code: ES03), MeL1 (NIH code: 0139), or stem cells that express at least one of the following markers characteristic of pluripotent cells: ABCG2, cripto, CD9, FoxD3, Connexin43, Connexin45, Oct4, Sox2, Nanog, hTERT, UTF-I, ZFP42, SSEA-3, SSEA-4, Tral-60, Tral-81. Similarly, the pluripotent stem cell may be an induced pluripotent stem (iPS) cell, which may be derived from non-embryonic sources, and can proliferate without limit and differentiate into each of the three embryonic germ layers. For example an IPS cell line can include but is not limited to BJC1 and BJC3. It is understood that iPS cells behave in culture essentially the same as ESCs.

[0045] In this regard, as is well-known in the context of the technical field, pluripotent stem cells may differentiate into functional cells of various cell lineages from the multiple germ layers of either endoderm, mesoderm or ectoderm, as well as to give rise to tissues of multiple germ layers following transplantation and to contribute substantially to most, if not all, tissues following injection into blastocysts. For example, the pluripotent stem cells may be differentiated into cell lineages of the endoderm that may include but are not limited to the anterior primitive streak (APS) lineage, definitive endoderm (DE) lineage, anterior foregut (AFG) lineage, posterior foregut (PFG) lineage, mid gut hind (MHG) lineage, pancreatic progenitor lineage, or hepatacytic progenitor lineage. Alternatively, the pluripotent stem cells may be differentiated into cell lineages of the mesoderm that include but are not limited to cardiac, lateral plate, paraxial, pre-somitic, somitic mesoderm, intermediate and extra-embryonic mesoderm, or differentiated into cell lineages of the ectoderm that include but are not limited to neuroectoderm, neural crest and surface ectoderm.

[0046] By measuring expression of particular genes and/or protein markers, progress of differentiation of stem cells