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Aged Human Thymus Hassall's Corpuscles are Immunoreactive for IGF-I and IGF-I Receptor

TSVETANA TS. MARINOVA,[1*] LYUBOMIR D. SPASSOV,[2] VESELIN I. VLASSOV,[2] VILI V. PASHEV,[2] MAYA D. MARKOVA,[3] VARBAN S. GANEV,[1] RALITSA S. DZHUPANOVA,[1] AND DOYCHIN N. ANGELOV[4]

[1]Department of Biology, Medical Genetics and Microbiology, Medical Faculty, Sofia University "St. Kliment Ohridski," Bulgaria
[2]Clinic of Surgery and Division of Pathology, University Hospital "Lozenets", Faculty of Medicine, Sofia University "St. Kliment Ohridski," Bulgaria
[3]Department of Biology, Medical Faculty, Medical University of Sofia, Bulgaria
[4]Department of Anatomy I, University of Cologne, Cologne, Germany

ABSTRACT

Although Hassall's corpuscles have been proposed to act in both maturation of developing thymocytes and removal of apoptotic cells, their function remains an enigma. The involvement of insulin-like growth factor I (IGF-I) in the local autocrine and paracrine control of T-cell development in human thymus is still unclear. In this study, we investigated the structure and distribution of IGF-I and IGF-I receptor (IGF-IR)-immunopositive Hassall's corpuscles in aged human thymus using bright-field immunohistochemistry and immunoelectron microscopy. We report new immunocytochemical data for the presence of IGF-I/IGF-IR double-immunopositive Hassall's corpuscles in structurally preserved regions of age-involuted thymus and discuss the involvement of these unique thymic components in the local regulation of T-cell development and thymus plasticity during aging by IGF-I/IGF-IR-mediated cell signaling pathway. Anat Rec, 292:960–965, 2009. © 2009 Wiley-Liss, Inc.

Key words: human; thymus; Hassall's corpuscles; IGF-I; IGF-IR; electron microscopy

Hassall's corpuscles are unique components of the thymus, which provide developing thymocytes with paracrine and juxtacrine signals to ensure their proper functional maturation during the intrathymic lymphopoiesis (Bodey et al., 2000a; Raica et al., 2006). Although these bodies have been proposed to act in both maturation of developing thymocytes and removal of apoptotic cells, their function remains an enigma (Nishio et al., 2000, 2001; Hale and Markert, 2004; Watanabe et al., 2005).

Accumulating evidence shows that human thymic cells produce and express insulin-like growth factor I (IGF-I) (De Mello-Coelho et al., 2002; Geenen, 2003; Marinova et al., 2008). Astonishingly, despite the generally acknowledged roles of IGF-I in the ontogeny (Kecha et al., 1999, 2000; Kelley, 2004), generation, and survival of T-cells (Hinton et al., 1998; Montecino-Rodriguez et al., 1998), little is known about the mechanism(s) of IGF-I signaling pathway in the local control of T-cell development (Velcheti and Govinden, 2006; Strickler et al.,

Abbreviations used: EC = epithelial cells; EM = electron microscopy; HC = Hassall's corpuscle; IGF-I = insulin-like growth factor-I; IGF-IR = insulin-like growth factor-I receptor; nm = nanometers; μm = micrometers.

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*Correspondence to: Tsvetana Tsankova Marinova, MD, PhD, DmedSci, Department of Biology, Medical Genetics and Microbiology, Medical Faculty, Sofia University "St. Kliment Ohridski," 1 Kozjak Street, BG-1407 Sofia, Bulgaria. Fax: (+359 2) 962-4771. E-mail: tsvetamarin@yahoo.com or tsmarinova@med.uni-sofia.bg (or) Doychin Nikolov Angelov, MD, PhD, Anatomical Institute University of Cologne, Joseph-Stelzmann-Strasse 9, 50931 Cologne, FR Germany. Fax: (+49221) 478-87893. E-mail: angelov.anatomie@uni-koeln.de

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