

## ***Measurement of hematocrit in DBS samples by near-infrared (NIR) spectroscopy***

**Andreas Thomas, Mario Thevis** (German Sport University Cologne, Germany)

### **Project overview**

In order to obtain reliable quantitative data from dried blood spot samples (DBS), the measurement of hematocrit is needed. Therefore, the measurement of hematocrit on DBS will be established in this project using near infrared (NIR) spectroscopy, a non-destructive approach. It is planned to analyse the hematocrit value from three different types of blood sampling:

1. Sysmex measurement from venous blood;
2. Measurement of capillary blood by means of a centrifuge;
3. NIR analysis from DBS cards.

While Sysmex and centrifuge measurement represent established approaches, they will serve as reference methods. The comparison to the NIR data will potentially provide a reliable, non-destructive and comparable alternative to these reference methods.

It is planned to collect samples from 10-20 healthy volunteers with each respective sampling approach on the same day. Different degrees of drying (over time) will be evaluated in order to set reliable humidity for NIR measurements. Additionally, the potential effects of the NIR exposure on the subsequent analysis will be evaluated for selected model compounds by measuring DBS samples before and after NIR exposure. Subsequently, the DBS samples (after in-house NIR analysis) will be sent to another laboratory with installed NIR measurement for comparison (method transfer). Finally, a preliminary study is planned, which consists of the determination of the hematocrit from the Tasso sampling devices (with a different absorbent sample support) with NIR in comparison to the cellulose-based DBS cards.