Introduction

For more than 5,000 years, humans have used substances or methods with the purpose of enhancing exercise performance\(^1\). However, in 1967 the International Olympic Committee introduced the first List of Prohibited Substances and implemented anti-doping testing at the Summer Olympic Games in Mexico in 1968\(^1\). Today, the World Anti-Doping Agency (WADA) is coordinating the anti-doping movement and developing anti-doping policies with the aim of providing equal opportunities, fair competition and protecting the health of athletes. However, the anti-doping system is not perfect, and when the development of tests for detection of current prohibited substances or methods is successful, athletes wishing to cheat likely change the applied doping methods\(^2\). One of the most widespread doping practices in endurance sports is blood doping, defined by WADA as “the misuse of certain techniques and/or substances to increase one’s red blood cell mass, which allows the body to transport more oxygen to muscles and therefore increase stamina and performance.” Blood doping has a long history within sports\(^2\), and is likely popular as it represents a relatively easy and low-risk method to improve aerobic exercise performance substantially and can be difficult to detect\(^3\). Furthermore, the estimated prevalence of doping is high\(^4-6\), up to \(~45\%\) in the World Championships of athletics in 2011\(^6\). Thus, continued research within detection of blood doping is necessary to reduce the prevalence and increase the likelihood of catching cheating athletes. The present thesis will add to the continuation of anti-doping research within blood doping.