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Multiplex CARS microspectroscopy: advances in instrumentation, data analysis and applications

Multiplex coherent anti-Stokes Raman scattering (MCARS) microspectroscopy based on sub-nanosecond supercontinuum excitation [1,2] has become a reliable technology for label-free bioimaging. Owing to recent developments in fiber-based laser systems, the associated instrumentation could be significantly simplified and compactified. In addition, new numerical methods have been introduced to perform the unsupervised analysis of MCARS hyperspectral data, based on multivariate [3] or deep-learning [4] approaches. These advances pave the way for the development of a complete chain of acquisition, processing and analysis of MCARS data (Fig. 1), which should foster applications of coherent Raman technology on a wider scale.

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References

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Figures

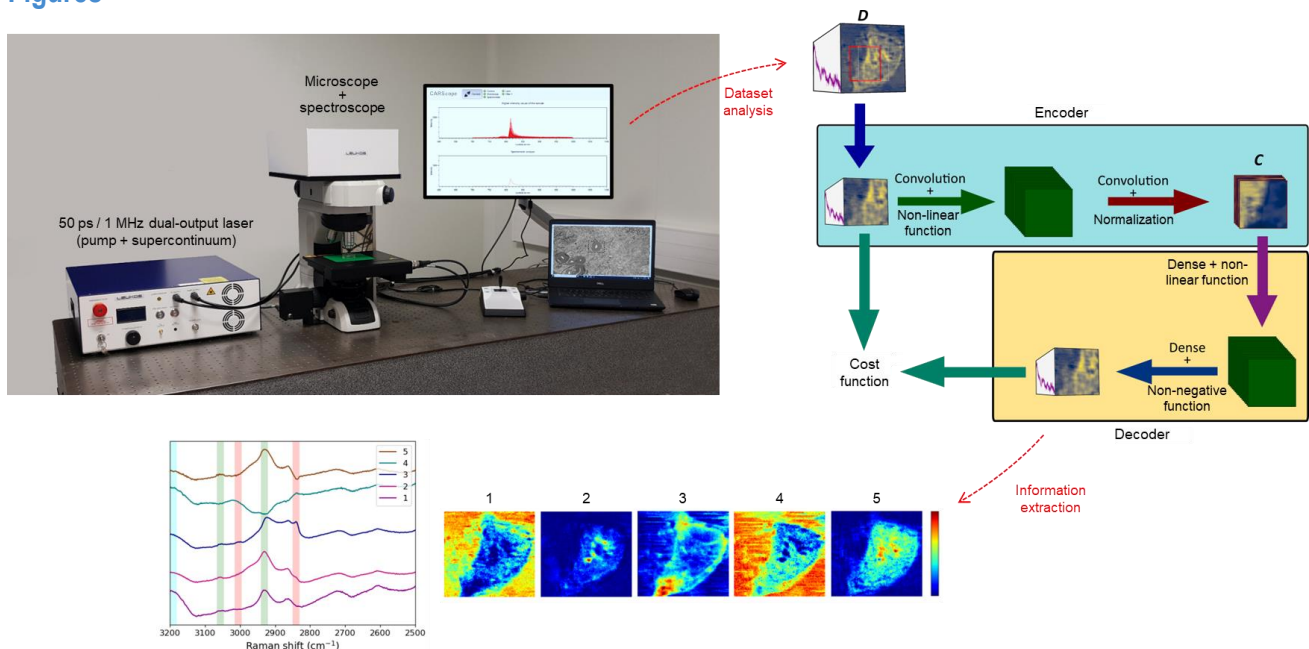


Figure 1: Development of a complete chain of acquisition, processing and analysis of MCARS hyperspectral data for biomedical applications.