

THREE-COLOR PHOTOPHARMACOLOGY

CHROMATICALLY ORTHOGONAL VISIBLE-LIGHT PHOTOCAGES FOR OPTICAL CONTROL OF THE α_{1A} ADRENERGIC RECEPTOR

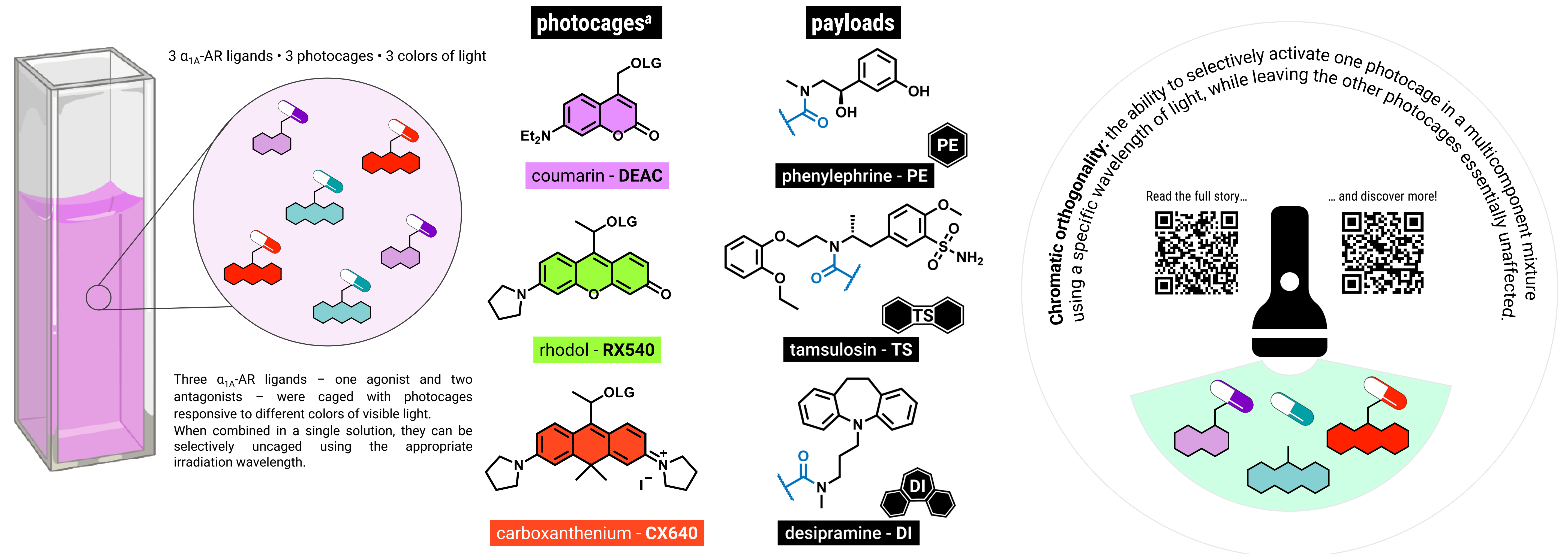
