

Xanthene dyes: Old scaffold offering new possibilities

Peter Šebej

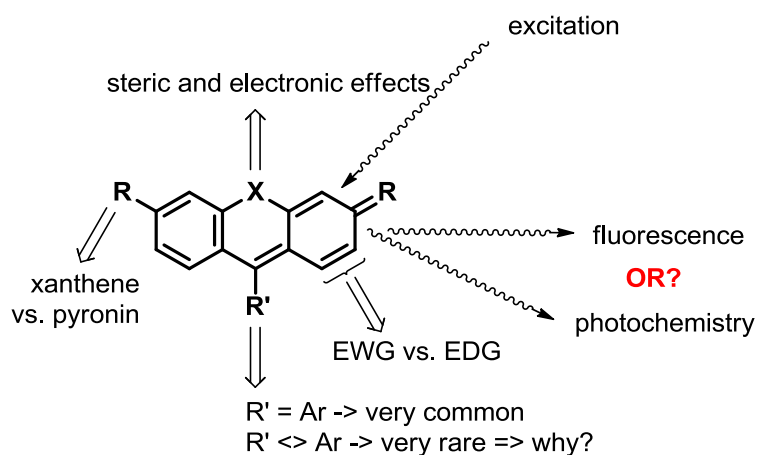
RECETOX and Department of Chemistry, Faculty of Science, Masaryk university

sebej@mail.muni.cz

Since the von Bayer synthesis of fluorescein in 1871 the synthetic dyes emerged as one of the most successful fields of chemistry. Small molecule organic fluorophores are now essential tools in molecular biology, medicine and material science. But the xanthene scaffold could also be turned into a photoactivatable system allowing release of caged substrates as diverse as carboxylates, phosphates and CO – all biologically relevant molecules.

In addition the xanthene moiety could be modified on four principal positions – two of them are very well mapped, while the influence of the various functionalities positioned in the other two are not so well explored. Our journey on mapping these unexplored areas of chemistry will be discussed with the following examples: 9-Imido-pyrone analogues - small-molecule fluorophores with large Stokes shifts and 9-Phenylethylene-pyrone analogues – dually addressable fluorophores.

The build chemical library of xanthene dyes also allows us to understand the structure-properties relationship within the old xanthene scaffold and rationally design new xanthene analogues and fine-tuning their photophysical properties.



References

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