

Wingless-type inducible signaling pathway protein-1 inflammation, diabetes and aging

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Abstract — Obesity is a growing global health issue linked to the development of type 2 diabetes and other aging associated conditions like cancer and neurocognitive disorders. Adipose tissue dysfunction results in altered adipokine secretion, low-grade inflammation and ectopic fat accumulation. Recently, our group identified Wnt1-inducible signaling pathway protein-1 (WISP-1) as a multifunctional factor in inflammatory and fibrotic processes in a cell-context-specific role.

Keywords — aging, inflammation, obesity, type 2 diabetes

Obesity is a growing global health issue linked to the development of type 2 diabetes and other aging associated conditions like cancer and neurocognitive disorders [1]. Adipose tissue dysfunction results in altered adipokine secretion, low-grade inflammation, and ectopic fat accumulation [2]. Recently, our group identified Wnt1-inducible signalling pathway protein-1 (WISP-1 or CCN4) as inflammatory adipokine, which suppress insulin signalling in muscle cells and hepatocytes, contributing to obesity and associated diseases [3-5]. In further studies, a correlation between *WISP-1* and body weights as well as metabolic parameters such as fasting glucose and insulin levels in gestational diabetes and type 2 diabetes was described [5-7]. In addition, recent studies suggest possible effects of circulating WISP-1 on fat cell differentiation in animals [8]. The underlying mechanisms still need clarification and are currently investigated. In humans, the expression of *WISP-1* in the visceral adipose tissue and liver positively correlated with the body mass index [3, 7]. An association of WISP-1 with inflammatory markers and transforming growth factor- β in humans and mice was demonstrated [9]. Furthermore, recently published data links WISP-1 to fibrosis in different tissue [9-13]. In contrast, WISP1 is required for efficient muscle regeneration and loss of WISP1 during aging contributes to age-related regenerative failure of skeletal muscle [14]. Taken together, WISP-1 is a multifunctional factor in inflammatory and fibrotic processes in a cell-context-specific role. Based on recently findings, WISP-1 is a promising target for future research studies in the field of obesity, fibrosis and ageing

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