Photochemistry of Bilirubin Dipyrrinone Subunits

<u>Dominik Madea</u>, ¹⁾ Jiří Janoš, ²⁾ Taufiqueahmed Mujawar, ¹⁾ Aleš Dvořák, ³⁾ Lucie Muchová, ³⁾ Petra Čubáková, ⁴⁾ Miroslav Kloz, ⁴⁾ Petr Slavíček, ²⁾ Jakub Švenda, ¹⁾ Libor Vítek, ³⁾ Petr Klán¹⁾

¹⁾ Department of Chemistry and RECETOX, Faculty of Science, Masaryk University, Kamenice 5/A8, 625 00 Brno, Czech Republic, email: dominik.madea@seznam.cz
²⁾ Department of Physical Chemistry, University of Chemistry and Technology, Technická 5, 16628 Prague 6, Czech Republic.³⁾ Institute of Medical Biochemistry and Laboratory Diagnostics, 1st Faculty of Medicine, Charles University, Na Bojišti 3, 121 08 Praha 2, Czech Republic.⁴⁾ Institute of Physics of the Czech Academy of Sciences, ELI Beamlines, Za Radnicí 835, 252 41 Dolní Břežany, Czech Republic

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)-vinylneoxanthobilirubic acid methyl ester

(Z)-isovinylneoxanthobilirubic acid methyl ester

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