

In-vitro studies of jet injections

☐ Search within citing articles

Jet injectors: Perspectives for small volume delivery with lasers

J Schoppink, DF Rivas - *Advanced drug delivery reviews*, 2022 - Elsevier

Needle-free jet injectors have been proposed as an alternative to injections with hypodermic needles. Currently, a handful of commercial needle-free jet injectors already exist. However ...

☆ Save  Cite Cited by 87 Related articles All 10 versions

Paperpile

Recent advances in micro-electro-mechanical devices for controlled drug release applications



LA Villarruel Mendoza, NA Scilletta... - ... in *Bioengineering and ...*, 2020 - frontiersin.org

In recent years, controlled release of drugs has posed numerous challenges with the aim of optimizing parameters such as the release of the suitable quantity of drugs in the right site at ...

☆ Save  Cite Cited by 64 Related articles All 9 versions 

Paperpile

Bubble dynamics and speed of jets for needle-free injections produced by thermocavitation



NE González-Sierra, JM Perez-Corte... - *Journal of ...*, 2023 - spiedigitallibrary.org

Significance The number of injections administered has increased dramatically worldwide due to vaccination campaigns following the COVID-19 pandemic, creating a problem of ...

☆ Save  Cite Cited by 17 Related articles All 11 versions

Paperpile

Feasibility of laser induced jets in needle free jet injections



P Rohilla, J Marston - *International journal of pharmaceutics*, 2020 - Elsevier

This paper reports a detailed characterization of laser-induced micro-jets, including ex vivo experiments using skin as a target substrate to check the feasibility in terms of needle-free ...

☆ Save  Cite Cited by 40 Related articles All 5 versions

Paperpile

Microfluidics control the ballistic energy of thermocavitation liquid jets for needle-free injections



L Oyarte Gálvez, A Fraters, HL Offerhaus... - *Journal of Applied ...*, 2020 - pubs.aip.org

Illuminating a water solution with a focused continuous wave laser produces a strong local heating of the liquid that leads to the nucleation of bubbles, also known as thermocavitation ...

☆ Save  Cite Cited by 38 Related articles All 11 versions

Paperpile

Impact of the mechanical properties of penetrated media on the injection characteristics of needle-free jet injection

A Mohizin, D Lee, JK Kim - *Experimental Thermal and Fluid Science*, 2021 - Elsevier

Needle-free jet injection systems are characterized by the increased drug delivery efficacy over conventional needle-based injection systems and have become a viable alternative ...

☆ Save  Cite Cited by 22 Related articles All 2 versions

Paperpile

Loading effects on the performance of needle-free jet injections in different skin models



P Rohilla, I Lawal, A Le Blanc, V O'Brien... - *Journal of Drug Delivery ...*, 2020 - Elsevier

Intradermal delivery of vaccines with jet injection is one of the alternatives to conventional delivery techniques with hypodermic needles via the Mantoux technique and multi-puncture ...

☆ Save  Cite Cited by 23 Related articles All 7 versions

Paperpile

Dynamic interaction of injected liquid jet with skin layer interfaces revealed by microsecond imaging of optically cleared ex vivo skin tissue model



A Mohizin, JH Imran, KS Lee, JK Kim - *Journal of Biological Engineering*, 2023 - Springer

Background Needle-free jet injection (NFJI) systems enable a controlled and targeted delivery of drugs into skin tissue. However, a scarce understanding of their underlying ...

☆ Save  Cite Cited by 5 Related articles All 11 versions

Paperpile

Electronic pneumatic injection-assisted dermal drug delivery visualized by ex vivo confocal microscopy



L Bik, MBA van Doorn, E Biskup... - *Lasers in Surgery ...*, 2021 - Wiley Online Library

Background and Objectives Electronic pneumatic injection (EPI) is a technique for dermal drug delivery, which is increasingly being used in clinical practice. However, only few ...

☆ Save  Cite Cited by 21 Related articles All 12 versions

Paperpile

Dispersion profile of a needle-free jet injection depends on the interfacial property of the medium



A Mohizin, JK Kim - *Drug Delivery and Translational Research*, 2022 - Springer

Injections into or through the skin are common drug or vaccine administration routes, which can be achieved with conventional needles, microneedles, or needle-free jet injections ...

