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TITLE

AN ANTIBODY-DERIVED KILLER PEPTIDE (KP) RAPIDLY TRIGGERS PORCINE INFLAMMATORY MONOCYTES, INNATE AND ADAPTIVE T LYMPHOCYTES, TOGETHER WITH TH1 CYTOKINE SECRETION AND CROSS-REACTIVE PRRSV-SPECIFIC AND PCV2-SPECIFIC IFN-GAMMA SECRETING CELLS IN PBMC OF CONVENTIONAL PIGS

Luca Ferrari[1], Giulia Ferrarini[2], Elena De Angelis[1], Benedetta Passeri[1], Giulia Ogno[1], Walter Magliani[3], Paolo Borghetti[1], Paolo Martelli[1]

[1] Department of Veterinary Science, University of Parma, Strada del Taglio, 10 – 43126, Parma, Italy
[2] IZSLER, Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna "B. Ubertini", Unit of Mantova, Strada Circonvallazione Sud, 21/a - 46100, Mantova, Italy
[3] Department of Biomedical, Biotechnological and Translational Sciences (S.Bi.Bi.T), University of Parma, Via Gramsci, 14 – 43126, Parma, Italy

CONTENT

An engineered killer peptide (KP), based on an anti-idiotypic antibody mimicking a yeast killer toxin, showed a wide-spectrum antimicrobial activity against fungi, viruses and parasites in humans and parasites in the dog and mouse. KP was demonstrated to interact with mouse dendritic cells and macrophages, stimulating Th1 responses. In porcine PBMC, KP is able to functionally activate pro-inflammatory CD14+high monocytes and natural killer T (NKT) cells in parallel with CD4+CD8alpha+ T helper (Th) memory cells and CD8beta+ conventional cytotoxic T lymphocytes (CTL) upon prolonged in vitro incubation.
The present study aims at investigating the ability of KP in early modulate the phenotype of porcine immune cells and induce Th1 cytokines to determine the efficacy in triggering cellular reactivity able to potentially influence the early response to two major porcine viruses, namely PRRSV and PCV2.
PBMC from adult pigs were stimulated with KP, or a scramble irrelevant peptide (SP), or kept unstimulated for a time period included between 20 min. and 20 hours, and analyzed by flow cytometry and ELISA. KP pre-incubation or co-incubation conditions were investigated to evaluate the effect on virus-specific IFN-gamma secreting cell responses by ELISPOT.
KP stimulated and maintained an early dose-dependent shift from quiescent to activated pro-inflammatory CD172alpha+CD14+high monocytes and NKT CD3+CD16+ cells. Noteworthy, KP remarkably triggered early and maintained up-regulation of CD8alpha and CD8beta on classical CD3+CD4-CD8alpha+/beta+ CTL and double positive (DP) CD3+CD4+CD8alpha+ Th memory cells, especially expressing high levels of CD8alpha (DP CD4+CD8alpha+high CD8beta+ CTL), associated with IFN-gamma and TNF-alpha release.
KP markedly and synergistically induced high reactivity and cross-reactivity of IFN-gamma secreting cells to PCV2b and particularly to PRRSV-type 1 isolates in vaccinated animals. The results support the efficacy of KP in stimulating Th1-biased immunomodulation and the potential use in vivo as immunomodulator and/or vaccine adjuvant against infections by PCV2 and PRRSV.