Temporal-Spatial Changes in Viabilities and Electrochemical Properties of Anode Biofilms

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Figure S1. Nyquist plots of EIS spectra for the anodes of *G. anodireducens* SD-1 (a) and the mixed culture (b).

Figure S2. Equivalent circuit for anode EIS.
Figure S3. Linear sweep voltammetry (LSV, 1 mV/s) of Geobacter anodireducens SD-1 (a) and the mixed culture (b) over time; (c) and (d), first derivative analysis of LSV curves from (a) and (b) respectively.
Figure S4. The ortho images of anode biofilms obtained by using confocal laser scanning microscope (CLSM). Biofilms were LIVE/DEAD viability staining. Live cells were imaged
as green, while dead cells were imaged here as red. The images in the left side were the biofilms of *G. anodireducens* SD-1 operated in the 1(a), 5(c), 12(e) and 30(g) cycle, while images in the right side were the biofilms of mixed culture operated in the 1(b), 5(d), 30(f) and 60(h) cycle. The large panel (340 μm × 340 μm) was obtained by cutting the biofilm through the blue line (parallel to electrode). The top panel was obtained by cutting the biofilm through the green line (perpendicular to electrode). The left panel was obtained by cutting the biofilm through the red line (perpendicular to electrode).

**Figure S5.** The 3D metabolic-structure images of anode biofilms. Live cells were imaged as green, while dead cells were imaged here as red. (a) the biofilm of *G. anodireducens* SD-1 obtained in a two-chamber BES, (b) the biofilm of the mixed culture obtained in a two-chamber BES, (c) the biofilm of the mixed culture obtained in an air-cathode BES, (d) the biofilm of *G. sulfurreducens* PCA in a mini-BES operated under 0.7 V applied voltage.
Figure S6. Bacterial communities based on MiSeq Illumina Sequencing for the anode biofilm of the mixed culture operated for 30 batch cycles.