Simulation of a Nanoneedle for Drug Delivery by Using MATLAB Fuzzy Logic

Muhammad Javaid Afzal, The University of Lahore, Pakistan

Farah Javaid, Govt. Zamindar PG College Gujrat, Pakistan

Abstract (300 word limit)

The emerging technology of nanoneedle uses the nanoneedle for the penetration in cell membrane to investigate and manipulate biomedical procedures in the living cells. This study presents a simulated methodology on the basis of fuzzy logic for flow rate through a nanoneedle for drug delivery. The outflow rate is measured as 1.32 mL/min through MATLAB simulation. The measurements are verified by the Mamdani's model and the previous research. The simulated results given in this study specifies that the fuzzy logic deliver an effective modeling presentation by showing good agreement with the parametric measurements. Therefore, Fuzzy Logic is an alternate method to obtain outflow rate and other parameters for nanoneedles. This nanoneedle technology is revealed as a dominant and multipurpose technology. It can deal with many new customs to discover biomedical procedures with new bio-physical characteristics of the living cells.

Image

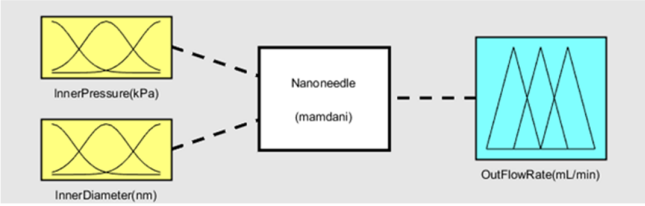


Figure 1 Fuzzy Logic Inference System

Recent Publications

1. Izumisawa, K., et al. *Plasmonic Au nano-needle fabricated by optical vortex laser illumination*. in *Optical Manipulation Conference*. 2017. International Society for Optics and Photonics.
2. Chiappini, C., *Nanoneedle-Based Sensing in Biological Systems.* ACS sensors, 2017. **2**(8): p. 1086-1102.
3. Yang, X., et al., *Dual-drug loaded nanoneedles with targeting property for efficient cancer therapy.* Journal of Nanobiotechnology, 2017. **15**(1): p. 91.
4. Wu, S., et al., *A green approach to dual-drug nanoformulations with targeting and synergistic effects for cancer therapy.* Drug delivery, 2017. **24**(1): p. 51-60.
5. Su, Y., et al., *A precision-guided MWNT mediated reawakening the sunk synergy in RAS for anti-angiogenesis lung cancer therapy.* Biomaterials, 2017.
6. Afzal, M.J., et al., *Simulation, Fabrication and Analysis of Silver Based Ascending Sinusoidal Microchannel (ASMC) for Implant of Varicose Veins.* Micromachines, 2017. **8**(9): p. 278.



Biography

Muhammad Javaid Afzal has his expertise in experimentation and simulation software (ANSYS and MATLAB) and their use in biomedical engineering for evaluation and passion in improving the health and wellbeing. His open and contextual simulation software based on responsive constructivists creates new pathways for improving healthcare. This approach is responsive to all stakeholders and has a different way of focusing.

Muhammad Javaid Afzal
Tel: +92-333-4326252
Session: Drug delivery research /Track no:11
Category: (Oral presentation)
Email: javaidphy@gmail.com

Notes/Comments: