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Single lysis-salting out method of genomic DNA extraction from dried bloodspots

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Dried blood spots (DBS) are important form of bio-sampling, where DNA can be stored and used for genetic studies. This has necessitated to develop an efficient and economical genomic DNA (gDNA) extraction protocol from these sampling cards. We have developed a novel and non-hazardous method called "single lysis-salting out (SLSO) protocol to extract gDNA from DBS samples. The efficiency of this protocol was evaluated against the commercial kits (Qiagen and Analytica Jena). For the purpose of this study, whole blood DBS samples were collected from 10 clinically healthy volunteers and 30 confirmed Glutaric Aciduria Type I (GA-I) patients from India. The gDNA was extracted from the collected DBS samples by SLSO, QIAamp® gDNA Micro kit and innuPREP forensic kit methods. The yield and quality of gDNA obtained was determined by measuring the absorbance using Nanodrop spectrophotometer. It was observed that SLSO method showed four-fold and eight-fold increased yield of gDNA in healthy volunteers and patient samples respectively compared to commercial kits ($p < 0.0001$). The purity of gDNA was concordant with the commercial kits ($r^2 \geq 0.9$). This method was found to be cost effective, reducing the per sample cost to nearly half. The suitability of SLSO method for genetic studies was confirmed by performing R402W genotyping by RFLP in GA-I patients from India. The genotyping results showed the presence of R402W mutation in 20% (6/30) of patients. In conclusion, the SLSO protocol was found to be dependable, inexpensive, non-hazardous and appropriate for genetic studies.

Biography

Kruthika Vinod T P completed her PhD Neurochemistry in 2008 from NIMHANS, Bengaluru, India, a premier institute for Neurosciences in India. In 2009, she joined as Senior Scientific Officer in Department of Neurochemistry and was given the responsibility of screening metabolic disorders. Her research interest includes cerebral venous thrombosis, metabolic disorders and prenatal screening of metabolic disorders. She has 12 international publications in peer-reviewed journals. She has received young physicians/scientists awards in Neurology conferences and many travel fellowships. Recently, her student received "Chen's student award" for outstanding research for her work on GA-I at 11th APCHG, Hanoi, Vietnam 2015.

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