

THE EMERGING BENEFITS OF RENALASE BASED ON PRECLINICAL STUDIES: THE CURRENT PERSPECTIVE

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The Mammalian Gene Collection Project enabled the discovery of a novel kidney enzyme, subsequently named renalase in 2005. Renalase was initially identified in proximal renal tubules, however the following research reveals its broad pattern of tissue expression, which includes the heart, brain, liver, pancreas, intestines, skeletal muscles, and the eyes. Mounting studies that followed set the stage for renalase's pleiotropy to the level of cancer, particularly as a molecular driver for specific cancers, such as pancreatic, melanoma, renal, and breast cancer. However, the most intriguing of the emerging findings indicated some promising benefits regarding renalase's expression in the human placenta, from the earliest stages of its development, suggesting its relevant role in human growth and gestation. The observation of renalase's enzymatic activities, particularly its interference with catecholamines metabolism, and regulation of plasmatic concentration, initially lead to the conclusion that renalase may significantly affect blood pressure regulation. Given its more recent behavior as a pro-survival agent, particularly in the event of various organ injuries, and its potential to lessen the extent of an acute injury, renalase was assessed as a potentially relevant therapy option for diverse pathologies.

This review comprehensively summarizes the most up-to-date of results of preclinical studies, indicating the discovery that renalase functions as a pleiotropic molecule that likely protects different organs (kidney, heart, liver, intestines) against ischemic and toxic injuries. It also provides insight into renalase's role as a survival factor for tumor cells, since we now know that dysregulation of renalase signaling enables the survival and growth of melanoma and pancreatic cancer cells.

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