

# Peptide-Conjugated Silver Nanoparticles for the Colorimetric Detection of the Oncoprotein Mdm2 in Human Serum



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Invited for this month's cover are the collaborating groups of Prof. Gilles Bruylants and Prof. Ivan Jabin, Université libre de Bruxelles, Belgium. The cover picture shows the principle of a colorimetric sensor, based on peptide-conjugated silver nanoparticles, for the detection of the cancer biomarker Mdm2. The particles were functionalized via a recently developed strategy based on the use of calixarene diazonium salts. The calixarene-based coating provides an unprecedented stability to the silver nanoparticles, enabling their use as colorimetric reporters for in vitro diagnostics. The cover was designed by I. Jabin. More information can be found in the Research Article by I. Jabin, G. Bruylants, and co-workers.

## What is the most significant result of this study?

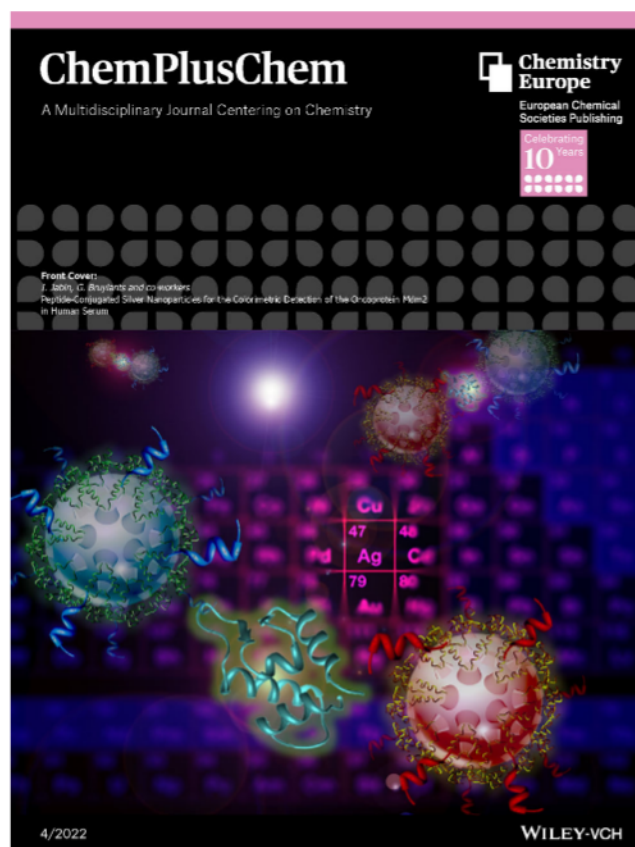
We were very enthusiastic when we discovered how stable the silver nanoparticles were when protected with our calixarene-based coating. From that, we had to demonstrate that they could be used as colorimetric reporters under real diagnostic conditions. We were surprised to see how these nanoparticles outperform the gold nanoparticles that we had used previously for the development of a similar sensor. Not only was the limit of detection one order of magnitude lower, but we could work in human plasma, bringing the sensor much closer to applicability.

## How did the collaboration on this project start?

The collaboration started in 2016. Gilles Bruylants (EMNS, ULB) was developing sensors based on gold nanoparticles functionalized via a classical thiol chemistry and was facing the same problems as most researchers working with these particles: lack of stability, impossibility to correctly control the composition of the organic layer. Ivan Jabin (LCO, ULB) and French collaborators had just developed a surface functionalization strategy based on calixarene-tetradiazonium salts. They had used it on several surfaces, showing great promise and the idea came up to apply this coating to gold nanoparticles. We were lucky to be able to count on several brilliant researchers to develop this technology, as the set up was not straightforward. The results exceeded our expectations, and the strategy has now been extended to different nanomaterials, always with outstanding outcomes.

## Acknowledgements

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## COVER PROFILE

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**“Silver nanoparticles (AgNPs) coated with PEGylated calixarenes and conjugated to peptide aptamers were used for the colorimetric detection of Mdm2 in human serum via a dual-trapping strategy.” (DOI: 10.1002/cplu.202100450).**