

Sensitive fluorescence-based detection of magnetic field effects in photoreactions of flavins

Emrys W. Evans, Jing Li, Jonathan G. Storey, Kiminori Maeda, Kevin B. Henbest, P. J. Hore, Stuart R. Mackenzie* and Christiane R. Timmel*

*To whom correspondence may be addressed: stuart.mackenzie@chem.ox.ac.uk or christiane.timmel@chem.ox.ac.uk

Electronic Supplementary Information

Analysis of flavin photoproducts by mass spectrometry

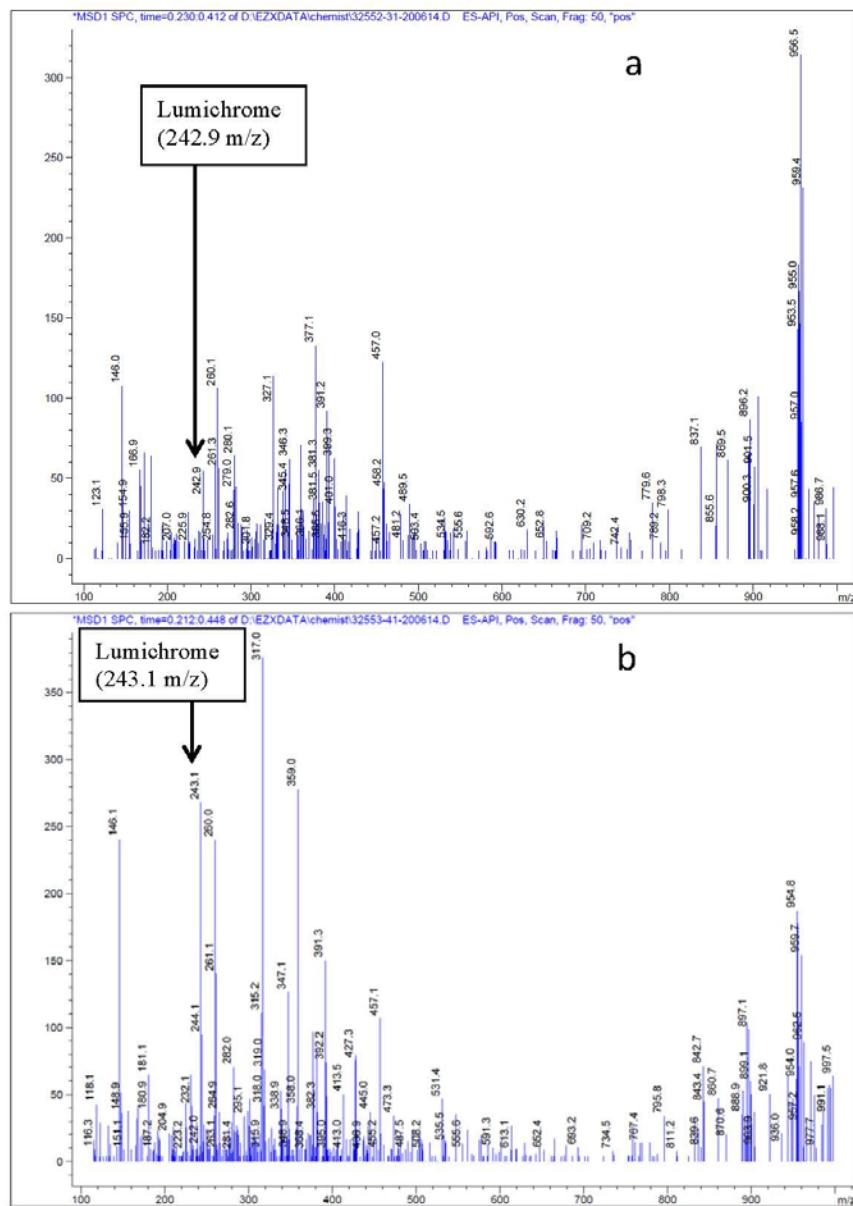


Fig. S1: Mass spectra before, a), and after, b), a PF MARY experiment on a static (non-flowing) sample of 10 μ M FMN + 0.5 mM HEWL, showing an increase in lumichrome content resulting from continuous photoexcitation by a 405 nm diode laser at 350 mW. Spectrum a) suggests that lumichrome is present as a minor impurity in commercial FMN. The spectra were recorded using a positive electrospray ionization Waters Premier LCT mass spectrometer.

Hypothesis testing for *AtCry1* MFEs

Band-averaging over the wavelength range 500-600 nm with $B_0 = 12.2$ mT gives an MFE of $0.034\% \pm \text{S.E. } 0.007\%$ for *AtCry1* (see main text, figure 10).

A two-tailed hypothesis test of this result for the null hypothesis, $H_0 : \text{MFE} = 0$, and the alternative hypothesis, $H_1 : \text{MFE} \neq 0$ yields a test statistic of 4.9 with a p -value < 0.001 (assuming a normal distribution for the variance in the data as the number of measurements $>> 30$). Hence, the null hypothesis is rejected in favour of the alternative hypothesis that there is a MFE on the prompt fluorescence of the sample at the 99.9% significance level.