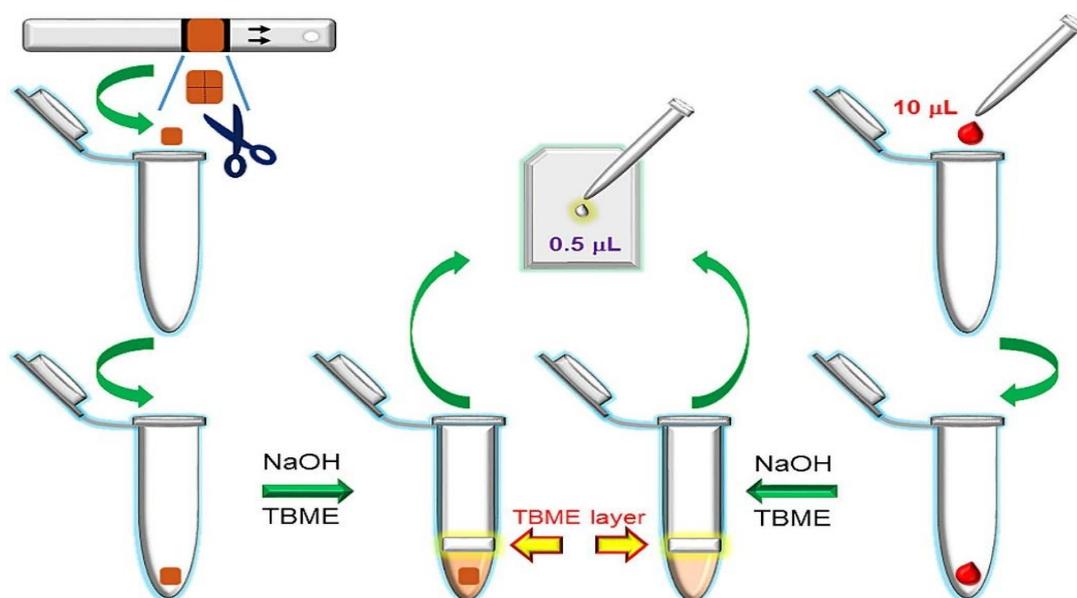




## 呂濟宇 教授

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二甲雙胍常用於治療第 2 型糖尿病，它在治療慢性疼痛、抗衰老和抗癌方面也展現出潛力，它還具有心血管保護和神經保護作用。然而，血漿中二甲雙胍濃度升高時可能導致二甲雙胍相關性乳酸性酸中毒。二甲雙胍也會導致維生素 B12 和葉酸缺乏，並對一碳代謝產生負面影響。本研究採用微萃取法從人類血漿和血糖試紙中萃取二甲雙胍，然後使用基質輔助雷射脫附游離飛行時間式質譜儀進行檢測。在最佳化的微萃取條件下，並使用環保型鹼及溶劑，此方法只需 10  $\mu\text{L}$  人血漿和一小塊血糖試紙即可進行二甲雙胍分析。血糖試紙為一次性產品，如能重複使用將可進一步提高其應用價值。為了減少臨床應用中的有機廢物，微萃取是一種簡單且高效的樣本製備方法，適用於極少量血液樣本。





**【具體成果】**

● 學術成就

Microchemical Journal, 2024, 205, 111343.

**【研究團隊】**

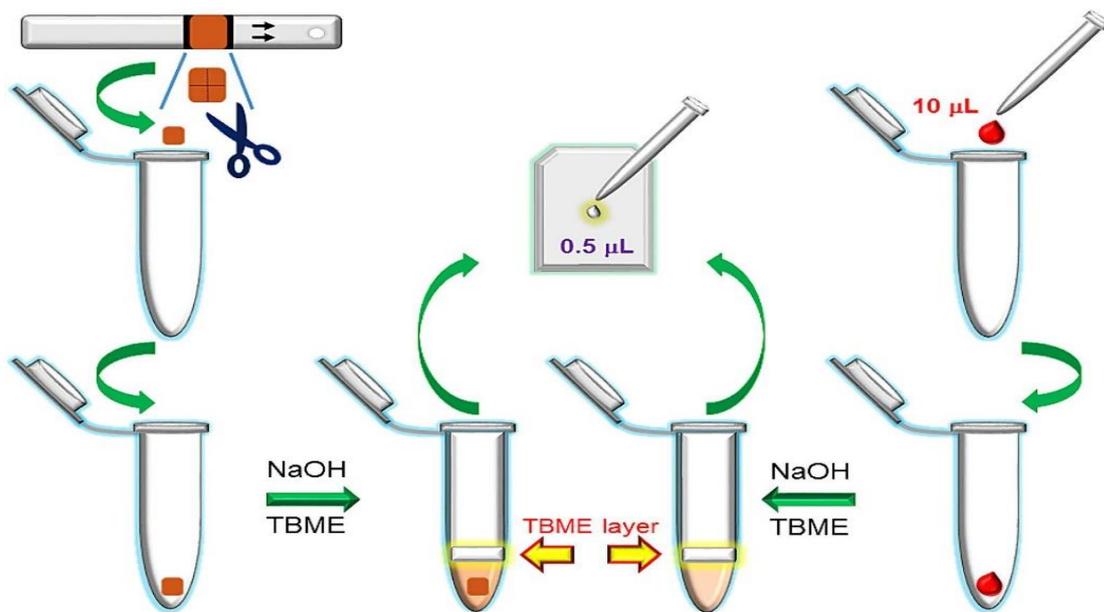
團隊成員：呂濟宇

團隊簡介：微量及超微量生物醫學檢測方法開發團隊

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Metformin is commonly used to treat type 2 diabetes and has shown potential in treating chronic pain, anti-aging, and anti-cancer effects. It also has cardiovascular and neuroprotective effects. However, elevated plasma metformin concentrations can lead to metformin-associated lactic acidosis. Metformin can also cause vitamin B12 and folic acid deficiencies and negatively impact one-carbon metabolism. This study used microextraction to extract metformin from human plasma and blood glucose test strips, followed by detection using matrix-assisted laser desorption/ionization time-of-flight mass spectrometry. Under optimized microextraction conditions and using environmentally friendly alkalis and solvents, this method requires only 10  $\mu\text{L}$  of human plasma and a small blood glucose test strip for metformin analysis. Blood glucose test strips are single-use products; reuse can further enhance their application value. To reduce organic waste in clinical applications, microextraction is a simple and efficient sample preparation method suitable for very small amounts of blood samples.





**【Concrete Results】**

● **Academic Achievements**

Microchemical Journal, 2024, 205, 111343.

**【Research Team】**

**Team Member:** Chi-Yu Lu

**Overview:** This laboratory is a team dedicated to developing methods for the detection of trace and ultra-trace biomedical substances.

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