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Editorial

Methods of Micro and Nanofabrication

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EDITORIAL

Micro- and nanofabrication techniques have revolutionized the pharmaceutical and medical fields as they provide the likelihood for extremely consistent mass-fabrication of systems with advanced geometries and functionalities, together with novel drug delivery systems and bionsensors. The principal micro- and nanofabrication techniques square measure delineated, together with lithography, soft lithography, film deposition, etching, bonding, molecular self-assembly, electrically iatrogenic nanopatterning, speedy prototyping, and negatron, X-ray, mixture monolayer, and targeted particle beam lithography. Application of those techniques for the fabrication of drug delivery and bio sensing systems together with injectable, implantable, stratum, and mucoadhesive devices is delineated.

A notable example wherever these small devices give important benefits over ancient technologies is in medical aid. As an example, point-of-care diagnostic testing, that is testing performed at the patient's side, permits physicians to diagnose a patient's conditions faster than standard lab-based testing. By victimisation these devices to scale back the time to diagnoses, the doctor is ready to form higher patient management selections resulting in improved patient outcomes and scale back the general price of care. Advances in electronics and biosensor tools are instrumental in facilitating the event of those point-of-care diagnostic devices.

Micro Fabrication Techniques: Micro fabrication techniques were developed for applications within the semiconductor business and area unit, consequently, not specific for biological or medical applications. yet, each micro- and nanofabrication have offered variety of potentialities for the study of chemical, biological, and physical processes at the cellular and molecular scale, and for the planning of artificial devices capable of interacting with biological systems at these levels.

Some of the benefits of micro- and nanofabricated devices embrace the power to regulate the options to the micro millimeter scale for consistent production of structures and devices, the power to miniaturise already-existing systems for the study of cellular or molecular processes, the capability of as well as physical science among structural devices through the employment of the well-developed semiconductor techniques, and also the high outturn attainable with a number of the micro- and nanofabrication strategies.

The most necessary small fabrication techniques area unit lithography, soft lithography, film deposition, etching, and bonding. Lithography is employed to transfer a user-generated form onto a fabric through the selective exposure of a lightweight sensitive compound. Soft lithography encompasses 3 totally different techniques that area unit all supported the generation and utilization of the mould of a microstructure out of poly (dimethyl siloxane). Film deposition, as its name counsel, consists of the formation of micron-thick films on the surface of a substrate. Etching by selection removes materials from the surface of the small device by either chemical or physical processes. Finally, bonding adheres substrates in conjunction with or while not the employment of intermediator layers. The subsequent section can discuss these and different techniques in additional detail. Once lightweight illuminates a positive photoresist, the exposed regions break down and become a lot of soluble during a developing answer. As a result, the exposed photoresist is removed once in touch with the developing answer. A negative photoresist, on the opposite hand, becomes cross joined upon exposure to lightweight, so turning into insoluble within the developing answer. Consequently, upon contact with the developing answer, solely the elements not exposed to lightweight are going to be removed. Micro- and nanofabrication techniques have enabled the scientific and medical profession to expand the applications of already-existing devices through shrinking, and to form fully new devices with use of the accrued management of size, morphology, topology, and practicality offered by these techniques. These novel micro- and Nano devices are ready to contribute vastly to the fields of cell biology, molecular biotechnology, and medication. it's currently attainable to review the interactions of biomaterials with biological systems at the cellular and molecular scale, and to style new artificial systems that area unit ready to alter physiological responses by capitalizing on these findings. Applications of small and Nano devices within the medical and pharmaceutical field area unit the main focus of this section.

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