Spoton
Clinical Diagnostics

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(Founder Directors: R Neil Dalton and Charles Turner)

Over **5 million** babies tested for sickle cell disease
using **Spoton** CE/UKCA marked technology

Over **300,000** babies simultaneously tested for biotinidase deficiency,
type 1 tyrosinaemia (PBG synthase) and sickle cell disease
using **Spoton** CE/UKCA marked technology



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Assay Procedure

Punch a 3mm blood spot into deep well plate

↓

Add 50µl Biotinidase/PBG synthase reagent (Substrate reagent)

↓

Cover the plate and incubate at 37°C for 60 min with gentle shaking

↓

Remove cover and add 50µl Hb Reagent 1 (Internal standard reagent)

↓

Add 50µl Hb Reagent 2 (Trypsin reagent) and re-cover

↓

Incubate the plate at 37°C for 30-45 min with gentle shaking

↓

Remove cover & add 1 mL of stop reagent to each well

↓

Place the re-sealed plate into the autosampler for MSMS analysis

↓

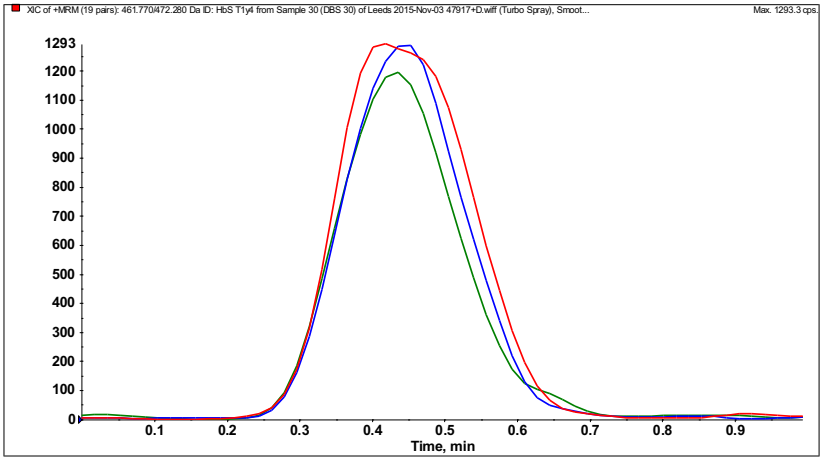
22 MRM transitions for S, C, Dpunjab, E, Oarab, F and WT beta peptides, porphobilinogen, biotin and substrates: acquisition time <1minute

↓

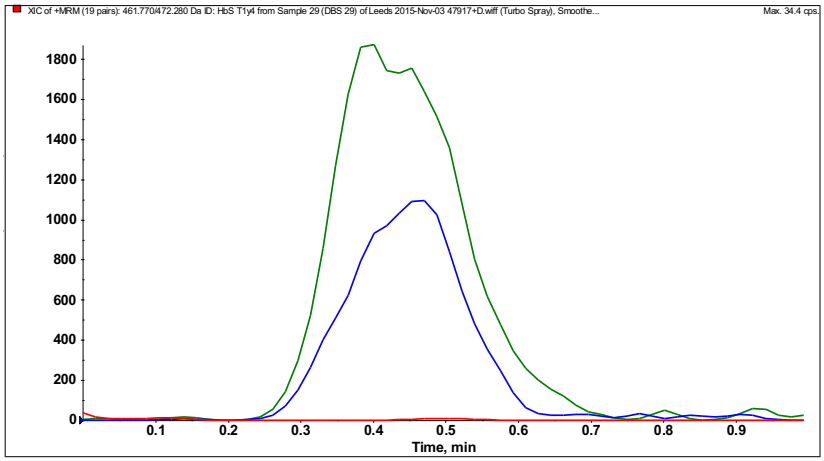
Automated data handling using neonatal screening software

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Flow Injection Profiles



S Heterozygote HbS peptide, Wild Type peptide, Internal standard



Unaffected neonate HbS peptide, Wild Type peptide, Internal standard

References and supporting publications

1. Daniel YA, Turner C, Haynes RM, Hunt BJ, Dalton RN. (2005). Rapid and Specific Detection of Clinically Significant Haemoglobinopathies Using Electrospray Mass Spectrometry-Mass Spectrometry. British Journal of Haematology. 130, 635-643

2. Daniel YA, Turner C, Farrar L, Dalton RN (2008). A comparison of IEF and MSMS for clinical hemoglobinopathy screening in 40,000 newborns. Blood 112: 2387 [ASH Annual Meeting Abstracts]

3. Moat SJ, Rees D, King L, Ifederu A, Harvey K, Hall K, Lloyd G, Morrell C, Hillier S (2014). Newborn Blood Spot Screening for Sickle Cell Disease by Using Tandem Mass Spectrometry: Implementation of a Protocol to Identify Only the Disease States of Sickle Cell Disease. Clinical Chemistry 60, 373-380

4. Daniel YA, Henthorn J (2016). Newborn screening for sickling and other haemoglobin disorders using tandem mass spectrometry: A pilot study of methodology in laboratories in England. Journal of Medical Screening 23, 175-178

5. https://www.gov.uk/government/publications/sct-screening-handbook-for-newborn-laboratories

6. https://www.gov.uk/government/publications/sct-screening-handbook-for-newborn-laboratories/action-values-for-tandem-mass-spectrometry-screening

7. Moat SJ, Rees D, George RS, King L, Dodd A, Ifederu A, Ramgoolam T, Hillier S (2017). Newborn screening for sickle cell disorders using tandem mass spectrometry: three years' experience of using a protocol to detect only the disease states. Annals of Clinical Biochemistry 55, 601-611

8. Klein J, Brose A, Frömmel C, Lobitz S, Blankenstein O, Turner C, Dalton RN (2018). Combined Tandem Mass Spectrometry (TMS) Screening Method for Biotinidase Deficiency, and Sickle Cell Disease (SCD) (abstract) International Journal of Neonatal Screening. 4(2), 17; https://doi.org/10.3390/ijns4020017

9. Lobitz S, Klein J, Brose A, Blankenstein O, Frömmel C. (2018). Newborn screening by tandem mass spectrometry confirms the high prevalence of sickle cell disease among German newborns. Annals of Hematology **98**, 47-53

10. Lobitz S, Frömmel C, Brose A, Blankenstein O, Turner C, Dalton RN, Daniel Y, Klein J (2022). Simultaneous newborn screening for sickle cell disease, biotinidase deficiency, and hereditary tyrosinemia type 1 with an optimized tandem mass spectrometry protocol. Annals of Hematology **101**, 1859–1860

11. Klein J, Blankenstein O, Frömmel C, Lobitz S, Turner C, Dalton RN, Daniel Y. (2025) Newborn screening for sickle cell disease Enzymatic and tryptic digestion combined with MS/MS detection https://analyticalscience.wiley.com/content/article-do/newborn-screening-sickle-cell-disease