Hybrid nanoparticles with Janus structure such as Au-SiO$_2$ nanoparticles have increased continuously as they bring the advantage of combining the properties of both gold and silica nanoparticles. This technique allows us to achieve directionality and self-propulsion by covering only a part of the spherical nanoparticle. This research proposes the study of a Janus Au-SiO$_2$ nanomotor driven by enzymatic reactions, to model the nanomotor chemotaxis in biological fluids. The purpose of this lies on a more significant screening of the nanomotors behavior in an *in vitro* environment for potential biomedical applications, such as biosensors, tumorigenic penetration, and drug delivery. In this experiment, 100nm and 500nm Janus Au-SiO$_2$ nanoparticles were synthesized. The selected enzymes where urease and glucose oxidase because of their high turnover number, which in terms of self-propulsion is translated at a higher diffusion rate. These Au-SiO$_2$ nanomotors demonstrate cell viability of 90% in concentrations of up to 4.5 mg/ml for 500nm Janus particles and 93% in concentrations of 3 mg/ml in 100nm Janus particles in HepG2 cells. Preliminary results suggest directional movement in concentration gradients of complementary substrate, urea, by the Janus nanomotors conjugated with urease. These experimental results will be used to properly develop and validate a theory to obtain the time correlations that govern this chemotaxis modeling process. Overall, insightful information about the biological effects of self-propelled nanoparticles for biomedical applications will be obtained including the features required for future devices to be fully biocompatible.