Photochemistry of Bilirubin Dipyrrinone Subunits

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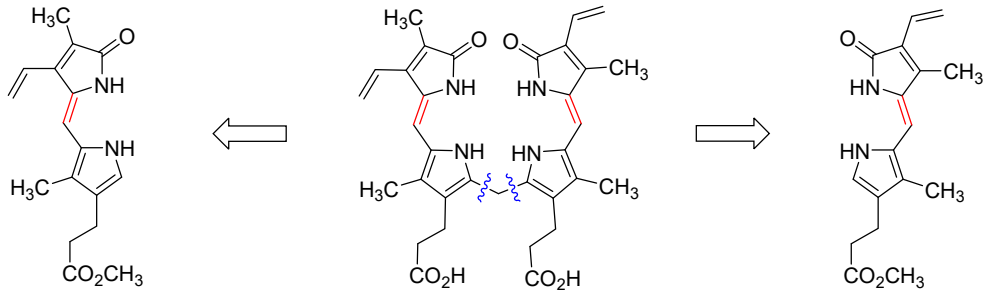
Bilirubin (BR) is an essential metabolite formed by the catabolism of heme. Phototherapy with blue-green light can be applied to reduce high concentrations of BR in blood, especially in the neonatal period.[1] In our work, we studied the photochemistry of both bilirubin dipyrrinone subunits (**1** and **2**, prepared as the corresponding methyl esters) by steady-state and transient spectroscopies.[2,3] Bilirubin subunits represent useful models to study of the complex photochemistry of bilirubin. Both subunits undergo efficient reversible photoisomerization ($\Phi_{ZE} \sim \Phi_{EZ} \sim 0.15–0.30$), furthermore, *E*-**1** undergo lumirubin-type photorearrangement to form a seven-membered ring system. The cyclization process is significantly less efficient ($\Phi_c \sim 0.001–0.07$), but is strongly wavelength-dependent.

The photochemistry of bilirubin dipyrrinone subunits and its biological properties are discussed and compared to those of bilirubin.



Z-**1** (*Z*)-vinylneoxanthobilirubic acid methyl ester

(4*Z*,15*Z*)-Bilirubin IXα

Z-**2** (*Z*)-isovinylneoxanthobilirubic acid methyl ester

[1] Vítek, L.; Ostrow, J. D. *Curr. Pharm. Des.* **2009**, *15*, 2869.

[2] Madea, D. *et. al. J. Org. Chem.* **2020,** *85*, 13015.

[3] Janoš, J.; Madea, D. *et. al. J. Phys. Chem. A.* **2020**, *124*, 10457.