

FUNCOLOR: FUNGAL-BASED PRODUCTION OF MELANIN AS A BIOLOGICAL REPLACEMENT FOR CHEMICALLY SYNTHETIC GREY-BROWN-BLACK DYES

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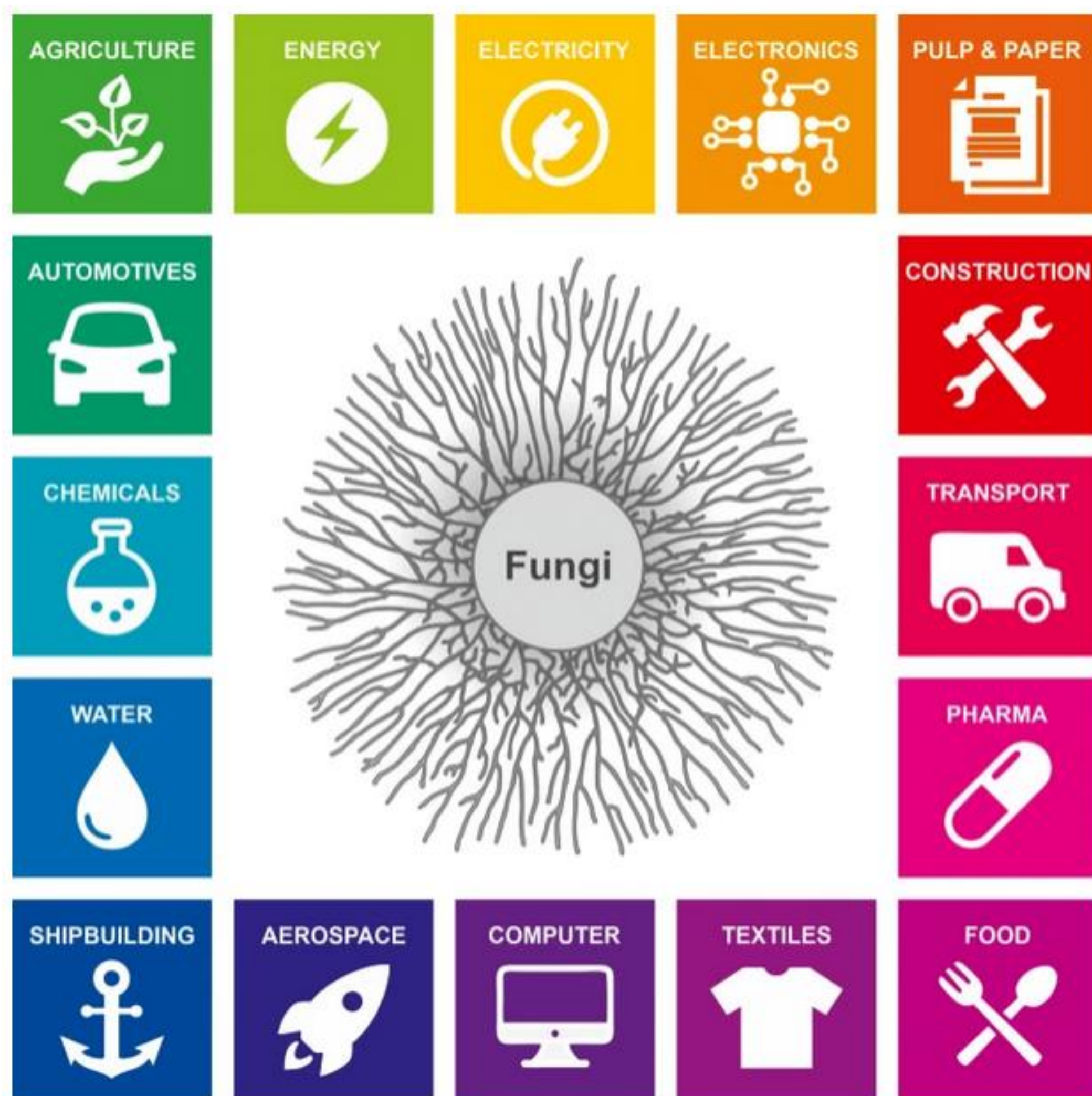


Figure 1: Industries that utilize fungi or their products. Fungi are able to recycle a diverse range of industrial, agricultural, and other waste into useful molecules. This includes medicines, foods, enzymes, platform chemicals and pigments. Figure taken from (1)

