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(54) Title: SYSTEMS AND METHODS FOR APTAMER-BASED INTRACELLULAR DELIVERY OF A PAYLOAD USING NANONEEDLES

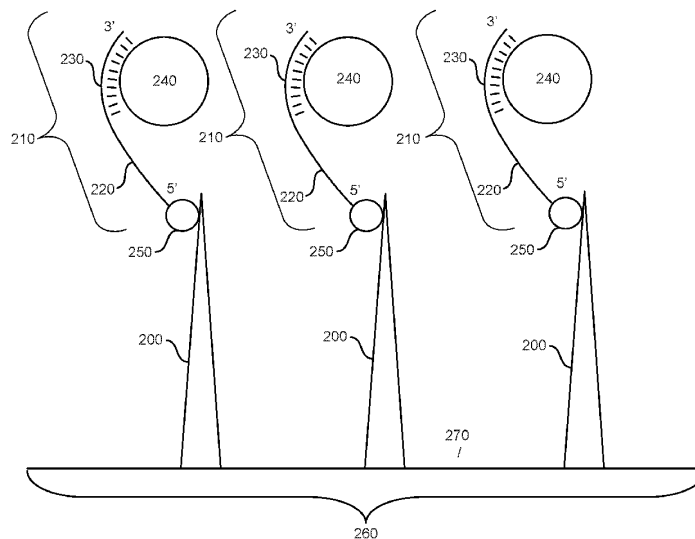


FIG. 2

(57) Abstract: Methods, chips and systems are provided for the ex vivo delivery of payloads into cells using an aptamer-based approach. Methods are provided for delivering a payload to a cell comprising providing a nanoneedle and a polynucleotide, wherein a first end of the polynucleotide comprises an aptamer capable of binding a molecule endogenous to a cell, wherein the first end of the polynucleotide is conjugated to the nanoneedle, and wherein a second end of the polynucleotide comprises an oligonucleotide capable of hybridizing with a payload; contacting the payload with the polynucleotide, wherein the payload contains a nucleotide sequence that is complementary to the oligonucleotide sequence; and inserting the nanoneedle into a cell, wherein upon insertion of the nanoneedle into the cell the payload is released from the polynucleotide.

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