Mate choice for physically attractive partners is common in animal kingdom, including humans. In evolutionary biology, traits perceived as attractive are hypothesized to reflect an individual's biological condition, and choosing physically attractive partner would ensure greater reproductive success. Body and face masculinization is positively related to androgens levels and consists an important component of men's physical attractiveness. From the evolutionary point of view, sexual selection should promote the maximal expression of attractive traits. However, inter-individual differences in masculinity level, suggest that there are some factors limiting the expression of masculine traits. According to one of the evolutionary hypotheses, physically attractive traits impose a physiological cost on male organism, that can be born only by individuals of better biological condition. Studies aiming to find what are the physiological costs related to high androgens levels, necessary to produce and maintain masculine traits, are still in the centre of interests of evolutionary biologists. This physiological cost should be the main cause of phenotypic differences between men in better and worse biological condition, allowing to distinguish them in mating context. This means that only men in better biological condition are able to bear the cost of high androgens and develop more masculine phenotype (attractive for women), whereas men in lower biological condition, unable to meet the cost of high testosterone (without lowering their general health, survival or reproduction rates) will have more feminine phenotype. However, despite many studies on the role of masculine characters as cues of men's biological condition, it is still unknown what physiological mechanisms can ensure the honesty of masculinity as a biological signal, i.e. what physiological costs are related to development and maintenance of masculine phenotype. According to the oxidative handicap hypothesis the reliability of masculine traits as indicators of physical condition is ensured by the pro-oxidative (stimulating free radicals production) properties of the main androgen - testosterone. Heightened free radicals production, accompanied with insufficient antioxidant body capability, leads to increased oxidative stress level, underlying many physiological disorders, impaired reproductive function, and accelerated aging. Thus, according to this hypothesis, only men with high antioxidants levels can afford high testosterone level. The results of animal studies seem to confirm the oxidative handicap hypothesis, but its validity has not been verified in humans yet. Thus, the main goal of this project is to test whether men differ in terms of antioxidant potential (measured with various antioxidants levels and total serum antioxidant capacity) and/or oxidative stress markers levels (products of oxidative damage to lipids, proteins and DNA), as a function of their phenotypic masculinity. The study will be conducted in 200 healthy men, aged 30-40 years, controlling for factors that may impact oxidative stress level (body adiposity, general health, lifestyle, carriage state of latent pathogens, cortisol level). Masculinization will be measured based on various, sexually dimorphic body characteristics (e.g. musculature, shoulder-to-hip ratio, second to fourth digit ratio, face masculinization, etc.), voice acoustic parameters, strength, physical endurance, and androgens levels (testosterone and DHT). Oxidative balance will be measured comprehensively, based on antioxidants levels, total antioxidant capacity, and markers of oxidative stress. In the analyses, the relationship between basal levels of androgens, markers of oxidative balance and masculinization level will be tested. Also, part of the participants will be subjected to experimental induction of reactive oxygen species production (by vaccination – evoking immune response and increasing oxidative stress; or physical exercise – increasing metabolic rate and oxidative stress level), for the analyses of changes in oxidative balance after stimulation in men, depending on the masculinization level. We assume that more masculinized men will be characterised with greater antioxidant potential and lower levels of oxidative stress markers after the stimulation. We will also analyse if men differ in the levels of physiological markers, related to long-term health (hsCRP, klotho, telomerase, homocysteine), depending on the masculinization level. This will allow you to estimate the long-term cost of high androgens levels maintenance. Such study design will allow to reliably assess if androgens levels and masculinization level in men are related with antioxidant capacity and the physiological cost in terms of oxidative stress, and whether the expression of sexually dimorphic traits can be an indicator of a man's ability to bear and minimize the cost of high androgens levels, thus a cue of his biological condition.