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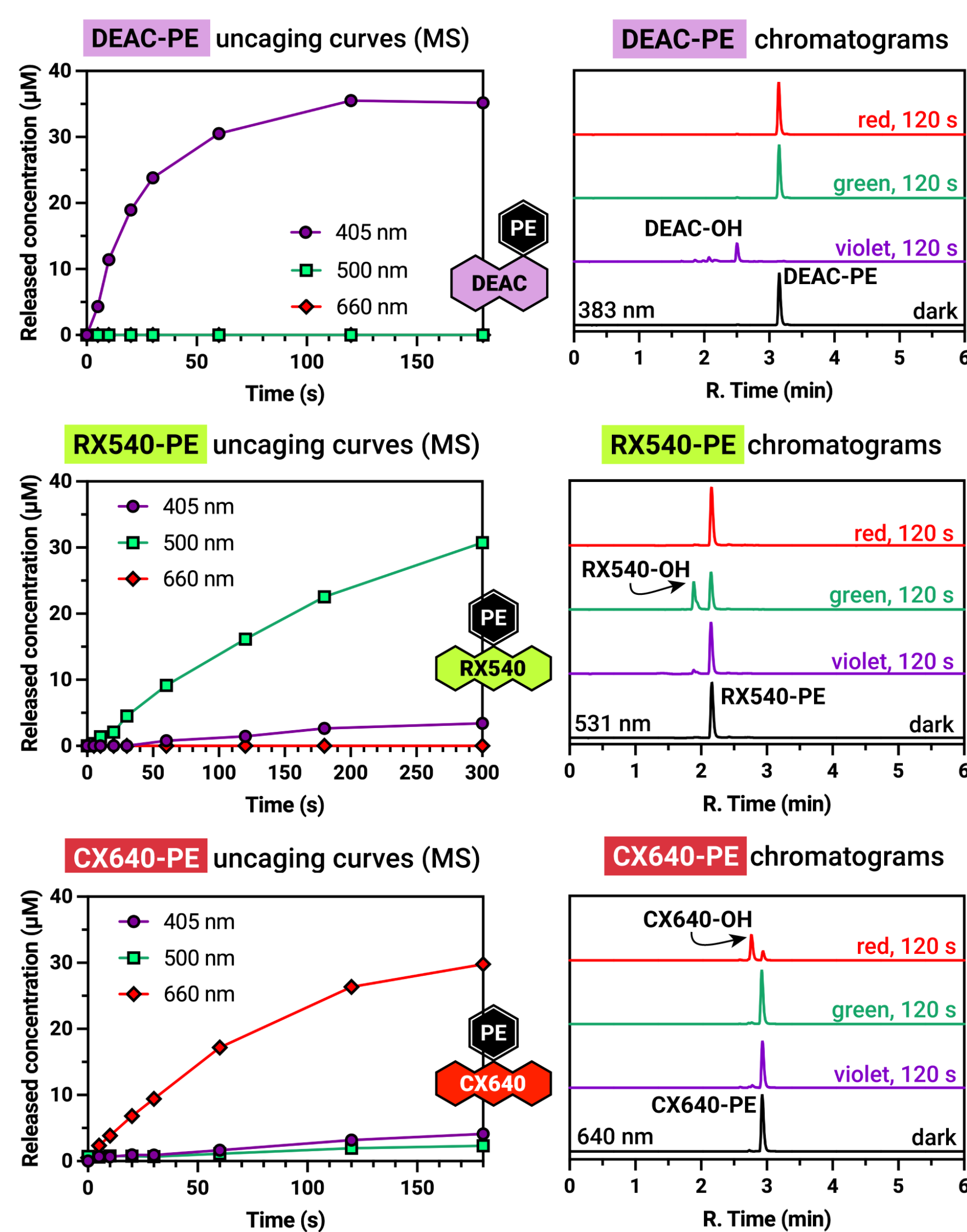
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CONCEPT

