



# Photochemistry School 2020

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## New acyclic diaminocarbenes cycloplatinated(II) complexes: synthesis, photophysical properties and cytotoxic activity

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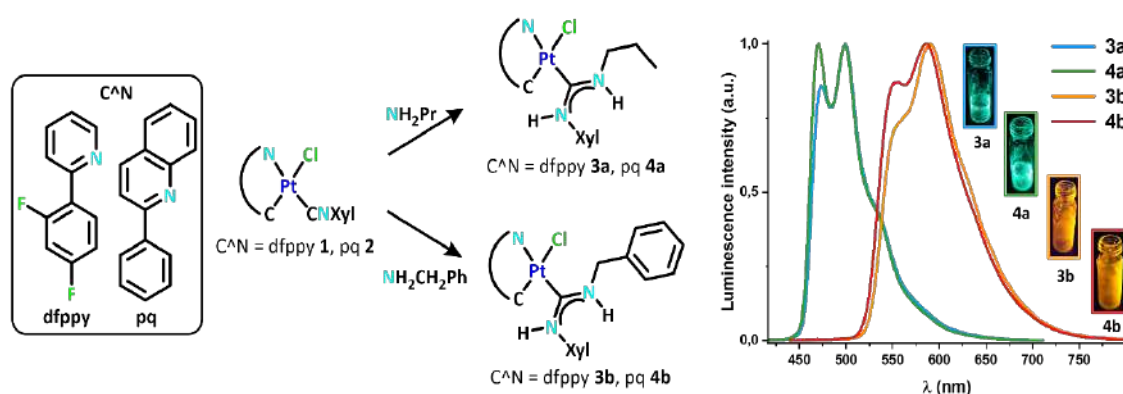
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Among all phosphorescent molecules, cyclometalated platinum(II) complexes have received considerable attention because of their photophysical properties and potential applications as dopants in OLEDs, LECs, photocatalysts or bioimaging. Another research of relevant interest is their employment as anticancer drugs with a broader spectrum of action against different tumours and fewer side effects than the well-known cisplatin. For that reason, the choice of the cyclometalated group and ancillary ligands play an important role not only in emissive behavior but also on the biological activity.<sup>1</sup>

N-acyclic diaminocarbenes (ADCs) show several appealing characteristics; they display strong electron-donating ability with structural flexibility and can be easily prepared. However, there are only a few examples of ADC-platinum complexes used as perspective metal-based drugs in the literature.<sup>2</sup>

In this contribution, we describe a series of new luminescent ADC cycloplatinated(II) compounds featuring 2-(2,4-difluorophenyl)pyridine (**3**) and 2-phenylquinoline (**4**) cyclometalated groups [Pt(C<sup>^</sup>N)Cl{C(NHXyl)(NHR)}] (R = Pr **a**, Benzyl **b**) obtained by nucleophilic addition of primary propyl and benzyl amines, to the isocyanide ligand of the corresponding precursors [Pt(C<sup>^</sup>N)Cl(CNXyl)] (**1**, **2**) recently reported by our group.<sup>3</sup> Their optical properties have examined and interpreted with the aid of DFT/TD-DFT calculations and, finally, all new compounds have been screened for their cytotoxic activity against various cancer cell lines.



**Figure 1.** Scheme of the synthesis and selected emission spectra of all compounds in 5% PS.

<sup>1</sup> P. Zhang, P. J. Sadler. *J. Organomet. Chem.*, **2017**, 839, 5-14.

<sup>2</sup> T. V. Serebryanskaya, M. A. Kinzhalov, et al., *New J. Chem.*, **2020**, 44, 5762-5773.

<sup>3</sup> M. Martínez-Junquera, R. Lara, E. Lalinde, M. T. Moreno, *J. Mater. Chem. C*, **2020**, 8, 7221-7233.