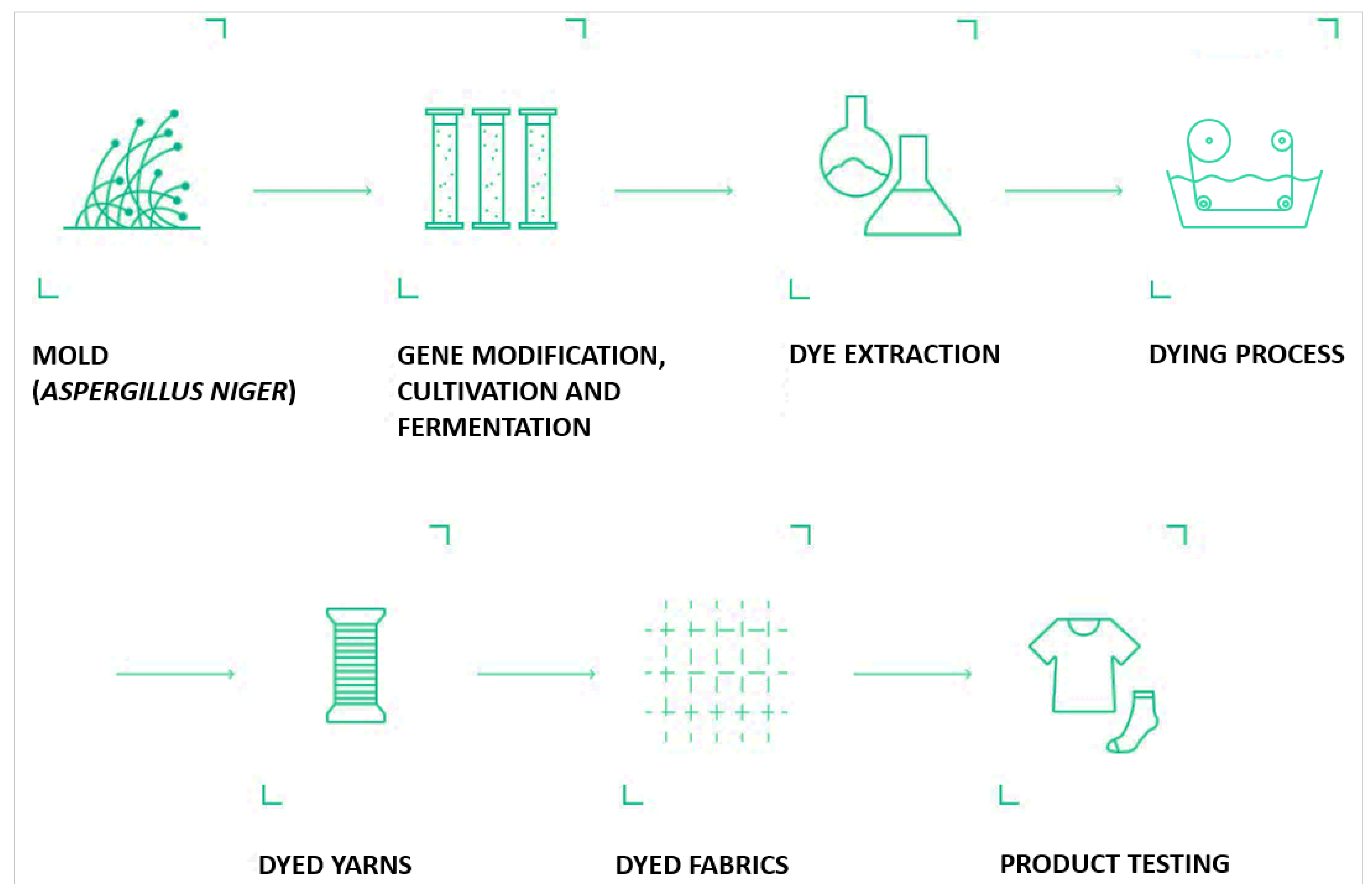


Figure 2: Schematic diagram of project objectives. This project harnesses molecular engineering to build a next generation cell factory that is hyper-efficient at pigment production. This is coupled with applied science in the textile industry to test the derived pigment.

