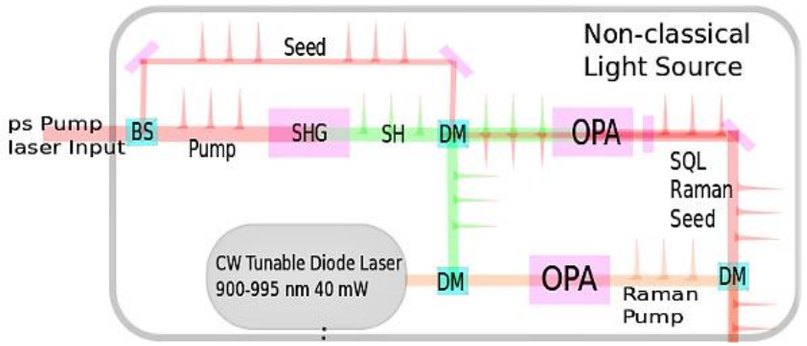
QUANTERA
ERA-NET Cofund in Quantum Technologies

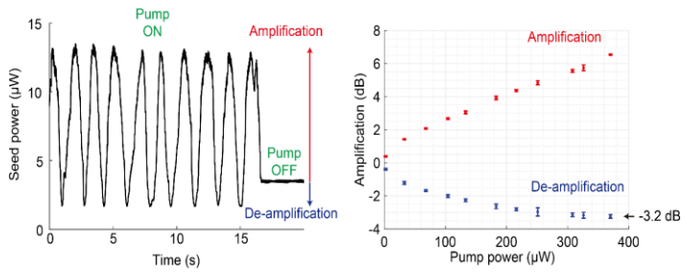
# QuRAMAN

## *Quantum enhanced Raman spectroscopy for bioimaging applications*

*The accuracy of classical optical detection is fundamentally restricted by the shot noise. We exploit non-classical light to circumvent the classical limits in spectroscopic fingerprinting thus opening novel avenues for high-accuracy medical diagnostics. Raman spectroscopy – on the single cellular level – is one of the analytical tools that are being intensively investigated for biomarker identification that correlate to disease status and progression. Unfortunately, the Raman signal achieved from small biological samples is extremely weak, which necessitates the use of high optical powers in order to obtain satisfactory signal-to-noise (SNR) levels.*

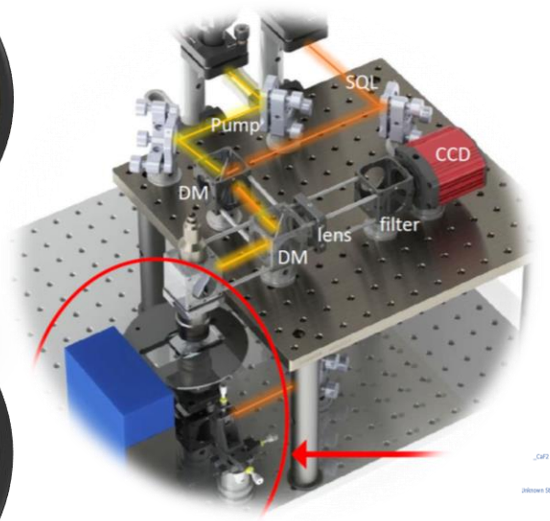
During this project, the following main features will be developed and evaluated:
1. Development of the quantum Raman microscope.
2. Application to human tissue to support fast, objective, and reliable histopathological lung cancer screening.
3. OEM light source and compact microscope will be provided as plug&play modules, for supporting bioimaging and quantum technologies in education, science, and industry.



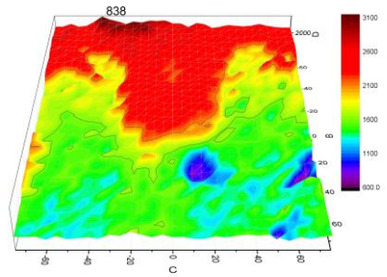

Classical gain curves for the traveling wave OPA.



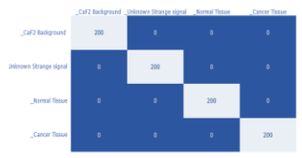


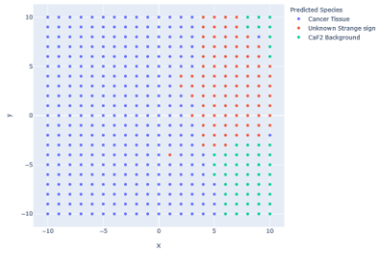

Quantum SRS microscope

(classical) RS mapping of tissue sample.




ML for identification



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https://www.quraman.eu/

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Delfi Group
NICPB KBFI
MPL Max Planck Institute for the science of light