Miniature Dexterous Manipulator for Therapeutic and Diagnostic Procedures in the Clinical Setting where Tool Access is Limited

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Technology description

Unmet Need:Next-generation surgical tools.
Technology Overview:
The technology is a dexterous manipulator less than 1 mm in diameter and 3 mm in length. It can be used as a procedural platform that can access narrow, tight, constrained or otherwise inaccessible spaces in the body in order to provide high dexterity that permits: the performance of diagnostic or therapeutic interventions including but not limited to drug delivery, biopsy, deployment of of other tools, positioning of active or passive secondary tools, and the performance of procedures that are made possible, safer or less invasive by use of the device. This sub-millimetric robotic snake that is capable of providing very high dexterity within a very compact form factor. The miniature dextrous manipulator has demonstrated the potential to enhance or enable diagnostic or therapeutic capabilities in ophthalmology. These applications can be further extended to include a wide range of diagnostic or interventional procedures. By way of example the miniature dexterous abilities can be used in the setting of ENT surgery including but not limited to sinus surgery, cochlear implant surgery, subglottic and vocal chord procedures and other. It is potentially useful in intracardiac surgery and other surgical procedures. Thanks to its large range of motion and compact form factor, it can provide tissue access at the optimal procedural angle in an otherwise constrained space. Whether the clinician needs to observe, to sample, deliver secondary technology or to directly manipulate the target tissue, this miniature dexterous device platform can provide access for the corresponding function, i.e., fiber optics, laser probe, illumination probe, biopsy mechanism, micro-cannula, surgical tools, drug device, stem cells, gene therapy, nanotechnology etc..

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