

**SUPPLEMENTAL MOVIE 1.** 10% FBS culture system DIC z-scan. The scan proceeds from the glass (0  $\mu\text{m}$ ) to the free surface (16.5  $\mu\text{m}$ ) of the 10% FBS-supplemented construct. A loose, disorganized fibrillar matrix structure appears among the cells at approximately 2.0  $\mu\text{m}$  and persists until 11.0  $\mu\text{m}$ .

**SUPPLEMENTAL MOVIE 2.** 1% FBS + 1% ITS culture system DIC z-scan. The scan proceeds from the glass (0  $\mu\text{m}$ ) to the free surface (42  $\mu\text{m}$ ) of the ITS-supplemented construct. A dense, disorganized fibrillar matrix structure appears among the cells at approximately 2.0  $\mu\text{m}$  and becomes highly aligned by 14  $\mu\text{m}$ . The alignment persists until 25  $\mu\text{m}$ . At this point, the organization of the matrix becomes more random, but the fibrillar matrix density remains high until approximately 38  $\mu\text{m}$ . The last 4  $\mu\text{m}$  is predominantly cellular.