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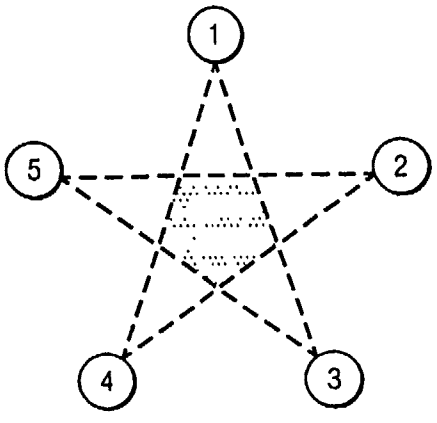
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(54) Title: ELECTRODE ASSEMBLY FOR CONSTANT-CURRENT ELECTROPORATION AND USE



(57) Abstract: The present invention relates to a modular electrode system, and its use, for facilitating the introduction of a macromolecule into cells of a selected tissue in a body or plant. The modular electrode system comprises a plurality of needle electrodes; a hypodermic needle; an electrical connector that provides a conductive link from a programmable constant-current pulse controller to the plurality of needle electrodes; and a power source. In a preferred embodiment of the present invention, an operator can grasp the plurality of needle electrodes that are mounted on a support structure and firmly insert them into the selected tissue in a body or plant. The macromolecules are then delivered via the hypodermic needle into the selected tissue. The programmable constant-current pulse controller is activated and constant-current electrical pulse is applied to the plurality of needle electrodes. The applied constant-current electrical pulse facilitates the introduction of the macromolecule into the cell between the plurality of electrodes. Cell death due to overheating of cells is minimized by limiting the power dissipation in the tissue by virtue of constant current pulses.

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