Tissue engineered cartilage using human articular chondrocytes immortalized by HPV-16 E6 and E7 genes

賴文福
Chen WH;Lai WF;Win-ping Deng;Yang WK;Lo WC

摘要

Abstract

Chondrocytes are useful as a cell culture system for studying arthritic degeneration in tissue engineered cartilage. However, primary chondrocytes have short in vitro lifespan and rapid shift of collagen phenotype. In this study, we used a high dosage of retroviral vector LXSN16E6E7 to transduce human primary chondrocytes and obtained an actively proliferating cell line, designated hPi, which expresses HPV-16 E6/E7 mRNA in early passages. Parental primary chondrocytes cease to grow after five passages, whereas hPi could be propagated beyond 100 passages without requiring additional cell elements in defined medium. After 48 passages, hPi can also give many profiles similar to those of parental primary chondrocyte, including type II collagen in mRNA and protein level, aggrecan in mRNA level, lacunae in type I collagen matrices, and morphology with GAG-specific Alcian blue staining. hPi has shown neoplastic transformation, as examined by NOD-SCID mice tumorigenicity assays for 3 months. Our results indicated that human primary chondrocytes could be immortalized by transduction with HPV-16 E6/E7, preserving stable cartilage-specific differentiation markers. The established chondrocyte cell line could provide a novel model to engineer cartilage in vitro and in vivo for cartilage repair research and clinical application. (c) 2005 Wiley Periodicals, Inc