Induction of Electrode-Cellular Interfaces with $\sim 0.05 \ \mu m^2$ Contact Areas$^1$ BRET FLANDERS, PREM THAPA, Kansas State University — Individual cells of the slime mold Dictyostelium discoideum attach themselves to negatively biased nanoelectrodes that are separated by 30 $\mu m$ from grounded electrodes. There is a -43 mV voltage-threshold for cell-to-electrode attachment, with negligible probability across the 0 to -38 mV range but probability that approaches 0.7 across the -46 to -100 mV range. A cell initiates contact by extending a pseudopod to the electrode and maintains contact until the voltage is turned off. Scanning electron micrographs of these interfaces show the contact areas to be of the order of 0.05 $\mu m^2$. Insight into this straight-forward, reproducible process may lead to new electrode-cellular attachment strategies that complement established approaches, such as blind sampling and patch clamp.

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