DESCRIPTION FOR THE GENERAL PUBLIC

According to WHO, 285 million people are estimated to be visually impaired worldwide: 39 million are blind and 246 million have low vision (www.who.int/mediacentre/factsheets/fs282/). Age-related macular degeneration (AMD) is the leading cause of blindness in the elderly population in western countries. Due to the absence of an effective treatment the number of patients severely disabled by AMD is expected to increase more than 50% in the next 20 years. The disease has a tremendous impact on the physical and mental health of the geriatric population and their families and it is becoming a major public health and financial burden. Direct medical costs of AMD care are estimated at approximately $2.8 billion per year in the US and about $2.6 billion per year in Australia, 101.1 million Euros in UK, 60.5 million Euros in Italy, 91.4 million Euros in Germany and 51.3 million Euros in France.

AMD is characterized by a progressive loss of central vision attributable to degenerative and neovascular changes in the macula, a highly specialized region of the central retina responsible for fine and colour vision. AMD is divided into slow progressing dry form (80–85% of cases) and wet, neovascular form (15-20%),that can drive patient blind within weeks. The prevalence of AMD in the age-category of 65–74 is 15%, 75–84 25%, and 85 and older 30%, respectively. A reasonable overall estimate of the incidence of advanced AMD in persons aged 65–74 years is 1%, increasing to 5% in the age-category of 75–84 years, and up to 13% in 85 years old and above. In Poland, 14000 new AMD patients are recorded each year, and as such, AMD is commonly called a “blindness epidemy” (http://retinaamd.org.pl/wp-content/uploads/2016/02/Audyt- raport.pdf). Despite extensive research in the area, AMD pathogenesis is still not clear, it is considered as a complex, multifactorial disease. There are some known risk factors – genetic and environmental (smoking, obesity, age, hypertension). On the cellular level, impaired autophagy has been proven to be of great importance.

Tear film is a thin liquid layer covering the eye, being responsible for its protection, lubrication and nutrition. Unnoticeable on a daily basis, its dysfunction can be really bothering, patients suffering from “dry eye” would admit. For many research groups spread all over the world it is also an information source, which if properly investigated, can give an insight in processes going on both topically and systemically. Tissue protein composition, called proteome, is of particular interest, as they play crucial role on a cellular level, being responsible for cells structure, shape, movement, communication, nutrition and many others. Analogically to genome, which is like a map of all genes, human proteome map has recently been developed. Due to high complexity, it is constantly being updated. In our research we try to develop a proteome map for tear film of AMD patients. This kind of research has already been conducted for many other diseases like diabetes, cancer or dry eye syndrome, with a successful outcome of finding novel protein biomarkers that are specific for a certain type of disease. Finding them creates a foundation for future development of screening diagnostic tests, allowing treatment to be introduced faster and more precisely. On the top of that, accurate knowledge of protein composition gives better insight into the diseases etiopathology, helping in creation of complex therapeutic strategy involving prophylaxis, screening and treatment.