THE 67TH INTERNATIONAL

OPEN READINGS

CONFERENCE FOR STUDENTS OF PHYSICS AND NATURAL SCIENCES

BOOK OF ABSTRACTS | 2024

Vilnius University

VILNIUS UNIVERSITY PRESS

Editors:

Martynas Keršys
Rimantas Naina
Vincentas Adomaitis
Emilijus Maskvytis

Cover and Interior Design:

Goda Grybauskaitė

Vilnius University Press
9 Saulėtekio Av., III Building, LT-10222 Vilnius
info@leidykla.vu.lt, www.leidykla.vu.lt/en/
www.knygynas.vu.lt, www.journals.vu.lt

Bibliographic information is available
on the Lithuanian Integral Library Information System (LIBIS) portal www.ibiblioteka.lt
ISBN 978-609-07-1051-7 (PDF)

DEVELOPMENT AND OPTIMIZATION OF A MONOCLONAL ANTIBODY-BASED SYSTEM FOR QUANTIFICATION OF hBiP

Gabija Klimavičiūtė[1], Evaldas Čiplys[2], Rimantas Slibinskas[2], Aurelija Žvirblienė[1], Martynas Simanavičius[1]

[1]Vilnius University, Life Sciences Center, Institute of Biotechnology, Department of Immunology
[2]Vilnius University, Life Sciences Center, Institute of Biotechnology, Department of Eukaryote Gene Engineering
gabija.klimaviciute@gmc.stud.vu.lt

hBiP (human binding immunoglobulin protein) is one of the most important endoplasmic reticulum (ER) chaperone proteins, which plays a key role in protein folding, export into the ER, assembly, signal transduction and calcium ion homeostasis[1]. When ER stress occurs during cancer and neurodegenerative illnesses, hBiP appears to be involved in disease progression, tissue damage and autoimmune inflammation[2][3]. Therefore, hBiP could be a potential biomarker for detecting and monitoring these diseases. Monoclonal antibodies are great biotechnological tools for investigation of various proteins and their roles[4]. Antibodies could be used in the development of immunoassays for the quantification of their targets. In this study, we aim to develop and optimize the assay for hBiP detection and concentration determination while using monoclonal antibodies in the sandwich ELISA method. Test conditions were optimized, such as type of plate, immobilization and blocking solutions and monoclonal antibodies pair. It is important to develop a reliable test for quantification of hBiP to detect and monitor previously mentioned diseases, hence the accuracy of the test was evaluated. When developed, such a test can contribute to improve the understanding of the role of hBiP in disease pathogenesis and facilitate the development of personalized medicine approaches.

[1] Ni, M., Zhang, Y., Lee, A. S. Beyond the Endoplasmic Reticulum: Atypical GRP78 in Cell Viability, Signalling and Therapeutic Targeting. Biochem J 2011, 434 (2), 181-188.
[2] Zhang, L.-H., Zhang, X. Roles of GRP78 in Physiology and Cancer. J Cell Biochem 2010, 110 (6), 1299-1305.
[3] Gorbatyuk, M. S., Gorbatyuk, O. S. The Molecular Chaperone GRP78-BiP as a Therapeutic Target for Neurodegenerative Disorders: A Mini Review. J Genet Syndr Gene Ther 2013, 4 (2), 128.
[4] Zahavi, D. Weiner, L. Monoclonal Antibodies in Cancer Therapy. Antibodies (Basel) 2020, 9 (3), 34.