

Investigation of iontophoresis drug delivery effects on its kinetics and intracellular spaces in a controlled microfluidic device

김성봉, 이승기¹, 신용희, 최인희¹, 강태욱[†]
서강대; ¹서울시립대
(twkang@sogang.ac.kr[†])

Use of iontophoretic drug delivery system and mechanism have recently expanded its scope toward chemotherapy of cancers as its efficiency of drug delivery to target tissue or organelle while mitigating the chronic side effects of chemotherapy. The behavior of chemotherapeutic drugs in the microenvironment of intra- and extracellular matrix under iontophoresis is not fully explored yet. Here, we present the design of microfluidic iontophoresis device for investigation of iontophoretic drug delivery effects on the kinetics of chemotherapeutic drug mobility. The microfluidic device simply consists of a chamber (depth: 600 μm) that heparin-based hydrogel is incorporated for 4T1 cancer cell culture and pad type electrodes system in which Au and MoO_3 compound are deposited. Investigation of the various factors (potential, ratio of uptake and diffusion, and effects of concentration, mobility, charge, etc.) of iontophoresis observing the change of intracellular space and skeletal proteins before and after iontophoresis drug delivery, we conducted in this study, helps to understand and predict chemotherapeutic drugs mobilities under the effect of iontophoresis drug delivery.