

Accepted Manuscript

Title: Bimetallic Au-Ag Alloy Nanoislands for Highly Sensitive Localized Surface Plasmon Resonance Biosensing

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PII: S0925-4005(18)30556-2
DOI: <https://doi.org/10.1016/j.snb.2018.03.066>
Reference: SNB 24351

To appear in: *Sensors and Actuators B*

Received date: 16-11-2017
Revised date: 5-3-2018
Accepted date: 13-3-2018



Please cite this article as: Guangyu Qiu, Siu Pang Ng, Chi-Man Lawrence Wu, Bimetallic Au-Ag Alloy Nanoislands for Highly Sensitive Localized Surface Plasmon Resonance Biosensing, Sensors and Actuators B: Chemical <https://doi.org/10.1016/j.snb.2018.03.066>

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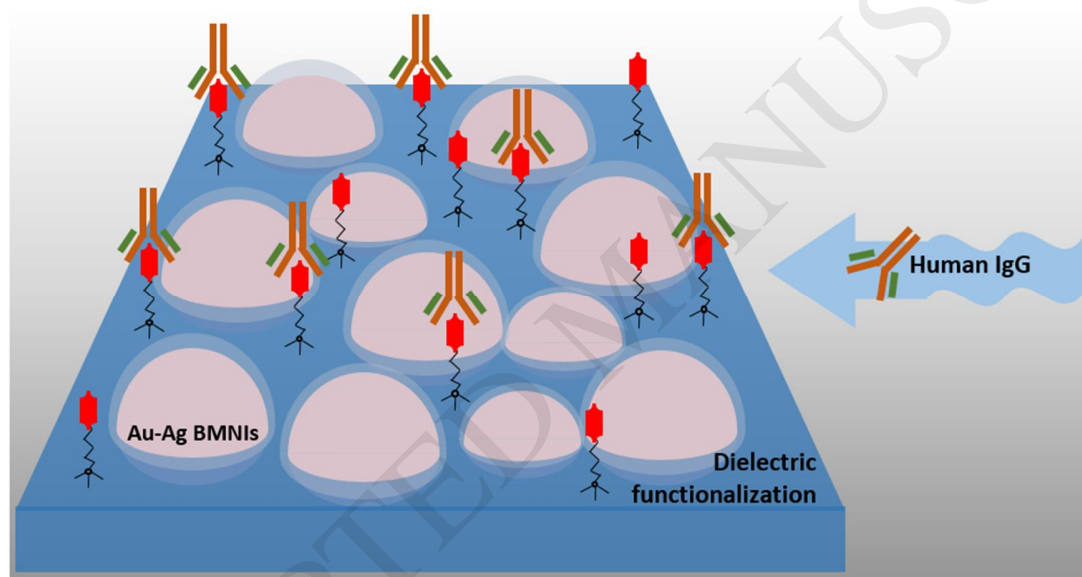
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Graphical Abstract



Highlights:

- Large area solid-state synthesis of Au-Ag bimetallic nanoislands for highly sensitive localized surface plasmon resonance sensing;
- Tunable LSPR by changing the nanoislands size and atomic ratio of Au-Ag bimetallic nanoislands;
- Optimized dielectric functionalization of Au-Ag bimetallic nanoislands for biosensing applications;
- Dielectric functionalized Au-Ag bimetallic nanoislands LSPR sensors showing desirable biosensing performance;
- Robust LSPR sensing medium: high chemical and structural stability.

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