Abstract Submitted
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Residence-time analysis of *D. discoideum*-nanoelectrode contacts[1] BRET FLANDERS, PREM THAPA, Kansas State University — Electrode-cellular interfaces are critical features of electrophysiological devices. The present effort investigates the effect of small negative voltages applied to on-chip, polythiophene nanoelectrodes on the attachment of *D. discoideum* cells to the nanoelectrodes. The recently developed *directed electrochemical nanowire assembly* method has been used to grow polyethylene dioxythiophene (PEDOT) nanoelectrodes on microscopic electrode arrays. *D. discoideum* that are cultured on the arrays forage randomly in chemically and electrically isotropic environments and occasionally contact the polymeric nanoelectrodes. The distribution of residence times during which single cells were in contact with unbiased nanoelectrodes was measured. The statistics are Poisson with an average residence time of 250 s. The residence time-distribution for cells in contact with a -50 mV biased electrode is not Poisson, and the probability of observing a residence time greater that 250 s is significant. This effect will be discussed in light of recent evidence for the coupling of the seemingly disparate processes, cell-substrate adhesion and voltage-gated ion flux.

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