Photo-electrochemical Communication between 
*Rhodobacter capsulatus* and Electrode for 
Harnessing Solar Energy

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All forms of life require energy that originates from the sun via a naturally tuned process called photosynthesis. Higher plants, algae and photosynthetic bacteria convert solar energy into organic chemical energy. Photo-microbial fuel cells can be exploited to meet the growing demand for sustainable energy [1]. The metabolically versatile purple *R. capsulatus* is a potential candidate to study the electrogenic activity in the presence of light. The use of flexible osmium redox polymers gained attention for their efficient electron transfer properties both with redox enzymes [2] and with bacterial cells [3, 4] including heterotrophically grown *R. capsulatus* [5]. In this communication, photo-heterotrophically grown *R. capsulatus* cells electrostatically bound in the osmium polymer matrix demonstrated efficient electrical “wiring” with the electrodes and were able to generate a significant current ≈10 µAcm⁻² with malate/lactate as substrate. The cells trapped in the polymer matrix were exited with visible light and the subsequent photosynthetic electron transfer takes place onto the electrode recorded in both chronoamperometric and cyclic voltammetric measurements. In addition to the photocurrent generation, this study demonstrates the development of the possibility of other photo-bioelectrochemical devices based on *R. capsulatus*.