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## Optimized Surface-enhanced Raman Scattering (SERS) Colloids for the Characterization of Microorganisms

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We report on a comparison of silver colloid preparation methods for the *in situ* analysis of microorganisms based on surface-enhanced Raman scattering (SERS). Different colloid sols were tested and optimized regarding their suitability as SERS substrates. The silver sols produced by a modified procedure of Leopold and Lendl gave an enhancement factor of the Raman signal in the order  $10^8$  for the test molecule, crystal violet. Furthermore, this SERS substrate was successfully applied for the *in situ* detection and identification of microorganisms immobilized on an immunoassay. The colloid preparation was carried out at room temperature and the colloids were stable for weeks. This silver nanoparticle preparation method for the label-free *in situ* detection of microorganisms successfully combines SERS with immunoassays. Hence, it has a great potential for the high-throughput detection of biomolecules.

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