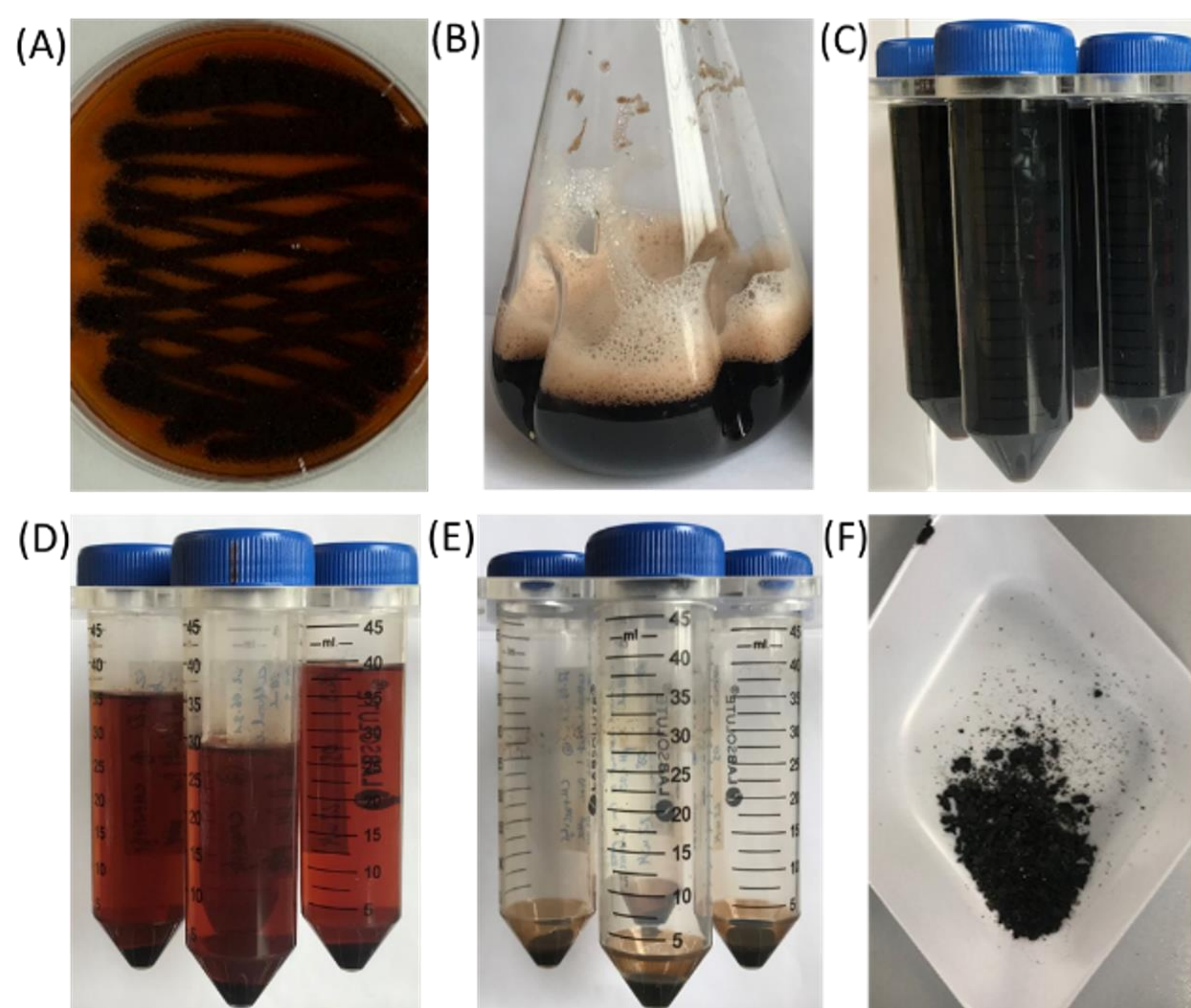


Figure 3: Production of purified extracellular pyomelanin. (A) Growth of a genetically engineered *A. niger* strain which produces increased pyomelanin. Note visible melanin excretion in the culture medium. (B) Cultivation of the strain in liquid culture. (C-E). Extracted pyomelanin pigment (F) Figure partially taken from (2)



Figure 4: The next frontier of fungal science. Bio-based pigments are the focus of the FunColor project- but what other revolutions are promised by applied fungal biology? The exhibit “Closer to Nature” at Berlinische Galerie Museum of Modern Art (16.2.24-14.10.24) is showcasing how architecture can also be bio-based and de-carbonized. Shown is the experimental building MY-CO SPACE (2021, MY-CO-X), which is built from fungi and is totally sustainable. Images taken from (3).

(1) Meyer et al. Growing a circular economy with fungal biotechnology: a white paper. *Fungal Biol Biotechnol* 7, 5 (2020).

(2) Koch, Meyer et al. *Aspergillus niger* as a cell factory for the production of pyomelanin, a molecule with UV-C radiation shielding activity. *Front Microbiol* 14 (2023)

(3) <https://berlinischegalerie.de/en/exhibitions/current/closer-to-nature/>

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