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SCREENING FOR BLOOD DONORS WITH RARE PHENOTYPES BY MULTIPLEX PCR WITHOUT DNA PURIFICATION

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Background: DNA typing may be an alternative to screen for donors with rare blood groups, because the need for rare sera is obviated and all reactions may be multiplexed into a single reaction. We reasoned that elimination of the DNA purification step might lead to a simple method that may be useful in a routine setting.

Methods: A multiplex-PCR-SSP for the prediction of the Co(a), Lu(b), Yt(a) and Kp(b) was established using the Extract-N-Amp kit (Sigma-Aldrich). The PCR was performed directly from a crude blood lysate, obviating any DNA purification step. PCR was performed in a volume of 5 µl PCR products were visualized using a 3% agarose gel with ethidium bromide.

Results: Among 2743 donors, we detected 9 Yt(a-), 5 Lu(b-) donors and 4 Co(a-) donors. DNA isolation and PCR setup for 91 samples could be done in about 1 hour. The repeat testing rate was 15%. The hands-on time for 91 donors was 49 min retrieving O ccddee K neg samples, 55 min DNA isolation and PCR set-up, 48 min post-PCR processing.

Conclusion: Multiplex-PCR-SSP to predict rare phenotypes is feasible without DNA purification. This very simple procedure may be used for manual rapid donor screening.