

## Rapid and reliable determination of the differentiation state of human embryonic stem cells - TrulyStem kit.

Human embryonic stem cells (hESC) show great promise for cell replacement therapies, drug discovery and toxicology testing. In the future, medical researchers anticipate using technologies derived from stem cell research to treat a wide variety of diseases including cancer, Parkinson's disease, diabetes, heart disease, spinal cord injuries, Amyotrophic lateral sclerosis, and muscle damage. Several therapies based on adult stem cell have already been introduced into clinical practice, such as bone marrow transplants used to treat leukemia.

There is a general lack of rapid, sensitive and quantitative methods for the detection of differentiating human embryonic stem cells. The most important characteristic of ESCs is their pluripotency, or ability to differentiate into all three primitive cell lineages in the body: endoderm, ectoderm and mesoderm. In other words, they can develop into each of the more than 200 cell types found in the adult body when given sufficient and necessary stimulation for a specific cell type. Researchers working with hESCs must continually screen the cells to ascertain pluripotency. A common approach to characterize hESCs today is to test for surface antigens such as the glycolipids SSEA3 and SSEA4, and the keratan sulfate antigens Tra-1-60 and Tra-1-81 by immunohistochemistry or FACS. A much faster and less subjective method to test the differentiation state of hESCs is by measuring the expression of differentiation markers such as Oct4, Nanog and Sox2.

TATAA Biocenter has in collaboration with Cellartis developed the TrulyStem kit as a joint effort to solve the great need for a rapid, quantitative and high through put monitoring method of the differentiation state of hESC cultures.

“The method used in the kit has been developed to meet the need for a new monitoring method in our production of undifferentiated hESC and it has been successfully used for quality control”, says CEO of Cellartis, Mats Lundwall

“We just completed a study in collaboration with Professor Eva Sykova at the Institute of Experimental Medicine AS in Prague on differentiating human embryonic stem cells to neuroprogenitor cells. The new kit was most valuable to follow the process on gene expression level”, says head of R%D of TATAA, Mikael Kubista.

**TrulyStem** is a robust and sensitive multi marker quantitative real-time PCR kit, to measure expression of 13 key genes regulated upon differentiation. The differentiation state of the cells can be assessed by objectively calculating a collective expression index based on the expression levels of the 13 genes.

**About TATAA Biocenter:** TATAA Biocenter with locations in Gothenburg, Sweden, Prague, Czech Republic, Freising, Germany, and Sunnyvale, CA, is leading global provider of real-time PCR services. TATAA Biocenter organizes hands-on training in real-time PCR, and conducts research and development in diagnostics and gene expression profiling based on real-time PCR for industry and the public sector. For course schedule and further information about TATAA Biocenter, see [www.tataa.com](http://www.tataa.com).

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**About Cellartis:** Cellartis AB is a premier provider of human embryonic stem cell (hESC) derived products and technologies which will drive unprecedented innovation in drug discovery and regenerative medicine today and in the future. Today, alongside fully characterized, ethically derived hESC lines, the company offers custom prepared human cardiomyocytes and mesenchymal progenitors derived from hESCs along with stem cell antibodies and tools. Cellartis is engaged in programmes for the production of homogenous populations of hepatocytes suitable for use as bio-tools in industrial applications. In addition, Cellartis has built the world's first large-volume automated production facility for hESCs and can provide hESC for screening campaigns. The company was founded in 2001, has over 50 employees and is located in Gothenburg, Sweden and Dundee, Scotland/UK. For more information, please visit [www.cellartis.com](http://www.cellartis.com). E-mail: [info@cellartis.com](mailto:info@cellartis.com)