

How butterflies, beetles and flowers will inspire next-generation materials

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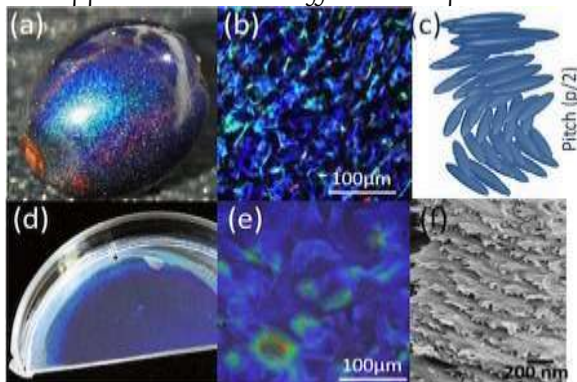
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Look the world around you, it is full of colours and we wonder “Why?” The colouration in the world probably evolved with the evolution of the vision by different species and has important functions in terms of camouflage, mating, signal transmission, *etc.* While studying the colouration mechanisms can provide deep insights into evolutionary adaptations for biologists, understanding the chemical and structural organisations in nature, can inspire the next generation smart materials with different colourful functionalities.



In the Bio-inspired Functional Materials Group led by Dr Dumanli-Parry, we study the materials optimized for their environment and multifunctionality. The surface and nanostructure of butterflies beetles and plants are amazingly designed through evolution and helping us to find creative solutions for big engineering problems. Just take a look at the Morpho butterfly wing; it is designed for flying yet it does so much more than that! The striking blue colour of the Morpho butterfly is signalling the rest of the butterflies like a blinking alarm, also the surface features of the butterfly makes it water repellent which makes the butterfly wings antimicrobial.

Our approach combines different disciplines such as chemistry, biology, physics and materials. We specifically use



self-assembly and self-organisation of materials in nanoscale to build high-quality sensors, diagnosis tools, optical devices and photo active catalysis for water cleaning and Hydrogen fuel production with an additional goal to answer fundamental questions about the biological relevance and significance of evolution of these structures.