

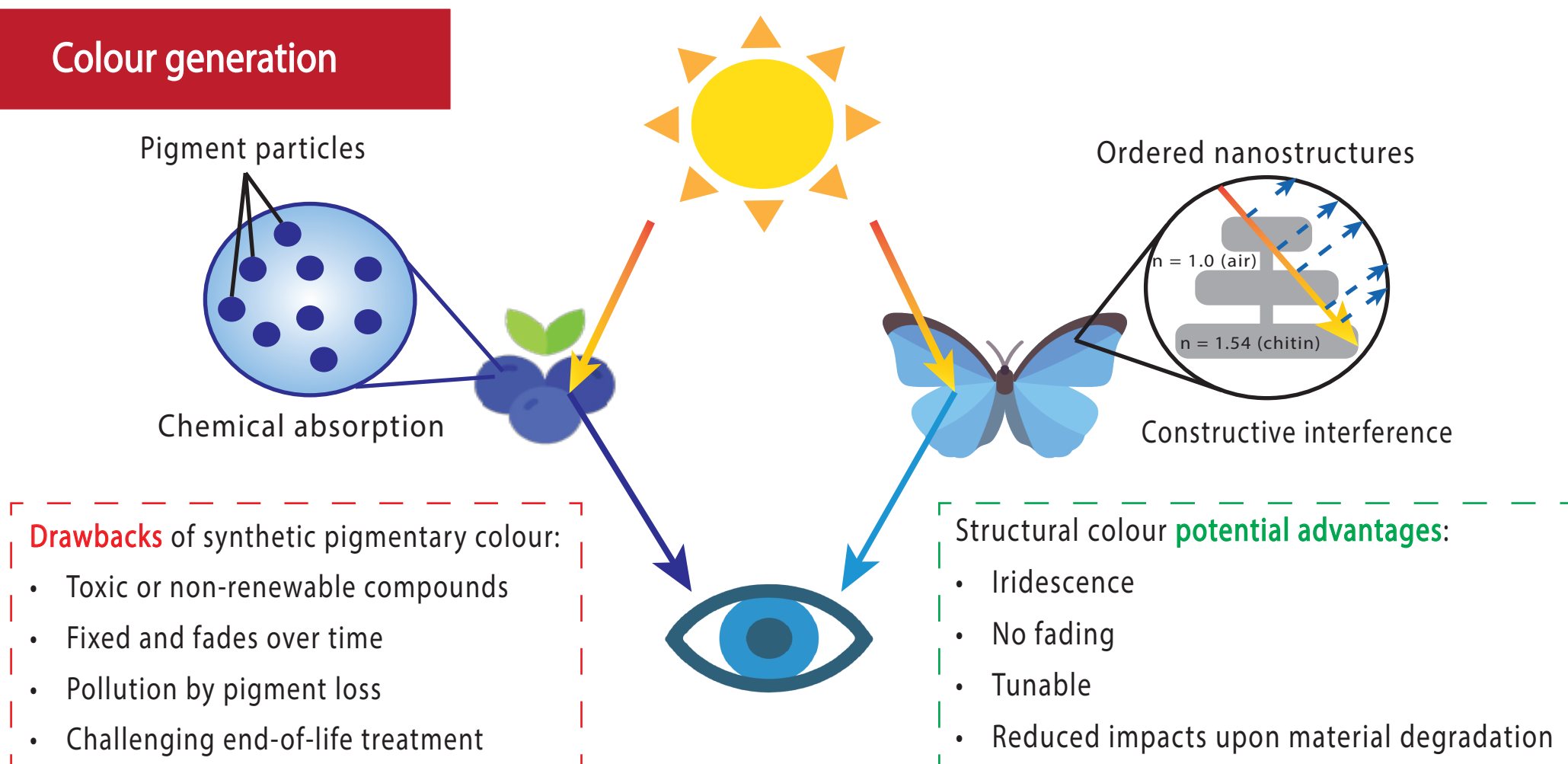
Bio-based structural colours: from novel synthetic strategies to structural control via processing

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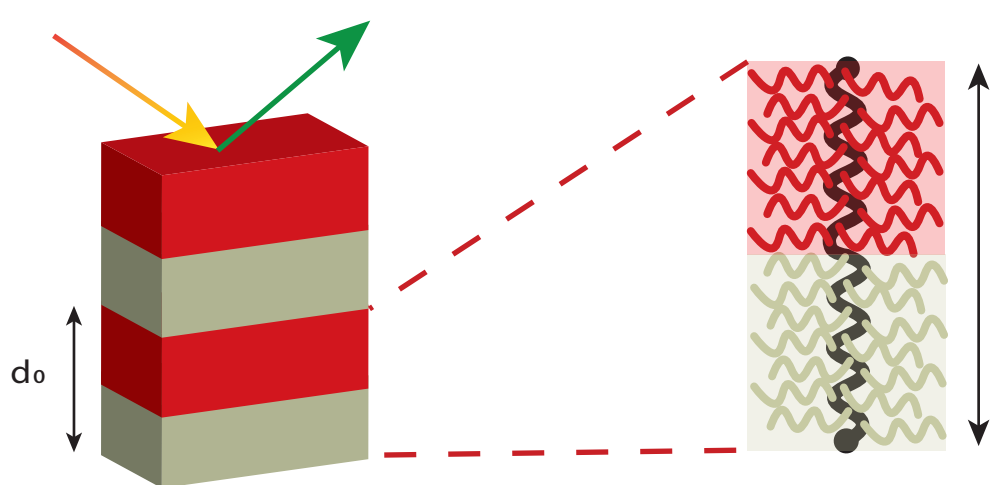
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Colour generation



Can we produce structural biocolour inexpensively?



Interplanar distance

$$d_0 = \chi^\alpha N^\beta$$

$$n\lambda = 2d_0 \sin\theta$$

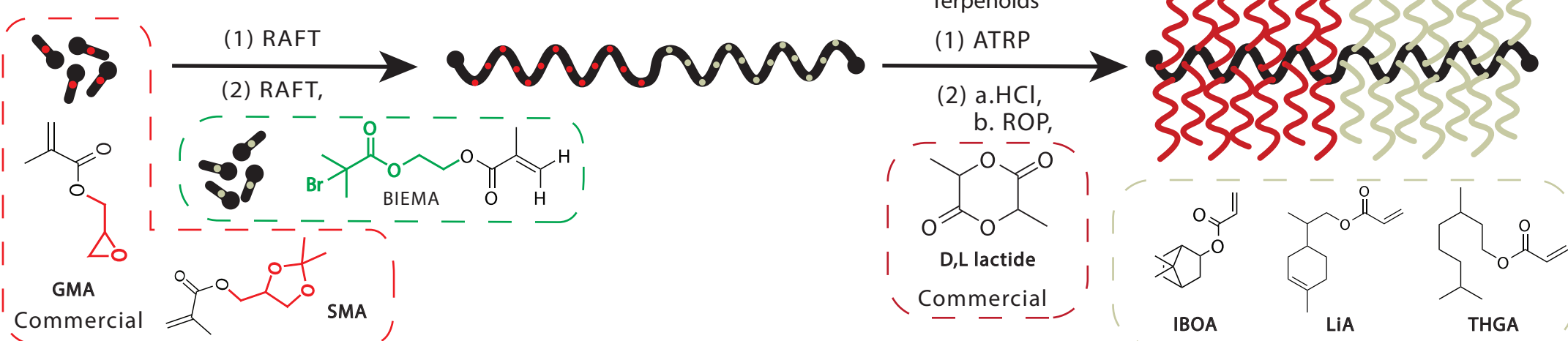
Colour is a function of:

1. Degree of polymerization (N)
2. Incompatibility of the side chains (X)
3. Grafting density
4. Angle of reflection (θ)

Photonic Crystals (PhCs) from bottlebrush block-copolymers (BB-BCPs) self-assembly

- Rapid self-assembly
- Inexpensive
- Bio-based

Current synthesis method - Grafting from



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References:

- [1] Liberman-Martin; et al.; Macromolecular Rapid Communications, vol. 38, no. 13, p. 1700058, 2017.
- [2] Verduzco, R.; et al.; Chem. Soc. Rev., vol. 44, no. 8, pp. 2405–2420, Apr. 2015.
- [3] Bauer, N.; et al.; ACS Sustainable Chem. Eng., vol. 5, no. 11, pp. 10084–10092, Nov. 2017.
- [4] Doi, N.; et al.; Journal of Polymer Science, vol. 62, no. 7, pp. 1310–1322, 2024.



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