☆ Save  Cite Cited by 10 Related articles All 3 versions

Paperpile

In-vitro studies of jet injections

☐ Search within citing articles

Experimental investigation on penetration performance of larger volume needle-free injection device

D Zeng, N Wu, L Qian, H Shi, Y Kang - *Journal of Mechanical Science and ...*, 2020 - Springer

The injection performance of a small volume of needle-free injection (up to 0.3 mL) has proven to be controllable and satisfactory in transdermal drug delivery. However, no ...

☆ Save  Cite Cited by 14 Related articles All 3 versions

Paperpile

Effect of orientation angle for needle-free jet injection

I Lawal, DCA Valente, E Khusnatdinov, B Elliott... - *International Journal of ...*, 2024 - Elsevier

In this paper, we report on the delivery efficiency of needle-free jet injections using injectors with typical jet speed $v_j \approx 140$ m/s, orifice diameter $d_o = 157 \mu\text{m}$, and volume $V = 0.1$ mL ...

☆ Save  Cite Related articles All 3 versions

Paperpile

Effect of nozzle shape and applied load on jet injection efficiency

W Tran, C Weeks, Y Rane, J Marston - *Journal of Drug Delivery Science ...*, 2023 - Elsevier

In this paper we present new results on jet injection with the overall aim of providing an efficient drug delivery into the intradermal region of the skin. To advance upon previous work ...

☆ Save  Cite Cited by 2 Related articles All 2 versions

Paperpile

Optimal standoff distance for a highly focused microjet penetrating a soft material

D Igarashi, K Kimura, N Endo, Y Yokoyama... - *Physics of ...*, 2024 - pubs.aip.org

A needle-free injector using a highly focused microjet has the potential to minimize the invasiveness of drug delivery. In this study, the jet penetration depth in a soft material ...

☆ Save  Cite Cited by 3 Related articles All 6 versions

Paperpile

Transient modelling of impact driven needle-free injectors

YS Rane, JO Marston - *Computers in biology and medicine*, 2021 - Elsevier

Needle-free jet injectors (NFJIs) are one of the alternatives to hypodermic needles for transdermal drug delivery. These devices use a high-velocity jet stream to puncture the skin ...

☆ Save  Cite Cited by 11 Related articles All 4 versions

Paperpile

A novel controllable pneumatic needle-free injection system for larger-volume drug delivery

D Zeng, N Wu, L Qian, H Shi, Y Kang - *Journal of Pharmaceutical Sciences*, 2020 - Elsevier

Hypodermic needles and syringes are currently the main route of the transdermal administration. Many complaints associated with needle-stick injuries, needle phobia, and ...

☆ Save  Cite Cited by 13 Related articles All 4 versions

Paperpile

Experimental investigation of the optimal driving pressure for a larger-volume controllable jet injection system

D Zeng, Z Tang, W Wang, Z Wang, J Li - *Medical Engineering & Physics*, 2023 - Elsevier

Jet injection technology has become the alternative drug delivery method of conventional needle-based injection due to its obvious advantages. In order to meet the demand for ...

☆ Save  Cite Cited by 1 Related articles All 3 versions

Paperpile

A comprehensive study on needle-free injection technology combined with midazolam nanosuspension

H Zhang, J Chen, X Han, L Xu, Z Wang, N Liu... - *Journal of Drug Delivery ...*, 2025 - Elsevier

Abstract Needle-Free Injection Technology (NFIT), which administers medication through a high-pressure transdermal jet, is limited to a delivery volume of no more than 1 mL due to ...

☆ Save  Cite Related articles

Paperpile

Needle-free Mental Incisive nerve block: in vitro, cadaveric, and Pilot Clinical studies

Q Gao, A Henley, G Noël, Z Der Khatchadourian... - *International journal of ...*, 2021 - Elsevier

The present study aimed to optimize Needle-Free Liquid Jet Injection (NFLJI) for Mental Incisive Nerve Blocks (MINB) and evaluate its clinical safety and feasibility. A MINB protocol ...

☆ Save  Cite Cited by 8 Related articles All 10 versions

Paperpile

Feasibility of using negative pressure for jet injection applications

YS Rane, JB Thomas, P Fisher, KE Broderick... - *Journal of Drug Delivery ...*, 2021 - Elsevier

We report on an experimental study of high-speed micro-scale liquid jets ejected into low-pressure environments, which has applications for the use of negative pressure modules in ...

