Journal of Basic and Clinical Physic

Comparative expression analysis of phospholipid binding protein annexina1 in nephrogenesis and kidney cancer

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DOI: https://doi.org/10.1515/jbcpp-2019-0179 | Publi

Abstract

Background

The expression in the glomerular mesangial cells, papillary, and collecting duct cells demonstrated annexin A1 (AnxA1)'s role in specific renal functions. With varying concentrations of calcium (Ca^{2+}), it is considered to regulate cellular processes such as cell proliferation, apoptosis, and clearance of apoptotic cells by forming ceramides, a key lipid mediator of apoptosis. It also participates in tumorigenesis based on its location. On account of these features, we investigated the expression of this apoptosis-associated protein in fetal kidneys at different gestational periods, mature kidneys and in kidney

cancer tissues in order to localize and possibly characterize its role during nephrogenesis and renal tumors.

Methods

AnxA1 expression was evaluated by an immunohistochemistry technique in "paraffin-embedded" renal tissue sections from autopsied fetuses at different gestational ages, in mature kidneys and renal cancer tissues.

Results

The current study data demonstrated that AnxA1 is expressed in the mesangial cells and podocytes of maturing glomeruli in the developing renal cortex of fetal kidneys at 14 to 19 weeks of gestation. The expression in the mesangial cells declined in later weeks of gestation and persisted into adulthood. AnxA1 expression increased with the progression of clear cell renal cell carcinoma (CCRCC) and also in other cancer types indicating a potential role of the protein in tumorigenesis.

Conclusions

We presume that AnxA1 in the podocytes and mesangial cells play important roles in various signaling pathways in the functioning of the glomerulus. These results and concepts provide a framework to further dissect its biological properties and thereby develop diagnostic, prognostic, and therapeutic strategies targeting the molecule in various renal pathologies.

Keywords: annexinA1; fetal kidney; nephrogenesis marker; phospholipid binding protein; renal cell carcinoma

ARTICLE INFORMATION

Received: 2019-06-24

Accepted: 2019-09-10

Published Online: 2019-11-14

Citation Information: Journal of Basic and Clinical Physiology and Pharmacology, Volume 31, Issue 4, 20190179, eISSN 2191-0286, ISSN 0792-6855, DOI: https://doi.org/10.1515/jbcpp-2019-0179.

JOURNAL + ISSUES

Journal of Basic and Clinical Physiology and Pharmacology

Volume 31: Issue 4

DETAILS

The journal publishes novel research in the physiological and pharmacological sciences, including brain research, cardiovascular-pulmonary interactions, hematology, immune response, inflammation, metabolism, oxidative stress, and phytotherapy. It also publishes papers on cutting-edge techniques in cellular and molecular biology that link descriptive and behavioral studies with cellular and molecular mechanisms.

Online ISSN: 2191-0286

First published: 01 Dec 1986

Language: English

Language: English

Publisher: De Gruyter