

2015.06.04

GMR based biosensor

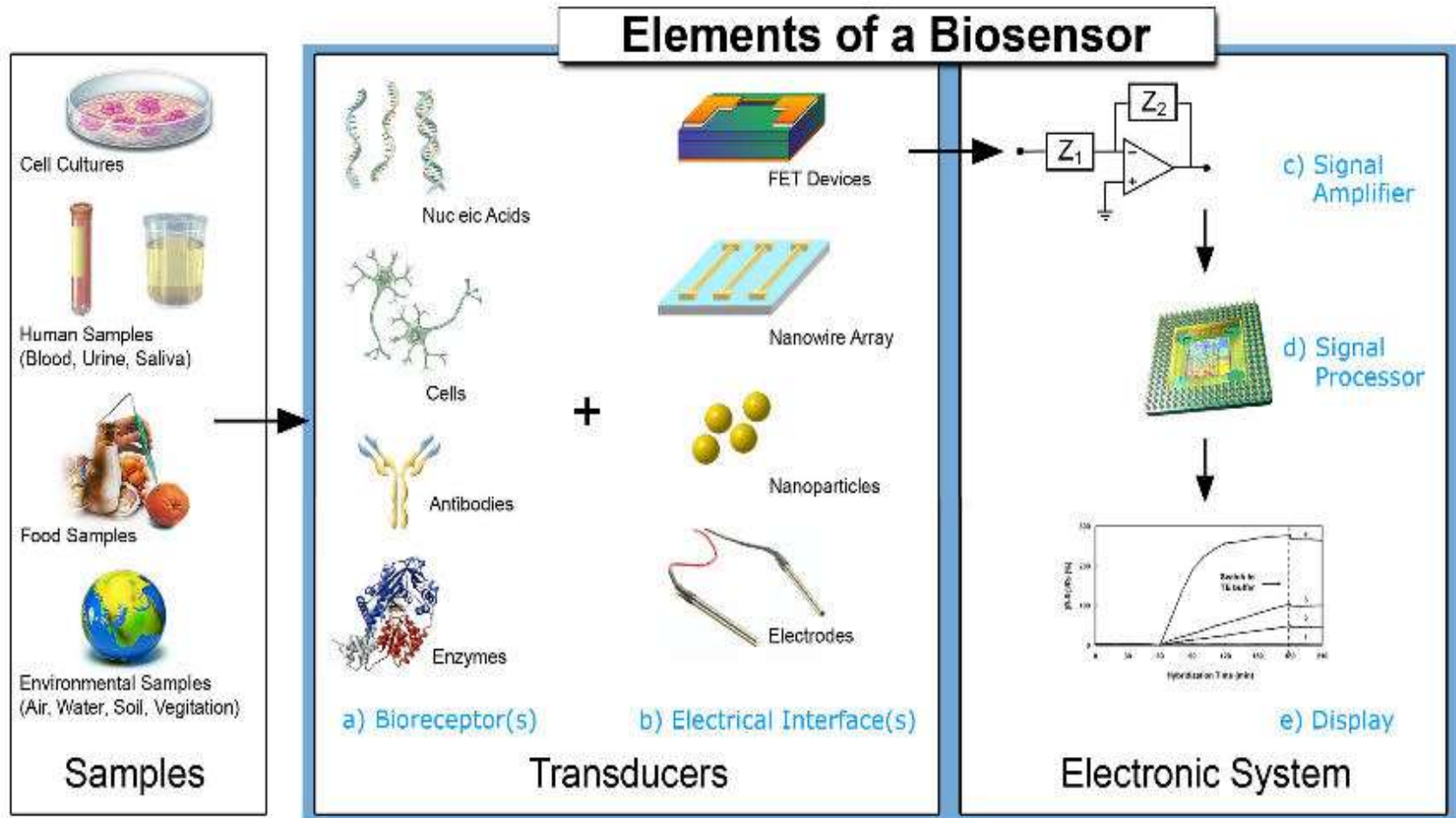
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Contents

1. Introduction
2. History
3. Principle
4. Application
5. Conclusions

Introduction

What is biosensor?



