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關鍵字(中)	微電泳晶片、電化學偵測、神經傳導物質、聚合電解質、HPC、羥丙基纖維素、電場增益、擴散抑制
關鍵字(英)	Electrophoresis microchip, Electrochemical detection, Neurotransmitters, Polyelectrolytes, HPC, Hydroxypropyl cellulose, Electri
摘要(中)	微電泳晶片連接電化學偵測儀除了靈敏、快速、檢體及溶劑低消耗等優點外，微小化和批製也很容易。惟目前分離效率仍不及傳統毛細電泳，分離的速度也可再改善。本研究所發展的超級晶片系統(superchip)，負有兩大任務，即縮短樣品分離時間及提升訊號解析度；最終目的是希望能在數十秒內連續分離至少五個物種。本文所探討的參數乃因應這兩目標

	<p>所做的前導研究。據文獻報導，電泳入口若為沙漏形，會改變入口處的電阻值而獲得額外的電場強度，進而縮短分析時間。本實驗以神經傳導物質多巴胺與兒茶酚為樣品，以比較各型晶片的場增效應，及實驗過程的擴散效應。緩衝液中若摻入聚合電解質如羥丙基纖維素等，發現可以抑制溶質的擴散。最後發現以窄口雪莉酒杯型的入口設計，可以提高電場。而實驗過程中溶質擴散的問題，可以事先在流道中來回塗佈 8 ppm 的羥丙基纖維素(HPC)來克服。上述的電場增益及擴散抑制，可以同時提高速度及效率，以提供將來設計超級晶片時，所需的分離效率。</p>
<p>摘要 (英)</p>	<p>The advantages of sensitivity, speed, low consumption of sample and reagent, and the ease of integration--when annexing parts--with micro capillary electrophoresis are impressive. For one, it is surprisingly sensitive—at sub- or <math>\mu</math> M level—not too far below that by fluorescence but certainly superior to UV. However, its separation efficiency is inadequate for routine analysis, and besides its speed still has room for improvement. The name of superchip is coined to characterize a chip with high performances of speed, a few tens of seconds averaged for each sample, and separation efficiency with a peak capacity of five or more. This investigation serves the purpose of scouting the necessary traits for a superchip. The literature described the benefit of extra electric field strength by using an hourglass entrance for the separation channel, which, in turn, accelerated migration. This investigation probes into the effects of entrance-shape induced field enhancement and diffusion suppression from repeated coatings of HPC, a polyelectrolyte, with the injection of dopamine and catechol. The chip performance can be maximized by shaping the entrance as a sherry wine glass to harness the benefit of field enhancement and by precoatings of 8 ppm HPC to suppress the degree of suppression. The sought-after versatility, sensitivity and speed for a superchip may emerge as more research is in progress.</p>
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