# Anti-inflammatory Potential of Novel Buffalo Casein Derived Bioactive Peptide in Oxidative Stress

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#### Background and purpose:

In the modern era, people's daily life style is associated with overburdened cellular metabolism that ultimately leads to oxidative stress related dysfunctions of body and, chronic disorders such as cancer, myocardial inflammation, diabetes and aging via excessive reactive oxygen species (ROS) production. So, bioactive peptides from natural sources with anti-inflammatory cytoprotective effect are gaining much 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 possess the highest anti-oxidative potential by ABTS method. In the present investigation, fibroblasts were pretreated with peptide (30, 100, 500ng/ml) for 24 h followed by incubation with 0.2mM  $H_2O_2$  for 6 h and then, we evaluated the anti-inflammatory potential of the bioactive peptide by testing cell survivability via CFDA-SE staining and, also checking NO, TGF- $\beta$ , TNF- $\alpha$  and IL-6 level in  $H_2O_2$ -induced in-vitro oxidative stress fibroblast model system. After this, effect of peptide on fibroblast cell collagen production and cellular senescence was examined.

### **Result and conclusion**

Bioactive peptide displayed anti-inflammatory property by decreased  $TNF-\alpha$ , IL-6 and nitric oxide (NO), enhanced  $TGF-\beta$  production and thus, promoting cell survival by CFDA-SE staining and reduced senescence associated phenotype. Peptide also elevated cell collagen production very significantly in cultured fibroblast cells. Altogether, our results indicated that, peptide demonstrated cytoprotective effects by its anti-inflammatory property, suggesting that the peptide can be an effective remedy in treatment of oxidative stress related skin inflammatory disorders.