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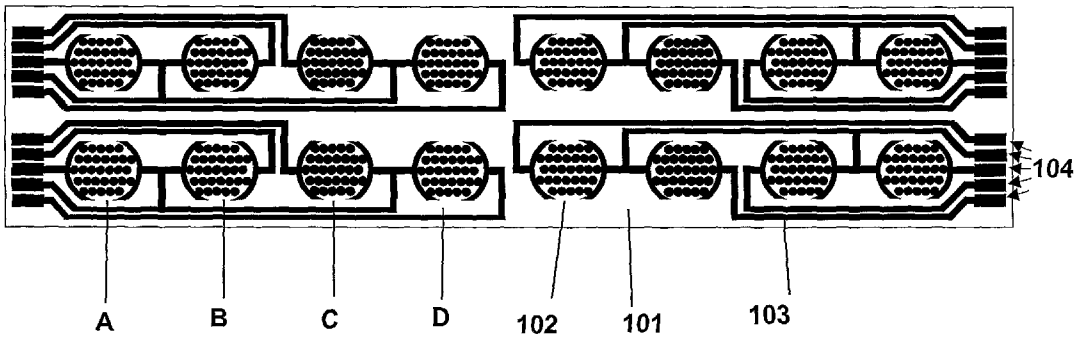

(57) Abstract: The present invention includes devices, systems, and methods for assaying cells using cell-substrate impedance monitoring. In one aspect, the invention provides cell-substrate impedance monitoring devices that comprise electrode arrays on a nonconducting substrate, in which each of the arrays has an approximately uniform electrode resistance across the entire array. In another aspect, the invention provides cell-substrate monitoring systems comprising one or more cell-substrate monitoring devices comprising multiple wells each having an electrode array, an impedance analyzer, a device station that connects arrays of individual wells to the impedance analyzer, and software for controlling the device station and impedance analyzer. In another aspect, the invention provides cellular assays that use impedance monitoring to detect changes in cell behavior or state.

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