Short Communication International Journal of Bioassays 2021
Vol.10 No.5

Pharmaceutical Chemistry & Pathology Congress 2019: Novel series of cyano-aryl porphyrazines with benzyloxy and propargyl substituents in peripheral aryl fragments for specifically personalized medicine: Optical viscosity sensing and PDT treating - Larisa Klapshina - Lobachevsky State University of Nizhny Novgorod

Larisa Klapshina
Lobachevsky State University of Nizhny Novgorod, Russia

For a long time the idea of separated diagnostic and therapeutic approaches was predominant in the development of new drugs in medicine. However, recently a significant increase has been observed in the trend to create drugs which effectively combine diagnostic and therapeutic approaches.

Such the drugs termed the agents of theranostics allow to determine the tumor localization in the body and to provide a therapeutic effect on it. Furthermore, in some cases theranostic agent allows to provide the real time monitoring of individual therapeutic response to the treatment procedure.

Recently we reported on the preparation and studies of the photophysical properties of new fluorescent porphyrazine pigments which have been found to be an excellent platform for drugs with the unique combination of various biomedical functions: bimodal (fluorescent/ MRI) diagnostic agents, sensitive optical sensors of intracellular viscosity and highly efficient photosensitizers in photodynamic therapy. Here we report the new series of aryl-cyano porphyrazine pigments containing n-donor oxygen atoms in the aromatic groups of peripheral frame of tetrapyrrol macrocycle (Fig.1).

They demonstrate significantly improved photocytoxic properties and the potential for biomedical application as photosensitizers in PDT in comparison with previously reported arylcyano porphyrazine Pz1. Moreover, this series of tetrapyrrols the structural feature of which is the alternation of strongly electron withdrawing CN and π-donor aryl groups in the peripheral frame of macrocycle have been found to be novel fluorescent molecular rotor type dyes with the desirable feature of intense absorption and emission of red light that can be useful in vivo to enable deep tissue penetration in the ‘tissue optical window’.

High efficacy of all the series as the fluorescent sensors of local viscosity in a wide viscosity range, had been demonstrated. Furthermore, we first proposed semiempirical model describing photophysical behavior of novel porphyrazine series. The model was verified with fluorescence decay investigations for all the porphyrazine series, T.

This work is partly presented at Joint Event on 12th International Conference on Pharmaceutical Chemistry & 2nd European Pathology Congress
May on 20-21, 2019 Berlin, Germany