

## Abstract

The main purpose of this PhD study was (i) to develop a method for isolation of resveratrol conjugates from human urine, (ii) to develop a suitable and sensitive method for quantification of resveratrol and resveratrol metabolites in urine, plasma and tissues in connection with preclinical and clinical trials, (iii) to explore the application of resveratrol in treatment of some inflammatory-related diseases, such as type-2 diabetes and obesity, and (iv) to search for plant extracts with anti-inflammatory activity as a source for the isolation of potential anti-inflammatory compounds with an activity profile similar to resveratrol.

In chapter 1, the nature mechanisms that stay behind inflammation are described in brief. This facilitates in understanding the problem of inflammatory-related diseases and gives some hints on how they could be controlled and treated.

The anti-inflammatory properties of resveratrol are described in Chapter 2, as well as its bioavailability and metabolism *in vivo*. In this chapter, one can also find some guidelines on isolation of resveratrol metabolites from human urine, whereas the full description of the method is given in Publication 1.

In this project, detection and quantification of resveratrol metabolites in biological samples were performed on a “Linear Trap Quadrupole” mass spectrometer (LTQ XL) from Thermo Fisher Scientific. In chapter 3, it is described how the method of detection could be validated and optimized in order to perform accurate measurements of resveratrol and its metabolites in urine, plasma and tissues. Results obtained in this study can be found in Publications II and III.

Chapter 4 illustrates how some selected extracts have been screened for their anti-inflammatory activity that relies on their effect on interleukin-6 (IL-6). Bioassay-guided fractionation approach for search of new bioactive compounds with anti-inflammatory activity is also described. Publication IV contains some of the results of this work.