

Pengembangan perangkat deteksi aglutinasi secara otomatis untuk uji golongan darah tipe ABO berbasis kertas whatman nomor 4 =  
Development of automatic agglutination detection device for ABO blood group typing based on whatman paper number 4

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Abstrak

Riset ini merupakan pengembangan berupa pengintegrasian perangkat alat uji golongan darah tipe ABO dan Rhesus berbasis kertas menggunakan metode kromatografi dan forward grouping dengan perangkat deteksi aglutinasi secara otomatis. Kertas uji dibuat dari kertas saring Whatman nomor 4 dengan tiga kolom hidrofilik dan diletakkan pada casing berbahan Polylactic Acid hasil cetak 3D. Masing-masing kolom hidrofilik diimobilisasi reagen anti-A, anti-B, dan Anti-D (resus) 3 l dengan 2 kali iterasi, dan 40 l jumlah sampel darah yang dibutuhkan dalam pengujian. Perangkat deteksi aglutinasi otomatis mengimplementasikan pengolahan citra metode Absolute Substract Difference (ASD) menggunakan Raspberry Pi dan PiCamera modifikasi. Tingkat akurasi perangkat 92,5% dan waktu proses selama 4 menit, waktu proses tersebut lebih singkat dari metode point of care test golongan darah lainnya.

.....This research is a development of integration for ABO and Rhesus blood group typing devices based on paper using chromatography and forward grouping method with automatic agglutination detection device. Paper test was made by Whatman No. 4 filter paper with three hydrophilic columns, and it were placed on a Polylactic Acid cases that was printed by a 3D printer. Each hydrophilic column was immobilized 3 L of anti-A, anti-B, and Anti-D (resus) reagents with 2 fold iteration, and 40 l of blood samples required in the test. Automatic agglutination detection device implements Absolute Substract Difference (ASD) method as a image processing using Raspberry Pi and PiCamera modification. The accuracy is 92.5% and 4 minute processing time, the processing time is shorter than the other point-of-care test blood typing methods.