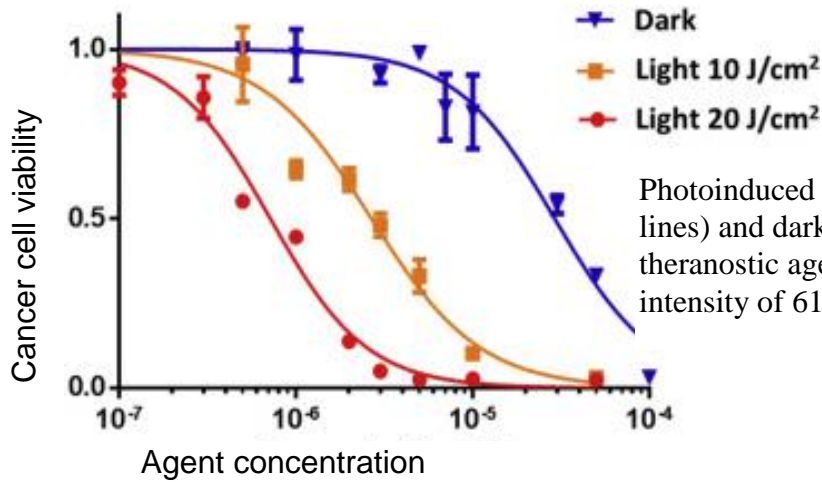
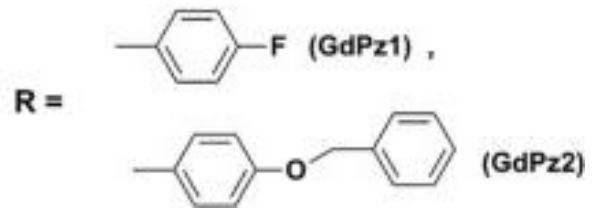
Representative articles 2017-2018, quartiles	1. <i>Yuzhakova D.V., Lermontova S.A., Grigoryev I.S., Muravieva M.S., Gavrina A.I., Shirmanova M.V., Balalaeva I.V., Klapshina L.G., Zagaynova E.V. In vivo multimodal tumor imaging and photodynamic therapy with novel theranostic agents based on the porphyrazine framework-chelated gadolinium (III) cation. Biochimica et Biophysica Acta (BBA) - General Subjects. 1861(12), 3120-3130 (2017).</i>	Q1, Q2
Q-index (Qi) for the result		<b>3.5</b>

**medial blue**

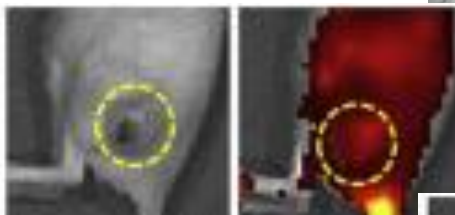
In collaboration	Privolzhsky Research Medical University, Nizhny Novgorod 603005, Russia Razuvaev Institute of Organometallic Chemistry RAS, Nizhny Novgorod 603950, Russia
------------------	---



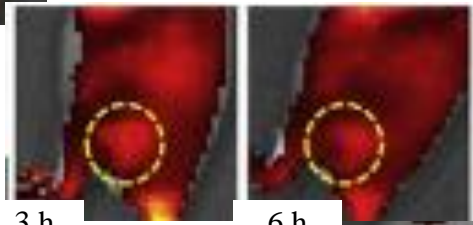
Two variants of theranostic agent (GdPz1 and GdPz2) which differ by pyrrole complexes.



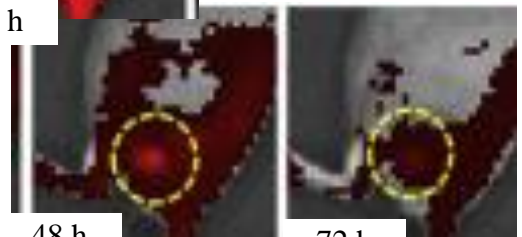
Photoinduced toxicity *in vitro* (red and orange lines) and dark toxicity (blue line) of theranostic agent GdPz2 under different light intensity of 615-635 nm waveband.



Control 15 min



3 h 6 h



48 h 72 h

Accumulation of the agent in tumor and **cancer cells death** *in vivo*. Tumor and normal tissue areas are marked by a yellow circle.