# 水解罗非鱼胶原促进人牙周膜细胞活力及成骨分化的效应

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【摘　要】 **目的**　探讨水解罗非鱼胶原促进人牙周膜细胞活力及成骨分化的作用。**方法**　制备水解罗非鱼胶原 , 原代分离培养人牙周膜细胞（hPDL 细胞）, 分别利用 MTT 试验和 real-time PCR 试验检测水解罗非鱼胶原对细胞活力和成骨分化相关基因 ALP,COL I,OCN 和 RUNX2 的表达的影响 , 运用激光共聚焦显微镜观察成骨分化相关蛋白骨钙蛋白的表达 , 进一步采用 western blot 技术探讨水解罗非鱼胶原对整合素 -ERK 信号通路的作用。**结果**　水解罗非鱼胶原能促进 hPDL 细胞的增殖 , 使 ALP,COL I,OCN 和 RUNX2 的基因上调 , 诱导骨钙蛋白的产生 , 这些生物效应与水解罗非鱼胶原可激活整合素 -ERK 信号通路有关。**结论**　水解罗非鱼胶原具有骨诱导性 , 具有诱导 hPDL 细胞成骨分化的潜能。

【关键词】 水解罗非鱼胶原　人牙周膜细胞　细胞活力　成骨分化　整合素 -ERK 通路

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## Hydrolyzed tilapia fish collagen enhances cell viability and osteogenic differentiation of human periodontal ligament cells

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【**Abstract**】 **Objective**　The aim of the present study was to investigate the effect of hydrolyzed fish collagen (HFC) on the viability and osteogenic differentiation of primary human periodontal ligament (hPDL) cells. **Methods**　In this study, the hydrolyzed fish collagen was extracted from tilapia fish scale, and primary hPDL cells were cultured after dissociation. Cell viability was assessed by MTT assay, the expression of osteogenic genes *Alp, Col I, Ocn* and *Runx*2 was measured by Real Time-PCR, Osteocalcin protein was detected by immunofluorescent staining, and the role of integrin-ERK signaling pathway in this process was tested by western blotting. **Results**　The results revealed that HFC improved the viability of hPDL cells. The expression of osteogenic markers, including *Alp, Col I, Ocn* and *Runx*2, was increased by HFC treatment. HFC induced the production of Osteocalcin, an important osteogenic-related protein, and activated the integrin-ERK signaling pathway. **Conclusion**　HFC induces the osteogenic differentiation of hPDL cells potently, suggestive of an osteoinductive property.

【**Key words**】 Hydrolyzed tilapia fish collagen　Human periodontal ligament cells　Cell viability　Osteogenic differentiation　Integrin-ERK signal pathway

因创伤、感染等因素导致的牙槽骨缺损会导致长期的美观和功能问题，促进牙槽骨再生是口腔手术的主要目的[1]。近年来，采用生物活性材料修复牙槽骨缺损成为研究的热点，目前常用的许多生物材料虽然各有优势，但尚缺乏主动的骨

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