

Second Laureate Invention & Innovation



- **Research Work Title:**Electrical nanobiosensors for cancer diagnosis
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- **Collaborators:** Milad Gharooni & Mohammad Saeed Nikshoar
- **Collaborating Organizations:**Tehran University



Abstract:

Cancer cells are different from healthy cells in reproduction, adhesion, proliferation rate, maturation and function (specialization) which all might affect the electrical and chemical signals recorded from the cell. We developed nanostructured based electrical impedance sensor by silicon and carbon nanostructures as an instrument that detect the physiological state of the cell by measuring the dielectric parameters of the cells' membrane. Furthermore, effect of anticancer drugs on cancer cells could be electrically analyzed. great distinguishable patterns achieved between electrical responses of epithelial and mesenchymal cells in their various physiological states. Moreover, response of the cancer cells to anti cytoskeletal drugs were matched by their membrane dielectric parameters. Carbon nanotubes, Silicon nanowires and Silicon nanograsses on nanoroughened Silicon and glass substrates have been applied as sensing electrodes and impedance and phase values have been presented as electrical response patterns.