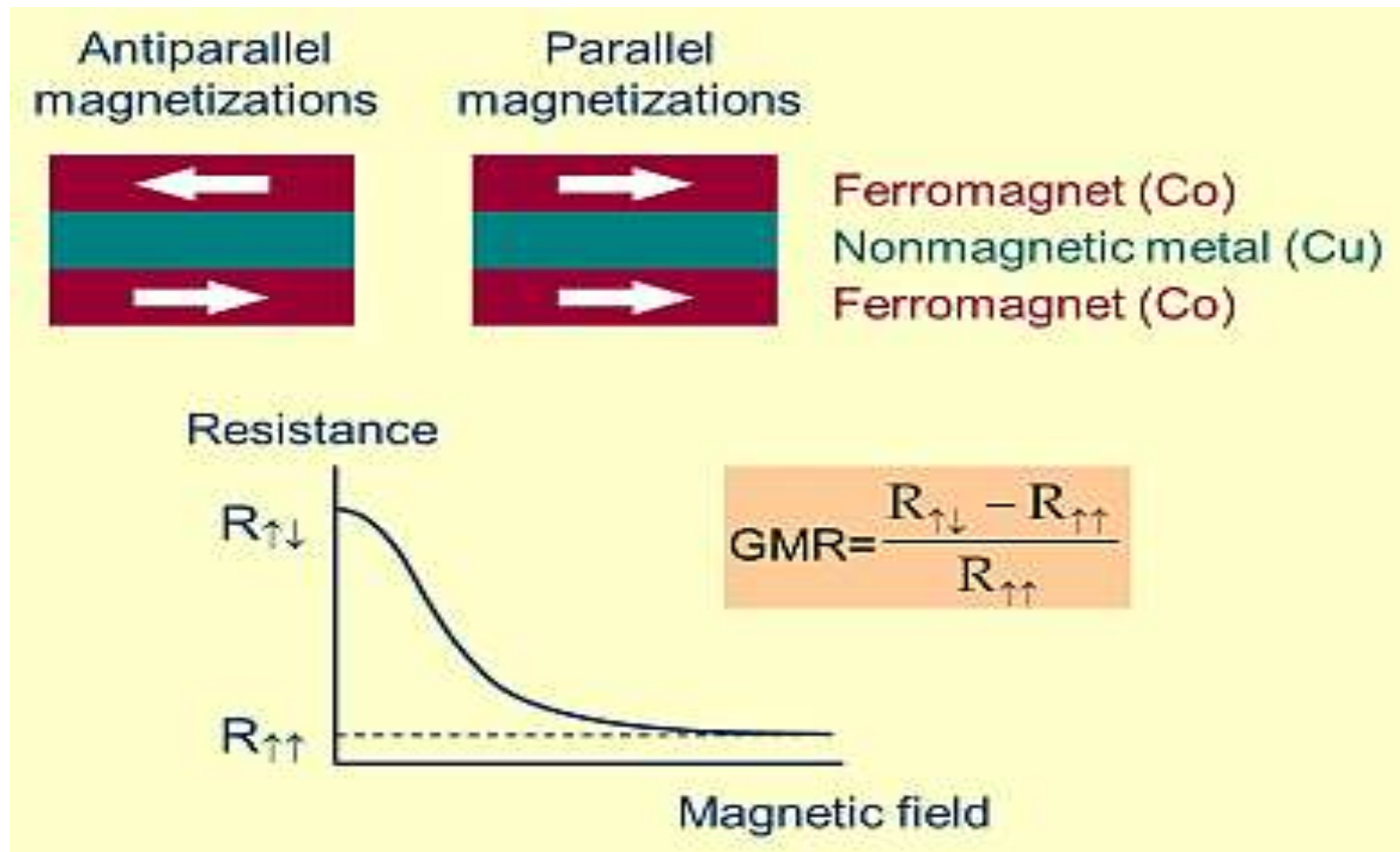
Introduction

Types of biosensor

- Electrochemical biosensors
- Optical biosensors
- Electronic biosensors
- Piezoelectric biosensors
- Gravimetric biosensors
- Pyroelectric biosensors

Introduction

GMR effect (1988)



