

# Photosynthetic bacteria in the synthesis of dopamine-based polymers

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The self-polymerization of dopamine in aerobic and anaerobic environment is investigated in presence and in absence of growing purple non sulfur photosynthetic bacterial strain *Rhodobacter sphaeroides* (*R. sphaeroides*) R-26, which is able to growth in a medium both aerobic and photoheterotrophically.

Dopamine (DA) is a neurotransmitter that self-polymerizes into polydopamine (PDA), a synthetic analogue of melanin [1] of great interest in organic and bioinorganic electronics.

To study how the photosynthetic bacterium affects polymerization, dopamine solutions were initially studied in bacterial culture medium exposed to light under aerobic and anaerobic conditions confirming that oxygen acts as a catalyst for the self-polymerization of DA.

In a second set of experiments, dopamine DA monomers were added to the biological feeding medium along with a bacterial inoculum [2, 3] and exposed to light under anaerobic conditions as previously reported [4, 5] to assess the role of the bacterial cells on the PDA formation.

Spectroscopic characterization was used to show that, in absence of oxygen, *R. sphaeroides* acts as a catalyst for the PDA formation.

## References

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