☆ Save  Cite Cited by 6 Related articles All 2 versions

Paperpile

In-vitro studies of jet injections

☐ Search within citing articles

Design and analysis: Servo-tube-powered liquid jet injector for drug delivery applications

R Portaro, HD Ng - Applied Sciences, 2022 - mdpi.com

The current state of commercially available needle-free liquid jet injectors for drug delivery offers no way of controlling the output pressure of the device in real time, as the driving ...

☆ Save  Cite Cited by 3 Related articles All 6 versions 

Paperpile

Visualization of drug delivery via tattooing: effect of needle reciprocating frequency and fluid properties

I Lawal, P Rohilla, J Marston - Journal of Visualization, 2022 - Springer

Tattooing is a commonplace practice among the general populace in which ink is deposited within dermal tissue. Typically, an array of needles punctures the skin which facilitates the ...

☆ Save  Cite Cited by 6 Related articles All 4 versions

Paperpile PDF

Estimation of high-speed liquid-jet velocity using a pyro jet injector

N Takagaki, T Kitaguchi, M Iwayama, A Shinoda... - Scientific Reports, 2019 - nature.com

The high-speed liquid-jet velocity achieved using an injector strongly depends on the piston motion, physical property of the liquid, and container shape of the injector. Herein, we ...

☆ Save  Cite Cited by 3 Related articles All 8 versions

Paperpile

Effect of air pockets in drug delivery via jet injections

P Rohilla, E Khusnatdinov, J Marston - International journal of ..., 2021 - Elsevier

Needle-free jet injections are actuated by a pressure impulse that can be delivered by different mechanisms to generate high-speed jets ($V_j \sim 0-10\text{ m/s}$). During filling and ...

☆ Save  Cite Cited by 2 Related articles All 5 versions

Paperpile PDF

Liquid Needle Free Injectors: Design and Analysis of Power Sources

R Portaro - 2022 - spectrum.library.concordia.ca

Drug delivery without the use of hypodermic needles has been a long-term objective within the medical field. Although there exist many different needle free technologies, these have ...

☆ Save  Cite Related articles All 2 versions 

Paperpile

Termocavitación para la Generación De

CL de Alta Velocidad - 2024 - inaoe.repositorioinstitucional.mx

La administración de fármacos para la defensa del organismo contra infecciones o enfermedades constituye un pilar imprescindible en el área de la salud. En la actualidad, se ...

☆ Save  Cite Related articles 

Paperpile

SISTEMA DE INYECCIÓN SIN AGUJA POR ROMPIMIENTO DIELÉCTRICO DE AGUA NEEDLE-FREE INJECTION SYSTEM BASED ON DIELECTRIC ...

S Cruz, JM Pérez, C Martínez, R Ramos - [researchgate.net](#)

Los sistemas de inyección sin aguja han surgido como una alternativa prometedora a los métodos tradicionales de administración de medicamentos basados en agujas, ofreciendo ...

☆ Save  Cite Related articles 

Paperpile

Effect of air pockets in drug delivery in jet injections

P Rohilla, E Khusnatdinov, J Marston - [bioRxiv](#), 2021 - [biorxiv.org](#)

Needle-free jet injections are actuated by a pressure impulse that can be delivered by different mechanisms, and the resultant jets are (102) m/s. Here, we report on the effect of ...

☆ Save  Cite Related articles All 3 versions 

Paperpile

Needle-free liquid jet injection for dental anesthesia

Q Gao - 2022 - [escholarship.mcgill.ca](#)

Les systèmes d'Injection Sans Aiguille par Jet de Liquide (ISAJL) peuvent administrer un fluide thérapeutique dans le corps sans avoir recours à une aiguille. L'utilisation de ISAJL ...

☆ Save  Cite Related articles All 2 versions 

Paperpile

Mechanics of Needle-free Drug Delivery

A Henley - 2020 - [search.proquest.com](#)

Despite its long history and widespread applications, particularly for animal injections, needle-free pneumatic jet injection remains under-utilized in healthcare systems worldwide ...

☆ Save  Cite Related articles All 3 versions 

Paperpile

In-vitro studies of jet injections

☐ Search within citing articles

Ballistic Delivery of Microliquid Jets: Analysis for Drug Delivery

P Hankare, V Menezes

☆ Save  Cite Related articles

Paperpile