

## Abstract

# Gold Nanoclusters Investigated via Femtosecond-Stimulated Raman Spectroscopy <sup>†</sup>

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**Abstract:** Gold nanoclusters (AuNCs), with diameters less than 2 nanometers, have particular fluorescent properties. These nanoclusters can be prepared by microwave-assisted synthesis using BSA (bovine serum albumin) as a template [1]. During the synthesis, Au(III) ions are reduced to Au(I) or Au(0), which are bonded to BSA, forming, thus, Au(I)-BSA complexes and/or AuNCs-BSA, respectively. Here, femtosecond-stimulated Raman spectroscopy (FSRS), an ultrafast nonlinear optical technique, is used to study the vibrational structure of Au(I)-BSA complexes and AuNCs-BSA. FSRS has time resolution comparable to the vibrational period of molecular movements (ps to fs) and energy resolution less than 10 cm<sup>−1</sup>. Three laser pulses are exploited in a typical FSRS experiment: actinic pulse, Raman pulse and probe pulse [2]. According to our preliminary results, FSRS represents a very promising tool in the investigation of Au(I)-BSA complexes and AuNCs-BSA systems.

**Keywords:** gold nanoclusters; BSA; fluorescence; femtosecond-stimulated Raman spectroscopy



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**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/materproc2022009023/s1>. Reference [3] are cited in the supplementary materials.

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