Engineering in Nanospace
Semi-Finalist

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Image location: Digital creation

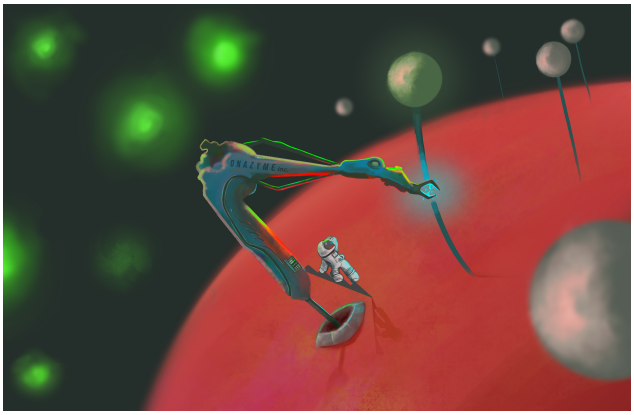

Image Description

Here, I've illustrated myself constructing a nanodevice called a "DNAzyme Walker" on the surface of a gold nanoparticle. The astronaut suit represents how, like astronauts who journey to outer space thousands of kilometers away in rockets, we navigate within nanospace, which is millions of times smaller than a centimeter, through chemistry and microscopy. Although the DNAzyme is synthesized with the biological material DNA, I've drawn the DNAzyme to be more machine-like to depict its mechanical function of cleaving nearby DNA. The strand the DNAzyme is cleaving is a string of DNA that tethers fluorophores to the surface of gold nanoparticles (which are redder when nanometers in size). Gold nanoparticles uniquely quench green fluorescence near its surface, which is why the tethered fluorophores are shaded grey in the illustration. After cleavage, the fluorophore is distanced from the nanoparticle and evokes a recordable fluorescence, represented by the green orbs in the background of the image. We designed this contraption to respond to cancer markers to release fluorophores or chemotherapies to both detect and destroy cancer cells.