

Abstract Submitted  
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**Bio-fluid Analysis in the Microfluidic Channels in the Organ-On-a-Chip Systems.** JAEHYUK LIM, RICHARD KYUNG, Choice Research Group — Organ-on-a-chip (OOC) systems are microfluidic 3D models of human tissue and organs. This system allows stimulation of various biological and physiological mechanisms of the human body. The organ-on-a-chip system has displayed a strong potential for use in personalized medicine and drug screening. Such a breakthrough can substitute traditional methods such as the conventional planar and static cell cultures, and therefore, reduce the use of animal models. The organ-on-a-chip replicates the function of the organ on a smaller scale, which not only reduces time and cost invested into experiments, but also produces better results. The organ-on-a-chip system is a valuable tool in further studying the functional properties, pathological states, and development of organs. This OOC system displays a laminar flow scheme. The laminar scheme has slow flow rate and higher fluid viscosity, resulting in a small Reynolds number. This paper assumes the laminar flow scheme from the small dimensions of the microfluidic cell culture chip. This study examines the flow of the microfluidic channels in the OOC systems, and the consequences of altering pressure and velocity in these channels.

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