Short Communication

Electrochemical Studies on Bactericidal Mechanism of Human Lactoferrin and Its Demand for Microenvironment

Junyi Huang\textsuperscript{1,2,*}, Tao Liu\textsuperscript{2,**}, Jie Cao\textsuperscript{2}, Zhengjun Wu\textsuperscript{1}, Xian-yan Liao\textsuperscript{2}, Hong-sheng Song\textsuperscript{2,**}

\textsuperscript{1} State Key Laboratory of Dairy Biotechnology, Bright Dairy & Food Co. Ltd., Shanghai 200072, China;
\textsuperscript{2} Key Laboratory of Food Nutrition and Function, School of Life Sciences, Shanghai University, Shanghai, 200444, China

\textsuperscript{**}Co-first author: the contribution for this article is equal to Junyi Huang.
\textsuperscript{*}E-mail: jy-huang@i.shu.edu.cn, hssong@staff.shu.edu.cn

doi: 10.20964/2017.02.57

Received: 26 July 2016 / Accepted: 4 December 2016 / Published: 30 December 2016

The bactericidal mechanism of human lactoferrin (LF) was analyzed by employing bioelectrochemistry technique. The result showed that LF bound to lipopolysaccharides (LPS) and caused release of LPS, resulting in formation of ion channels in the mimic biomembrane. Furthermore, a survey of microenvironment factors for bactericidal activity of LF was conducted. In weakly alkaline condition of pH 8, LF exhibited maximally bactericidal activity. The bactericidal activity of LF was closely related to its concentration. In addition, the bactericidal activity would decrease with a higher concentration of metal ions. Divalent cations showed greater influence on the bactericidal activity than that of monovalent cations.

\textbf{Keywords:} Lactoferrin; Bactericidal mechanism; Bioelectrochemistry; Microenvironment

FULL TEXT

© 2016 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/4.0/).