A three-color photocage system enables **selective** and **sequence-independent** payload release using visible light.



SINGLE COMPOUND IRRADIATION



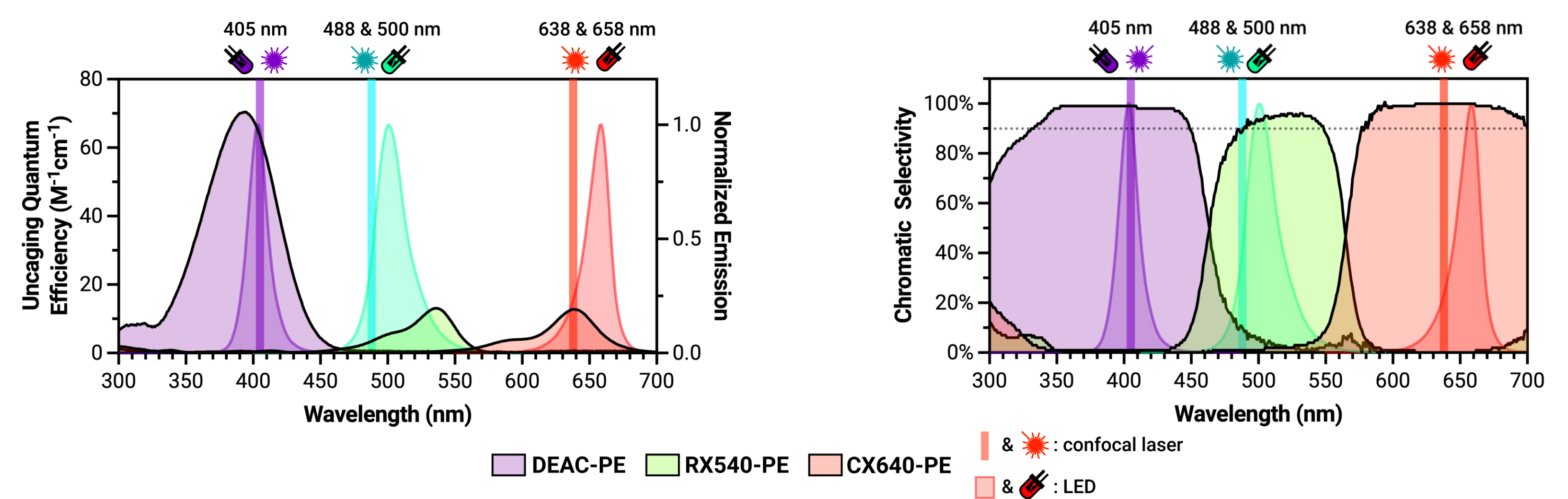
PHOTOCHEMICAL CHARACTERIZATION

Chromatic selectivity^b:

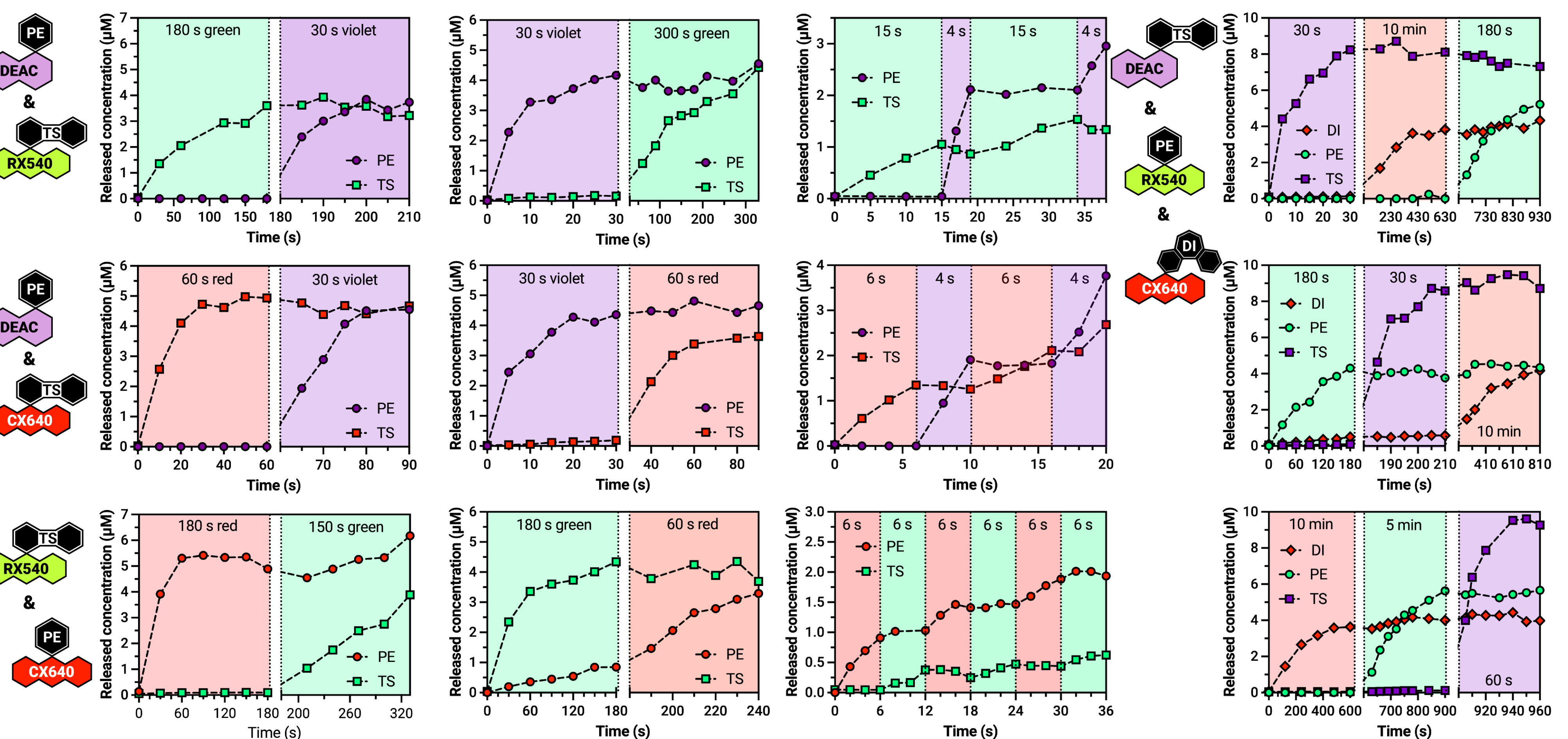
The selectivity of a given wavelength for the desired photocage in a mixture.

