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Application of solid-phase extraction tips for the analysis of drugs in human blood

Chika Hasegawa

Toho University School of Medicine, Japan

Solid-Phase Extraction (SPE) is a sample clean-up and pre-concentration technique that has been used widely to isolate target analytes from biological samples. Recent trends in SPE techniques focus on miniaturizing the process, reduction of sample and solvent consumption. In 2007, a new SPE device, the MonoTip C18 tip was jointly developed by our group and GL Sciences (Tokyo, Japan) for the extraction of drugs and poisons from human body fluids. In this device, octadecylsilane modified monolithic silica gel is directly attached to the inner surfaces of the pipette tips. The procedure for drug extraction with the SPE tip is essentially the same as that for the conventional SPE (conditioning, sample loading, washings, drying and elution) but differs in that all manipulations are carried out by aspirating and dispensing through a single pipette tip using a manual micropipettor. An advantage of using the SPE tips for sample preparation is that extraction is simpler and faster than with conventional SPE cartridges. Furthermore, the small bed volume and sorbent mass enables reduction of the sample and solvent volumes, cleaner extract and higher throughput. This unique SPE methodology is very useful in combination with gas chromatography/mass spectrometry (GC/MS) to provide high simplicity, recovery, reproducibility and sensitivity. Some successful data obtained by the SPE tips and GC/MS are presented for analyses of basic and acidic drugs in human blood samples.

Biography

Chika Hasegawa is an Assistant Professor of Department of Legal Medicine, Toho University School of Medicine. She has both PhD in Medicine and LLM degree. Her current research interests include forensic toxicology, development of drug analysis and medical ethics. She has published more than 40 research papers in international peer reviewed journals and attended various international conferences and seminars. She is a Councilor Member of Japanese Society of Legal Medicine and Japanese Society for Biomedical Mass Spectrometry. She is also a Member of Japanese Association of Forensic Toxicology and Japanese Association of Criminology.

chika99@med.toho-u.ac.jp

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