

Conference Series LLC Joint International Event on
5th European Immunology & Innate Immunity
July 21-23, 2016 Berlin, Germany

The role of tissue-specific type II 5'-deiodinase enzyme activities in Graves' orbitopathy and systemic sclerosis: A new candidate in thyroid autoimmunity

Ildiko Molnar
EndoMed, Hungary

Type II 5'-deiodinase enzyme (DII) activity is responsible for T₄ conversion to T₃ resulting in the majority of intracellular T₃ concentration. DII is a membrane-anchored protein characterized by tissue-specificity; highly expressed in thyroid, pituitary, skeletal, eye and cardiac muscles, brain, adipose tissue and bone. Decreased DII activity leads to hypothyroidism in euthyroid sick syndrome. We demonstrated DII expression in thyroid, eye and skeletal muscle tissues by immunohistochemistry using immunized guinea pig and patients sera with Graves' orbitopathy. Decreased DII activities were measured after adding proinflammatory cytokines and patients sera with hyperthyroid Graves' orbitopathy and systemic sclerosis. Antibodies to DII inhibited the mitogen-activated protein kinase (MAPK) activation in thyroid tissue. Proinflammatory cytokines (IL-6, TNF α , IFN γ) inhibited thyroid DII activities in dose-dependent manner (V_{max} : 4.1×10^{-3} pmol/mg/min for IL-6; 0.18 pmol/mg/min for TNF α ; 0.23 pmol/mg/min for IFN γ). Hyperthyroid patient sera with Graves' orbitopathy decreased better thyroid DII activities than eye muscle DII ones (3.99 ± 5.79 vs. 7.66 ± 10.49 pmol/mg/min, $P < 0.05$, $n = 26$). Patient sera with systemic sclerosis (SSc, $n = 19$) decreased DII activities compared to those in controls ($n = 16$) (4.99 ± 1.04 vs. 2.88 ± 0.61 pmol/mg/min, $P < 0.0001$). Immunized guinea pig and Graves' patient sera with anti-DII antibodies resulted in relevant inhibition of MAPK activation. In conclusion, DII protein can be a new autoantigen in thyroid autoimmunity, particularly in Graves' orbitopathy. DII activity blocking cytokines could be responsible for low FT₃ levels causing euthyroid sick syndrome in systemic sclerosis. The difference in tissue-specific DII activities could be implicated in the development of orbitopathy in hyperthyroid Graves' disease.

Biography

Ildiko Molnar has completed her PhD in the special field of Graves' Ophthalmopathy at the Hungarian Academy of Science. Her work and research connected her to Kenezy County and Teaching Hospital from 1977 to 2008. Her research activities are on field of internal medicine, endocrinology, immunology and allergology. Currently she is the Chief of EndoMed, Immunoendocrinology and Osteoporosis Centre, Private Outpatient Clinic from 2008. She is an expert in laboratory methods (ELISA, blotting, allergy testing) and DXA measurement. She has published more than 53 papers in reputed journals, 16 chapters and 2 books.

Notes: