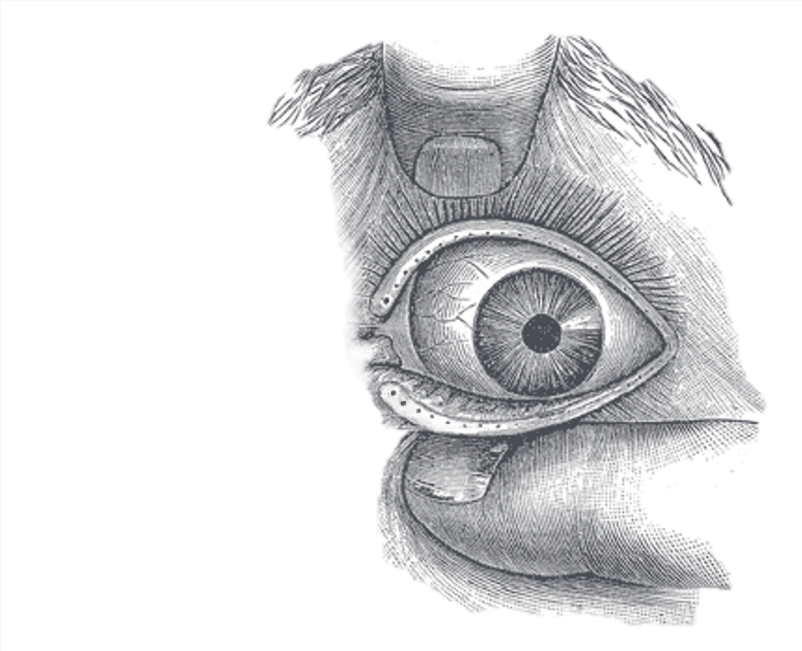
Unassisted Robotic Surgery Patent Issued with Promising Ophthalmic Potential

GREENSBORO, NORTH CAROLINA, UNITED STATES, May 31, 2023 /EINPresswire.com/ -- Unassisted Robotic Surgery Employing Paramagnetic Halo Metallofullerenes as Minimally Invasive, Precision Scalpels or Micronization Particles through Magnetic Field Manipulation and Targeted Exenteration Patterned by Programmed 3D Imaging Using Needle or Magnetic Energy Access and Microelectronic Semiconducting in Non-stationary Wafer-less Space (Patent No. 11,653,984), Brady, et.al., May 23, 2023.



Schematic representation of the eye and Meibomian gland with ductal orifices shown on the upper and lower eyelid. Image Source: Plate 1205 from Gray's Anatomy, by Henry Vandyke. Carter and Henry Gray (1918) (Modified); Source: Bartleby.com: Gray's Anatomy

AT Research Partners has been awarded a patent to combine magnetic forces with precision-guided nanoparticles for unassisted robotic surgery. The innovation encompasses atomic-scale fullerenes propelled and steered through intricate patient anatomy using external magnetic energy and real-time imaging. One ophthalmology embodiment of the invention would address the prevalent and chronic condition of dry eye disease.

Dry eye disease is associated with intricate anatomy that depends on delicate pathways that have long posed challenges for intervention with current methods for clearing blockages in the Meibomian glands, located along the edge of the eyelids. However, this robotic surgery invention promises an automated process for cleaning glands using biocidal nanoparticles to restore a healthy and natural flow of “meibum” necessary for ocular lubrication and comfort.

This eyecare application promises a routine procedure to extend treatment cycles for an

otherwise chronic disease. Ophthalmologists address common healthcare conditions and complaints that affect billions of patients worldwide during regular patient visits. Notably, approximately 30% of US adults seek eye care annually, with dry eye symptoms affecting upwards of 50% of them. Dry eye disease stands as one of the largest unmet and most common chronic conditions worldwide, lacking an effective treatment for many of its sufferers.

Taking surgery to the atomic level can also enable heretofore unrecognized capabilities and accuracy, allowing access to potentially inoperable spaces with traditional methods. With each application, less invasive approaches could reduce the risk of complications and improve patient outcomes. The patent protects fullerene nanoparticles when guided by external magnetic fields to create a quantum bridge over complex biology, circumnavigating organs and creating a surgical tool with unprecedented targeting and treatment accuracy potential.

The benefits of this invention extend beyond ophthalmology, with potential applications in many other areas of medicine. For instance, macro-surgical procedures that are prone to infections, such as orthopedic (synovial spaces) and gastrointestinal surgery may benefit particularly using biocidal, paramagnetic and incompressible fullerene properties that eviscerate pathogens upon contact yet cannot be contaminated due to atomic scale physics. The convergence of nanotechnology, magnetism, and atomic-scale physics promises a surgical tool capable of traversing the complexities of biology and revolutionizing the future of medicine.
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