

## **Rapid and quantitative assessment of redox conduction across electroactive biofilms by using double potential step chronoamperometry**

The mechanism of electron transport across anodic electroactive biofilms (EABs) is of high interest and still a matter of debate. Quantitative assessments of their redox conduction take considerable time and require non-turnover conditions (absence of substrate), which can be detrimental to the EABs. Here we measured the charge transport parameters of *Geobacter* spp. dominated EABs by performing double potential step chronoamperometry (DPSC) followed by Cottrell analysis. The DPSC measurement is simpler and much faster than usual techniques and allows the determination of the charge transport parameters even under turnover conditions. The electrochemical responses were well-described by a model of redox conduction only driven by electron diffusion within the EAB. The apparent diffusion coefficient for the electron ( $D_{app}$ ) was measured at  $3.2 \times 10^{-7} \text{ cm}^2\text{s}^{-1}$ , a value similar to those recorded for pure *Geobacter sulfurreducens* EABs, or for some redox polymers with comparable concentrations of redox centers. This method will be valuable for assessing the impact of EAB characteristics and environmental factors on charge transport ability of the biofilm, and for determining the rate-limiting step(s) for current production. (Xu Zhang et al., *ChemElectroChem*, 4, 2017).