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Nanorobots –Applications in Medicine

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The automatic medicating systems are built in the human body through nano computer technology. It continuously monitors the stimuli being sent by various organs to brain through the nerves and instructs the nanorobots to penalize the disorder(s) if found. Nanorobots are some nano sized particles which can be accommodated inside the body at disease prone areas capable of delivering drugs for relevant diseases where they are poisoned and to take necessary action. Nanocomputers are nano sized computing devices aided with a nano memory chip, which are capable of communicating with the nanorobots and inhibit the contagious nature of the diseases. We use ultrasonic waves for interfacing between the nano devices which are found to be harmless to human structural organs. We proceed in a direction to analyze the major parts of the human body viz, the lungs, the heart, the kidneys, the liver etc,. We entrap the stimuli of these organs at vagus nerve which is used to communicate the message to brain regarding their status and hence the nanosensors are placed at their vicinity. These technologies are now under investigation and may act as revolutionized tools of future medical physiology.

The trend toward miniaturization in medical robotics has been gathering considerable momentum, and the potential impacts of this trend on the field of biomedicine are profound. Beyond the realm of macroscale medical robotics, the exploration of small-scale medical robotics, ranging from several millimeters down to a few nanometers in all dimensions, has intensified. These micro and nanoscale robots have been investigated for diverse biomedical and healthcare applications, including single-cell manipulation and

biosensing, targeted drug delivery, minimally invasive surgery, medical diagnosis, tumor therapy, detoxification, and more.

By providing innovative ways to interact with biological systems at the cellular level, nanorobots promise. To revolutionize various sectors of medicine, from diagnostics to treatment. The unique capabilities of nanorobots have opened up a new paradigm for problem-solving in biomedicine, enabling innovative approaches to challenges that were previously insurmountable. The potential to precisely manipulate. Biological materials at a cellular level has expanded the horizons of diagnostic and therapeutic procedures, bringing forth solutions that are more targeted, efficient, and minimally invasive.

Methodology

To obtain a comprehensive understanding of the applications and limitations of nanorobots in the medical field, we conducted a systematic review of the literature following the PRISMA (Preferred Reporting. Items for Systematic Reviews and Meta-Analyses) guidelines. Our review was carried out by two. Independent reviewers, each thoroughly examining the available literature. The objective of this process: was to identify research that provides information on how nanorobots are aiding advancements in the Medical field, such as through nano cell manipulation robots or micro-laparoscopic surgery. We did not set a date range for our literature search, thereby including the earliest relevant papers on the Topic to the most recent ones, aiming to capture the full development are of nanorobotics in medicine. The selection criteria necessitated the literature to be inclusive of both nanorobotics and medicine. Therefore, articles solely focusing on nanorobots without any direct medical applications, or articles strictly on the medical field without reference to nanorobots were excluded from our review.

Results

The stringent filtration process resulted in a final selection of 52 papers that fit our criteria. An analysis of these papers revealed

their focus on diverse subfields within the scope of nanorobotics in medicine. Specifically, 15 papers were dedicated to cancer-related research, 7 papers targeted cell, tissue, or organ treatment, 12 papers discussed surgical applications, 8 papers covered nanorobotic applications in drug delivery and 5 papers focused on applications in dentistry. Refer to Figure 1. The remaining papers consisted of general reviews on nanorobotics or tackled miscellaneous topics that could not be neatly categorized into any of the aforementioned areas.

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