

## Phenylazothiazole (PAT) – Based Photoswitches as Promising Candidates for Biological Applications

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**Keywords:** Phenylazothiazole; Photoisomerization; Hetero-Azobenzenes; Visible Light, Photoswitches

Photoswitches are a class of compounds that when irradiated with light of a suitable wavelength change their structural and chemical properties producing another isomer. The two isomers can be inter-converted either by the irradiation of the light of a suitable wavelength or by thermal activation.

Photoswitches are often tethered to functional molecules to reversibly regulate their material or biological functions.<sup>1</sup> However, for biological applications, a photoswitch undergoing isomerization under ultraviolet (UV) light is not conducive as UV light is detrimental to the cells and possesses poor tissue penetrating power.

In our previous report, we successfully employed the pyridine-substituted PAT molecule as a visible-light controllable (405 nm and 525 nm) Rho kinase inhibitor.<sup>2</sup> This result prompted us to further modify the ‘PAT’ core to generate photoswitches, that can be switched using longer visible wavelengths of light. Herein, we present a new class of photoswitches based on a phenylazothiazole (PAT) scaffold that can be reversibly isomerized using visible wavelengths of light and possess a thermal lifetime of their *cis* isomer ranging from several seconds to several minutes (Figure 1).

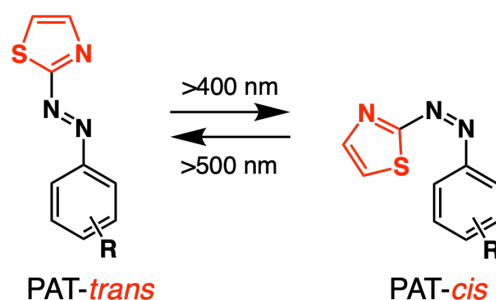


Figure 1. New class of compounds based on phenylazothiazole (PAT) - scaffold undergoing reversible isomerization under visible light irradiation.

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- 2) K. Matsuo, S. Thayyil, M. Kawaguchi, H. Nakagawa, N. Tamaoki, *Chem. Commun.* **2021**, 57, 12500.