

Thomas Sydenham wrote in the seventeenth century that ‘A man is as old as his arteries’. This aphorism has been recently revisited through the concept of early vascular aging (EVA) syndrome, which is generally defined as a state of accelerated aging of the vessels that cannot be explained solely by metrical age. EVA can be diagnosed in individuals who present with abnormally high stiffness of the arteries with respect to their age and sex category. Arterial stiffness is thought to reflect a cumulative damage of hypertension and other risk factors, such as obesity, diabetes, high cholesterol and smoking on the arterial wall along with metric aging. The mechanisms underlying development of EVA are not completely understood. Therefore, the project proposes to advance knowledge related to causes and consequences of arterial stiffness by an interdisciplinary approach combining clinical knowledge with recent discoveries in imaging and molecular biology. Our project focuses on novel emerging and modifiable cardiometabolic risk factors: neurotensin, vasopressin and adrenomedullin. We will verify whether high levels of these hormones predispose to premature vascular aging. We will study hypertensive patients using the most sophisticated imaging tools allowing high-precision assessment of small and large arteries. The novel approach might identify those subjects, who are particularly likely to develop cardiovascular disease such as myocardial infarction or stroke. Consequently, the proposal might have important implications for health prevention, including healthy aging. Furthermore, it might lead to the development of new therapies, diagnostic methods and medical technologies.