This thesis describes the application of cavity ring-down spectroscopy (CRDS) to various analytical flow systems. CRDS is a very sensitive absorbance detection method that is well-established in the gas-phase. Currently, liquid-phase CRDS is a rapidly developing field since absorbance detection is the generic detection method in analytical chemistry. Absorbance spectroscopy is not a zero-background technique and therefore inherently less sensitive than e.g. fluorescence detection. The advantages of absorbance detection include the simplicity and universality of the method, and the development of sensitive absorbance detection methods remains a relevant task.

The research described in this thesis can be divided in two parts: liquid-phase CRDS and evanescent-wave CRDS. Different solutions for applying liquid-phase CRDS to liquid chromatography detection are described. Evanescent-wave CRDS combines the sensitivity of CRDS with the surface-specificity of evanescent-wave spectroscopies. The application of evanescent-wave CRDS in analytical chemistry is being explored demonstrating the feasibility of e.g. label-free biosensing based on EW-CRDS.