

LATE OSTEOBLAST/EARLY OSTEOCYTE-LIKE CELL LINE FOR VISUALIZING COLLAGEN ASSEMBLY IN LIVING CELLS

Description:

Immortal cell lines representing the late osteoblast/early osteocyte phenotype that stably express a collagen-GFP or collagen-mCherry fusion protein to fluorescently label type I collagen fibrils either red or green. These novel cell lines allow visualization of collagen fibril assembly in living cells over time, which is not possible with existing technologies.

Uses:

1. Screening for drugs that enhance collagen assembly and could therefore have potential as bone anabolic treatments for diseases such as osteoporosis.
2. Screening for drugs that inhibit collagen assembly, and therefore have the potential to prevent fibrosis, etc.
3. Developing approaches for tissue engineering of bone tissues.
4. Investigating mechanisms of tissue destruction (such as the degradation of matrix proteins by proteases that occurs during inflammation).

Advantages:

These novel cell lines allow for the visualization of collagen fibril assembly in living cells over time, which is not possible with existing technologies. The only other approaches that have been used for monitoring collagen assembly in living cells include using fluorescently labeled antibodies or a fluorescently labeled recombinant bacterial protein. These approaches may potentially interfere with the protein function and only label a population of fibrils at one point in time, which can then be followed (i.e. they do not necessarily label new collagen as it is synthesized). The specificity of the bacterial binding protein for type I collagen as opposed to other collagens is unclear and neither of these probes can be used to follow intracellular steps in the collagen assembly pathway, as they do not cross the cell membrane.

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Please visit our website at: <http://www.umkc.edu/ors/ott> for a detailed description of this and other technologies.

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