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Prediction and validation of concentration gradient generation in a paper-based microfluidic channel[1] ILHOON JANG, GANG-JUNE KIM, SIMON SONG, Hanyang Univ — A paper-based microfluidic channel has obtained attention as a diagnosis device that can implement various chemical or biological reactions. With benefits of thin, flexible, and strong features of paper devices, for example, it is often utilized for cell culture where controlling oxygen, nutrients, metabolism, and signaling molecules gradient affects the growth and movement of the cells. Among various features of paper-based microfluidic devices, we focus on establishment of concentration gradient in a paper channel. The flow is subject to dispersion and capillary effects because a paper is a porous media. In this presentation, we describe facile, fast and accurate method of generating a concentration gradient by using flow mixing of different concentrations. Both theoretical prediction and experimental validation are discussed along with inter-diffusion characteristics of porous flows.

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