History of GMR based biosensor

★ 1990

-Magnetoelctroincs biosensor and biochip development

★ 1998

- DNA DECTION

★ 2003

-NRL first demonstrated magnetic biosensor

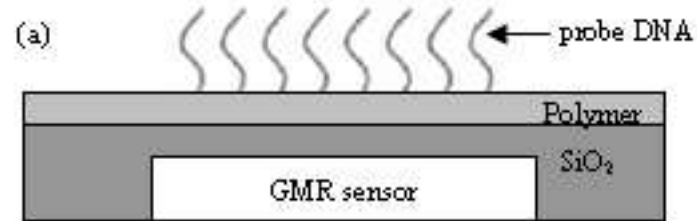
★ 2004

-GMR multilayer biodetection was superior to fluorescent biodetection

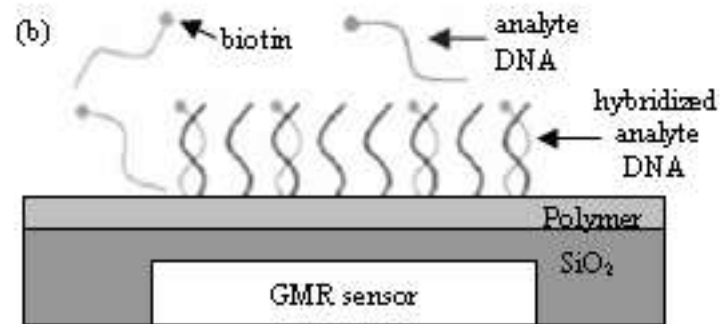
★ 2015

-GMR based biosensing probe station system for multiplex protein assays

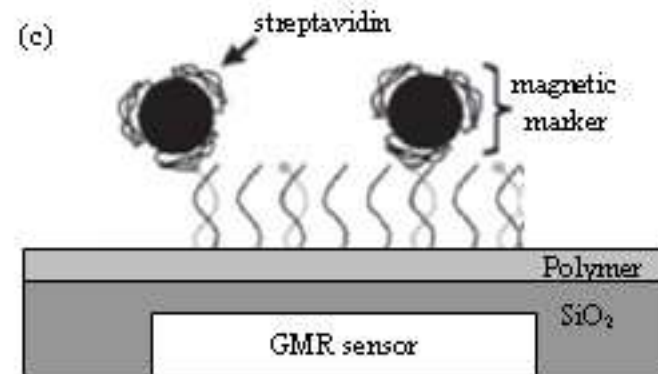
Principle of GMR biosensor



(a) Immobilization

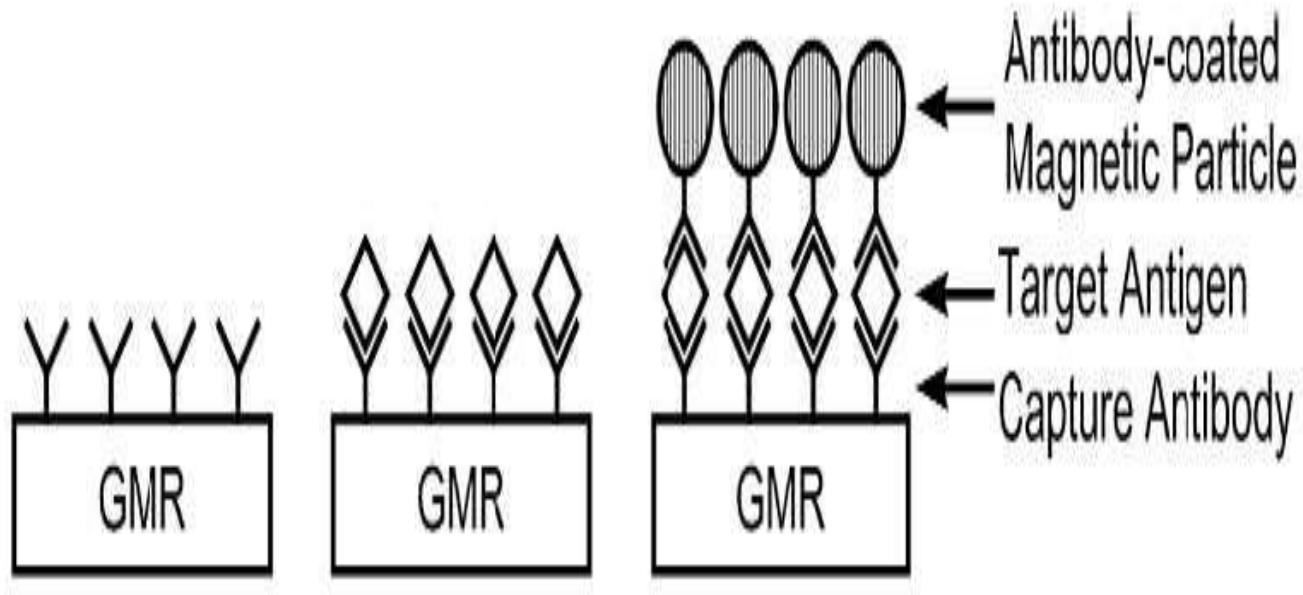


(b) Hybridization



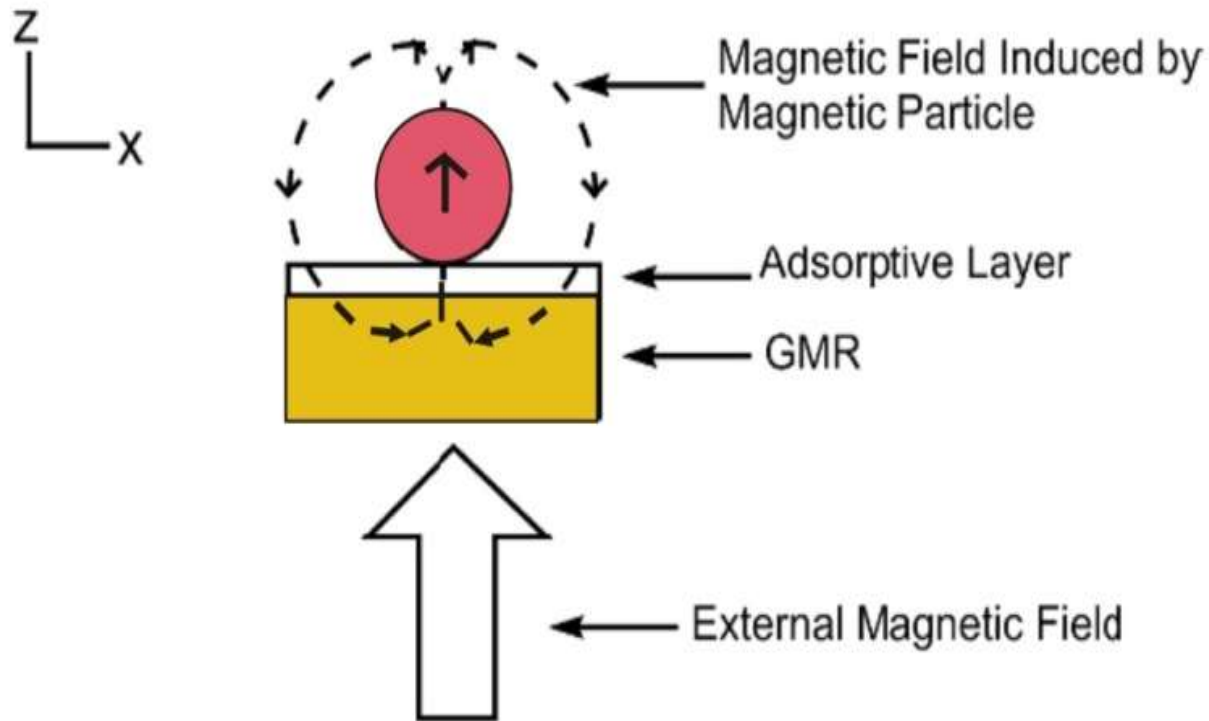
(c) Introducing & binding

Application



Bacteria sensing using a GMR biosensor

Application



Detection of magnetic particle on GMR biosensor

Conclusions

The GMR biosensor are best candidates for future device based on lab-on a-chip, compact and inexpensive detection units in clinical diagnostic. Compared to complex and expensive optical detection systems, the GMR biosensor measures electrical signal directly from the sensor, and makes a low-cost, highly portable device feasible. On other hand, GMR biosensors are more sensitive, portable and give a fully electronic readout.

Reference

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Thanks for listening