# Development of a magnetic lab-on-a-chip for point-of-care sepsis diagnosis

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Abstract: We present design criteria, operation principles and experimental examples of magnetic marker manipulation for our magnetic lab-on-a-chip prototype. It incorporates both magnetic sample preparation and detection by embedded GMR-type magnetoresistive sensors and is optimized for the automated point-of-care detection of four different sepsis-indicative cytokines directly from about 5 μl of whole blood. The sample volume, magnetic particle size and cytokine concentration determine the microfluidic volume, sensor size and dimensioning of the magnetic gradient field generators. By optimizing these parameters to the specific diagnostic task, best performance is expected with respect to sensitivity, analysis time and reproducibility. 

Author Keywords: Biochip; Biosensor; Lab-on-a-chip; Magnetic; Magnetoresistance; Microfluidic; Point-of-care

Year: 2009
Source title: Journal of Magnetism and Magnetic Materials
Volume: 321
Issue: 10
Page : 1671-1675
Cited by: 3
Link: Scorpus Link
Document Type: Article
Source: Scopus

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