

**Report on the habilitation thesis entitled “ROLE OF SURFACE
ENHANCED RAMAN SPECTROSCOPY IN THE ANALYSIS OF
BIOMARKERS” presented by**

Dr. Václav Ranc

The habilitation thesis presented by Dr. Václav Ranc is related to Raman spectroscopy applications in very interesting research areas and development carried out by the candidate during the last 10 years. The candidate has carried out research in the field of application of Raman spectroscopy for biomolecules analysis. The analytes, he has been focused, have been various ranging from proteins, nucleic acids and cells. The various publications of the author demonstrate that the application potential of Raman spectroscopy, surface enhanced Raman spectroscopy, and magnetically assisted surface enhanced Raman spectroscopy to analyse various physiologically active compounds are really high. The obtained results, as shown in various publications, demonstrate the high quality of the research carried out by the candidate and his collaborators.

The candidate has demonstrated in this thesis that he has great knowledge on fundamental aspects of Raman effect as well as SERS. The applications shown in this thesis include development of various interesting methodologies through the use of nanomaterials for the detection of various analytes. Between various applications of great interest is the application of silver nanoparticles in SERS followed by the use in discrimination of bacteria. The authors also demonstrated the utility of magnetically

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assisted surface enhanced Raman spectroscopy for the analysis of several analytes such as dopamine, human IgG, cancer biomarkers as well as localization of growth factors on human dentin. In the various applications, the candidate has demonstrated advantages of SERS in the improvement of analytical performance parameters. Such results have been of interest for the analytical chemistry community which is shown also by high impact publications (Anal. Chem. etc.).

The thesis is well written and show an excellent research trajectory of the candidate demonstrating his authority in the field.

Given the quality of the obtained results and the various publications at high impact journals in the field, I express my highest consideration/evaluation for the work done so far by the candidate. Dr. Ranc has shown a great capability as scientist therefore I strongly support his application for habilitation through the work summarized in this thesis.

Sincerely,

Arben Merkoçi

Bellaterra (Barcelona) Novembre 11th, 2019

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