$$\eta_i(t, \lambda) = \frac{c'_i(t)}{\sum_j c'_j(t)} \quad \text{Calculated for } t=0: \eta_i(0, \lambda) = \frac{\epsilon_i(\lambda) \cdot \Phi_{u,i} \cdot c_i}{\sum_j \epsilon_j(\lambda) \cdot \Phi_{u,j} \cdot c_j}$$

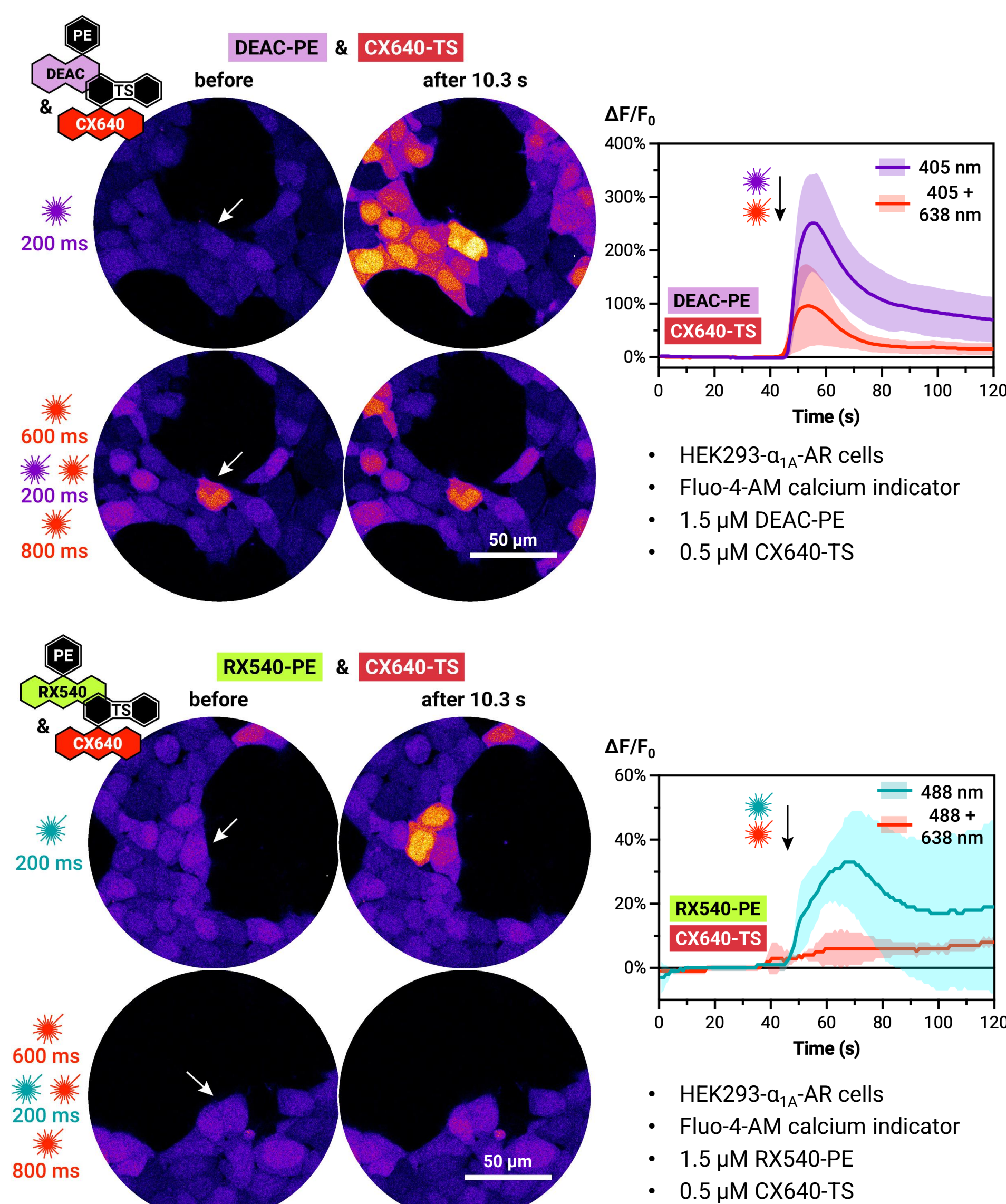
Chromatic selectivity > 90%: **chromatic orthogonality**



