# Cytoprotective Potential of Novel Buffalo Casein Derived Bioactive Peptide in Hydrogen Peroxide Induced Oxidative Stress Model

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**Background and purpose:** *In the present era, people daily life style in association with overburdened cellular metabolism leads to oxidative stress related impairement of body functions and, chronic disorders such as cancer, myocardial inflammation, diabetes and aging via extreme production of reactive oxygen species (ROS). So, bioactive peptides from natural sources with short half life and antioxidative cytoprotective effect are gaining supreme importance.*

**Material and methods:** *Among the four bioactive peptides, previously isolated from buffalo casein protein, purified and sequenced in our laboratory, Val-Leu-Pro-Val-Pro-Glu-Lys (VLPVPQK) was found to possesses the highest anti-oxidative potential by ABTS method. In the present investigation, we evaluated the antioxidative potential of the bioactive peptide by ORAC (Oxygen Radical Absorbance Capacity) method and, its cytoprotective enduring effects in $H_2O_2$-induced in-vitro oxidative stress fibroblast model system. Fibroblasts were pretreated with peptide (30, 100, 500ng/ml) for 24 h followed by incubation with 0.2mM $H_2O_2$ for 6 h. After this, effect of peptide on cell surviability, intracellular MDA, ROS, TNF-α and IL-6 level was examined and, oxidative stress related biomarkers such as SOD, CAT, GSH, and LDH were quantified in cell lysate.*

**Result and conclusion:** *Bioactive peptide displayed antioxidative property by ORAC. Therefore, it can be potentially used as a preservative in food for extending the shelf-life of food. Peptide also elevated cell survivability very significantly through balancing anti-oxidative enzymes activity (SOD and CAT), increased GSH level, reduced MDA, LDH, TNF-α and IL-6 level and simultaneously inhibiting $H_2O_2$-induced ROS production in cultured fibroblast cells. Altogether, our results indicated that, peptide demonstrated cytoprotective effects by its anti-oxidative and anti-inflammatory property, suggesting that the peptide can be an effective remedy in treatment of oxidative stress related diseases and skin inflammation disorders.*