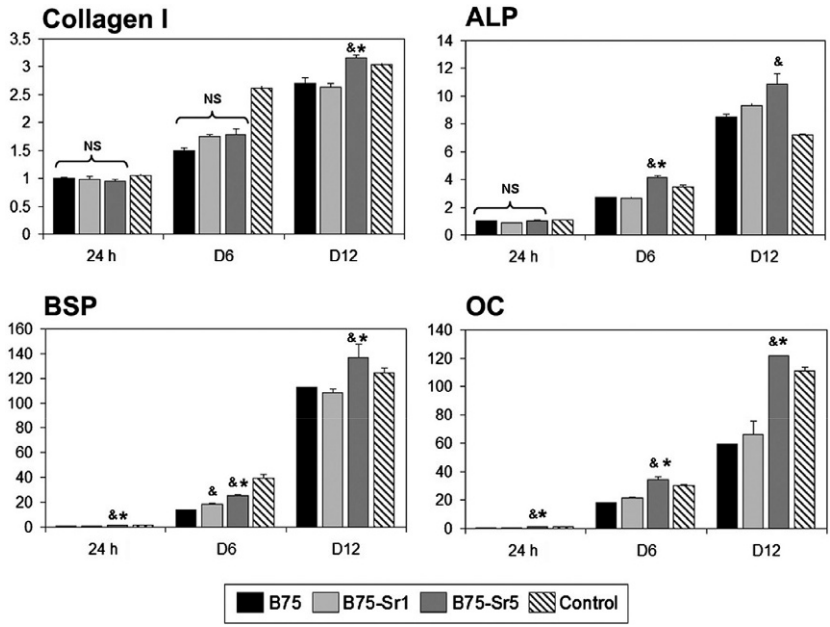

FIG. 6.11 Real-time PCR analysis of gene expression of selected bone protein markers at 24 h, day 6, and day 12 by osteoblastic cells grown with B75, B75-Sr1, and B75-Sr5 particles or without bioactive glass (Isaac et al., 2011).

were observed to be higher for the culture in contact with 45S5 Bioglass as compared to the control (on day 15). After 15 days, a decrease in the ALP was observed. The gene expression for Sox9 type II collagen, Runx2, Type X collagen, Ihh, and aggreccan is depicted in Fig. 6.12 (Asselin Fig. 4). On day 12, chondrocyte master gene Sox9 is expressed all along the culture period and no significant differences could be seen for 45S5 and 60S glass. Type II Collagen and aggreccan gave strong expression on day 15, followed by gradual decrease. On day 12, Runx2 expression is higher for 45S5 Bioglass cultures. Between days 9 and 12, the signaling molecule Indian hedgehog (Ihh) was strongly expressed in 45S5 Bioglass culture. Type X collagen mRNA increased for the primary chondrocytes culture in the presence of 45S5 Bioglass. Zinc-based glasses have also been investigated for osteogenic effects. Sol-gel derived glasses with 5 mol% ZnO yielded enhanced osteoblast proliferation and ALP activity (Du et al., 2006; Murphy et al., 2009; Oki et al., 2004; Balamurugan et al., 2007; Haimi et al., 2009; Lusvardi et al., 2008). It has been observed that 5 mol% Zn containing glass increased ALP activity of human fetal osteoblastic cells (hoppe 157). Lusvardi et al. (2008) observed no significant effect on the adhesion and proliferation of MC3T3-E1 when bioactive glass was doped with Zn, attributed to the slow degradation of BG caused by Zn addition.