Bridged-Isoindigo Third-Generation Molecular Motors

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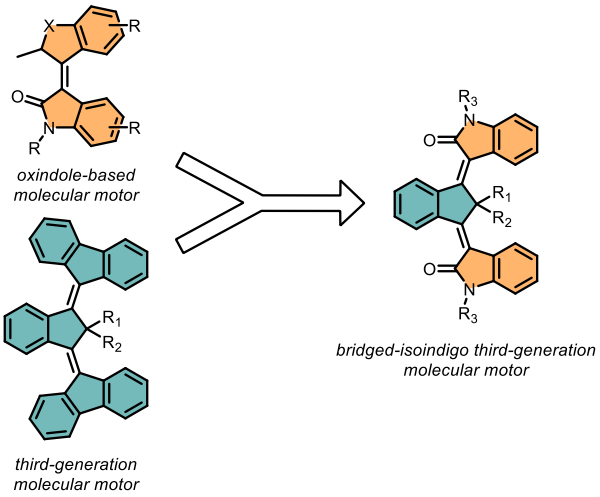

Figure 1. *The new light-driven molecular motor design.*

Oxindole-based motors are visible light-driven molecular motors which can be readily synthesised through a Knoevenagel-type condensation.[1,2] Third-generation light-driven motors possess two rotors that rotate in opposite directions with respect to the central core. This inherent feature together with their exceptionally fast speed of rotation make third-generation motors very attractive for applications such as cargo transport and locomotion.[3-5] To elevate the associated challenging synthesis and limited solubility, a new type of motor was designed which incorporates oxindole rotors (Figure 1). The resulting motor is expected to be accessible in a straightforward and modular manner, to allow for easy functionalisation at the oxindole moieties, and to possess a higher solubility in common organic solvents. A double Knoevenagel-type condensation proved to be a successful strategy to attach both oxindole-derived rotors in a single step. However, optimisation of the condensation step is required to improve the yield of the motors. The motors were studied by UV/Vis absorption spectroscopy which revealed the generation of an identical PSS starting from the (*E,E*)-isomer and the (*E,Z*)-isomer. Further experiments will be performed to support the unidirectional rotation of these bridged-isoindigo motors.

[1] Roke *et al. J. Am. Chem. Soc.* **2019**, 141, 18, 7622–7627.
[2] Pooler *et al. Chem. Sci.* **2021**, 12, 7486–7497.
[3] Kistemaker *et al*. *Nat. Chem.* **2015** 890–896.
[4] Kistemaker *et al*. *J. Am. Chem. Soc*. **2017**, 139, 28, 9650–9661.
[5] Berrocal *et al. J. Org. Chem.* **2020**, 85, 10670–10680.