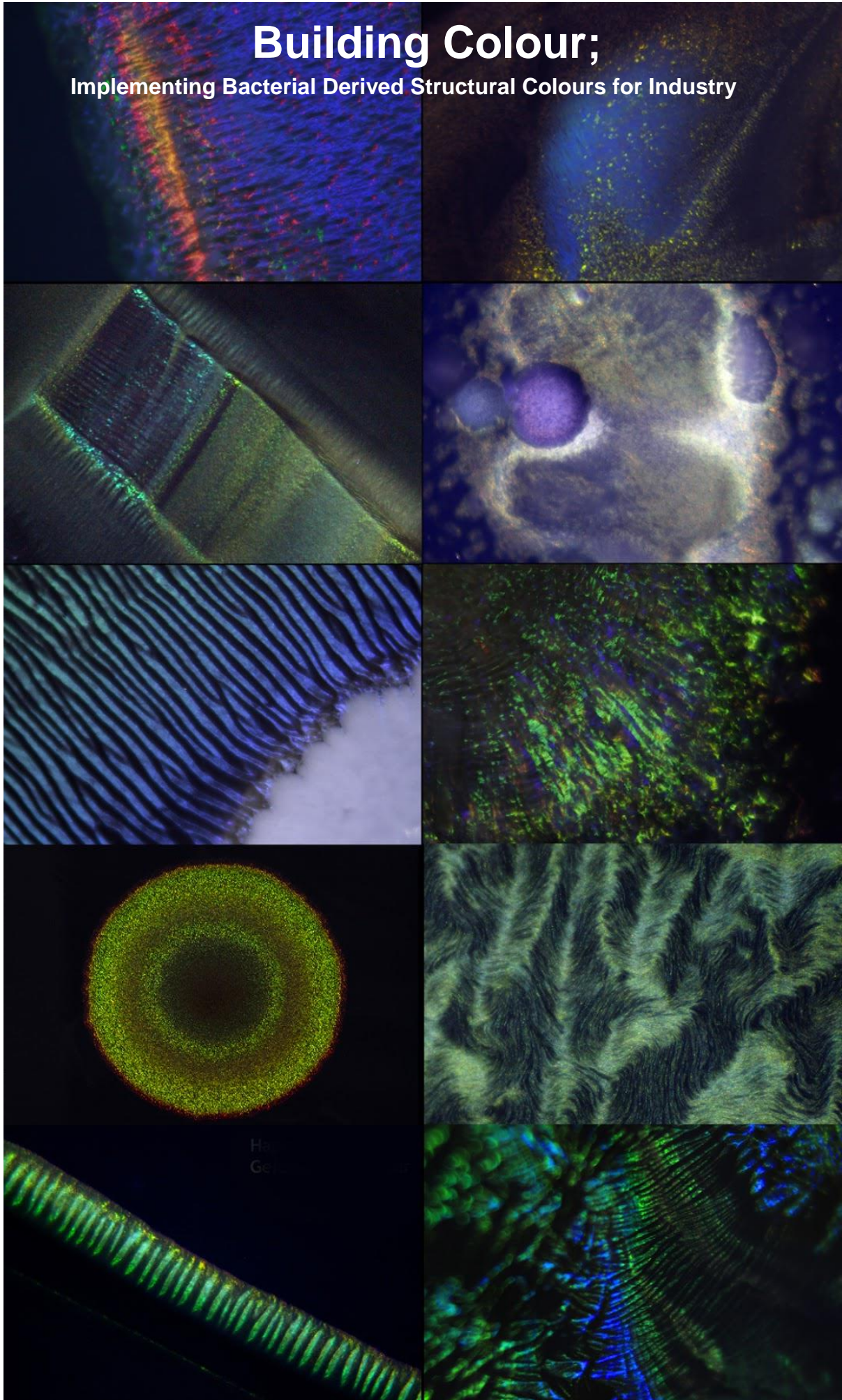


Building Colour;

Implementing Bacterial Derived Structural Colours for Industry



RAAK PRO Building Colour; Implementing Bacterial Derived Structural Colours for Industry

Abstract

Colour, in the form of pigments and dyes, is vital to many major industries: notably the paint and dye markets (>110 billion Euros per year), textiles (multitrillion Euros), cosmetics, printing and high-tech sectors. Industry and the consumer demand cost effective and high-performance colours. This is in conflict with societal desire for sustainability – with biobased, non-toxic, non-wasteful (in terms of energy, water and petroleum) products.

Currently, the choice of biodegradable colours is limited. Limiting factors are lack of variety in colour, colour intensity and stability, toxicity and sustainability (natural is not always good). Biobased Structural Colours may provide solutions to these limitations.

Bacteria will be applied for the conversion of low-value, organic biomass into high-value, high-performance, sustainable, coloured biomaterials. The discovery of *Flavobacteria* that spontaneously organize to create structural colour (SC) makes this route both innovative and feasible. Bacterial SC is similar to the mechanism by which the feathers of the peacock create brilliant, iridescent colours. SC uses nanotextured surfaces that interact with light in specific and tunable ways. In nature, SC has superior properties and diversity compared to current man-made SCs.

It is intended to create a road- for manufacturing bacterially-derived SC (BDSC). This will be achieved through 1) the incorporation of BDSC in biobased substrates, 2) creating bacterial strains more suitable for SC production and 3) the creation of SC containing prototypes in which SC are incorporated. The end result; the availability of tangible examples of the brilliantly coloured biomaterials with potential for the dye industry. SC will be actively promoted to gain widespread acceptance by the public, policy makers, industry and investors.

Active partners: Hogeschool Utrecht, Hoekmine, Zuyd Hogeschool, Saxion Hogeschool, University of Maastricht, Wageningen University & Research Center, Miscancell, Holland Colours, Lamoral Coatings, ANL Plastics, Officina Corpuscoli, Cambridge University, Wim van Egmond, Protospace Foundation, Slim².