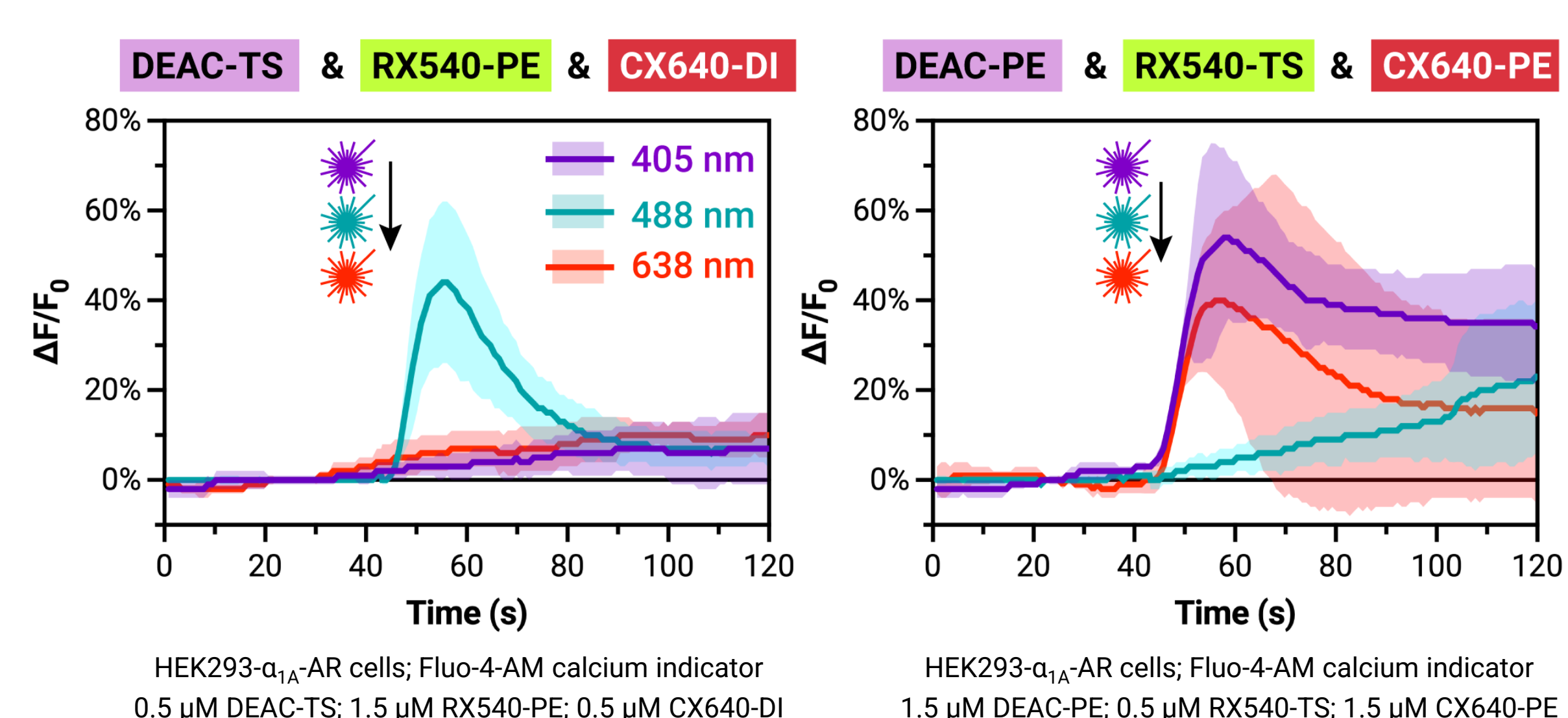
MULTICOMPONENT IRRADIATION



GPCR MODULATION IN CELLS



THREE-COLOR UNCAGING IN CELLS



ACKNOWLEDGEMENTS



^a Egyed, A. et al. *J. Am. Chem. Soc.* **2023**, 145 (7), 4026–4034.
^b Kaufmann, J. et al. *Chem. Eur. J.* **2023**, 29 (17), e202204014.