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Contents

Volume 292, Number 7, JULY, 2009

ARTICLES

Cover/Oral Biology

Ken Yoshimura, Natsuki Hama,
Junji Shindo, Kan Kobayashi,
and Ikuo Kageyama

- 921 Light and Scanning Electron Microscopic Study on the Tongue
and Lingual Papillae of the Common Hippopotamus,
Hippopotamus amphibius amphibius

Bone Biology

Megan P. Wilson, Nora R. Espinoza,
Sagar R. Shah, and Richard W. Blob

- 935 Mechanical Properties of the Hindlimb Bones of Bullfrogs and
Cane Toads in Bending and Torsion

Cancer Biology

Yan-Lin Wei, Yun Liang, Lei Xu,
and Xiao-Ying Zhao

- 945 The Antiproliferation Effect of Berbamine on K562 Resistant
Cells by Inhibiting NF- κ B Pathway

Gastrointestinal Biology

Sebastian C.J. van der Putte
Published online 3 June 2009

Maria Albertina de Miranda Soares,
Monica A. Okada,
Cristina Lucia Sant'Ana C. Ayub,
and José Rosa Gomes

- 951 The Development of the Human Anorectum

- 955 Effects of Fasting at Different Stages of Lighting Regimen
on the Proliferation of Jejunal Epithelial Cells During Rat
Pup Weaning

Lymphatic Biology

Tsvetana Ts. Marinova, Lyubomir
D. Spassov, Veselin I. Vlassov, Vili V.
Pashev, Maya D. Markova, Varban S. Ganey,
Ralitsa S. Dzhupanova,
and Doychin N. Angelov
Published online 1 June 2009

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

(continued on next page)

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

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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-involved 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; μ m = micrometers.

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