J Clin Cell Immunol 2014, 5:5
http://dx.doi.org/10.4172/2155-9899.S1.019

OMICS Group Conferences
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3rd International Conference and Exhibition on
Clinical & Cellular Immunology
September 29-October 01, 2014 DoubleTree by Hilton Baltimore-BWI Airport, USA

Mechanism of cellular immune response to strange objects

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The interactions of cellular transport across cellular wall promote stability internal energy of a cell via creating extracellular chemical potential and intracellular chemical potential which induce different electrical charges on external and internal cellular membranes of a cellular wall. Thus the formed different cellular capacitors into cellular wall are functioned. Just the mechanism of mutual interactions between cellular capacitors of all cells and an organism promote remote reactions across distance for immune responses on strange objects. Interactions between all cells of an organism occur due to remote reactions across distance as the results of cellular capacitors operations via production of resonance waves. Interactions between cellular capacitors of cells maintain common stability of internal energy both in cells and in an organism. Penetration of strange high-molecular substance into an organism creates local change of chemical potential and promotes remote reactions across distance of cellular capacitors via cellular waves on common molecular wave of strange high-molecular substance, due to the wave function of any molecule which is determined as the total wave functions of the nuclear orbitals, according to Schrödinger (wave) equation of linear combination of atomic orbitals (MO LCAO). The forming resonance waves cause attraction the immune cells to strange high-molecular substance and create the contact reaction of decomposing the high-molecular substance of the strange object, ruining it. Biophysical mechanism of immune cell's remote reactions transit into contact biochemical immune reactions like, Phagocytosis, Autophagy etc.

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IFN-γ, IL-8, IL-10 Regulate surface molecules expression in natural killer cell line

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Natural Killer (NK) cells are dominant effectors of early host defense. Their activity depends on balance of signals from activation and inhibition receptors. Various soluble factors, including cytokines have an influence on phenotype of NK cells.To investigate this effect, we used pro-inflammatory and anti-inflammatory cytokines. IFN-γ induces Class II major histocompatibility complex (MHC) molecule expression. IL-8 basic functions include chemotaxis, activation and the induction of neutrophil infiltration. IL-10 is an anti-inflammatory cytokine with multidirectional effects in immunoregulation and inflammation. Assay was performed using NK-92MI natural killer cell line. Cells were treated with 3 different doses of cytokines (IFN-γ, IL-8, IL-10, separately) for 24 hours. Surface molecules expression was assessed by flow cytometric analysis using fluorochrome-conjugated mABs and FACSC. IFN-γ significantly ($p<0.05$) upregulated expressions of KIR2DL1, KIR3DL1, CD11a, CD11b, CD18, CD29, CD44 (dose-dependent), CD47 (dose-dependent), CD184 (dose-dependent), CD49d and CD54. Cells stimulated byIL-8 showed significally higher expression level ofCD29. However, IL-8 downregulated KIR2DL3, KIR2DL4, KIR3DL1 (dose-dependent), KIR2DS4, CD11b (dose-dependent), CD18, CD49d (dose-dependent), CD44 and CD58. Significantly increased expression of CD47, CD58 (dose-dependent) and CD49 was discovered in cells treated with IL-10, but expression of KIR2DL1, KIR2DL3, CD29, CD44, and CD184 was significally decreased.

Biography

Larisa Viazmina is a five-year student of biotechnology faculty of Saint Petersburg Chemical Pharmaceutical Academy. She is laboratory research assistant in immunology department of D. O. Ott Research Institute of Obstetrics and Gynecology. Her research interests are related to reproductive immunology, mainly preeclampsia and NK cells.

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