



Multiple Midbodies as Markers for Multiple Classes of Human Stem Cells

Keywords: Stem cells, Biomarkers, Development, Cancer

Applications

- ✚ Identify and characterize stem cells.
- ✚ Identify and target cancer stem cells.

Background

Currently, there are a small number of markers that are used to identify stem cells. However, to date, no single stem cell marker has been used to characterize all classes of stem cells. This complicates the definition of a stem cell itself and its characterization, as well as the identification and isolation of stem cells from various tissues in discovering novel targets for therapy.

Technology

This invention describes a novel marker of stem cell populations in development and cancer. Dr. Steve Doxsey and Chun-Ting Chen have discovered the presence of multiple midbody (MM) organelles in a cell which segregate with stem cell populations and not other cell types. For example, MMs in the mouse testes are found in the same cell population that stain for the stem cell marker Oct 4, but not in the Oct 4-minus cells. Furthermore, MMs are present in embryonic H9 cultured stem cells and are lost after differentiation into neurons, suggesting that differentiated cells lose MMs while stem cells and putative cancer stem cells accumulate them. MMs are present in all tumor cells tested but not in normal diploid cells.

This is the first indication of a single marker to identify many types of stem cells. Unlike other stem cell markers currently in use, MMs can be seen without special stains as they are visible by basic microscopy techniques. The use of MMs as a marker allows the identification of stem cells in various organs and environments and has many therapeutic applications.

Patents Pending US and National Phase

Salient Features and Competitive Advantages

- ✚ **Novel universal stem cell marker for use in stem cell research, regardless of the source of the stem cells.**
- ✚ **Novel marker for target discovery for cancer therapy, and for other diseases where stem cells are implicated in the pathogenic process.**
- ✚ **Novel marker for further understanding the functions and underlying mechanisms involved in basic cell division and stem cell proliferation.**

Business Opportunity

UMass OTM is seeking statements of interest from parties interested in collaborating and/or sponsoring collaborative research as well as licensing opportunities to further develop, evaluate, or commercialize this technology.

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