4   SUMMARY

The aim of this thesis was the investigation of the association between relative telomere length (RTL) and various clinical endpoints in well-phenotyped cohorts with atherosclerosis and/or chronic kidney disease (CKD). A major goal was the establishment of a highly standardized high-throughput RTL measurement method to ensure high quality data for epidemiological approaches.

Telomere length is proposed to reflect biological age which includes individual's physiology status in addition to chronological age. The deterioration is attended by increased frequency of disease occurrence. To assess the role of RTL in diseases, we performed association analyses in following studies: (1) in a male cohort with symptomatic peripheral arterial disease (PAD) and age- and diabetes-matched controls with the aim to gain more insight into the link between cellular senescence and PAD, (2) in a population with CKD of moderate severity to evaluate the association of RTL with prevalent cardiovascular disease (CVD), with kidney function and CKD duration, and (3) in two independent prospective cohorts with mild to severe CKD which aimed to assess the association of RTL and the progression of CKD.

Results showed (1) a clear association between RTL and PAD with a slight attenuation when accounting for classical risk factors and excluding patients with prevalent CVD. Furthermore, we found (2) a highly significant independent association of RTL with the risk of CVD. The strongest association was noticed for cerebrovascular disease especially interventions at the carotid arteries as well as for aortic aneurysms. And (3) an effect modification by active smoking and diabetes status on the association of RTL and progression of CKD was observed.

An additional major goal was to investigate the influence of DNA extraction method on results of RTL measurement by quantitative polymerase chain reaction approach. This methodological comparison clearly demonstrates an influence of the DNA extraction method on the measured RTL. Consequences of these findings were illustrated and its consideration in epidemiological studies is of great importance.