

Research Center for Precision Medicine based Intractable Cancer Diagnostics and Therapeutics



Director

Prof. Myung Geun Shin, M.D., Ph.D.

Major research goals

Development of integrated platform for molecular diagnostics, residual disease detection and predicting prognosis using simultaneous targeted nuclear and mitochondrial genome in high risk & intractable cancers

Major research topics

1. Investigation and development of new molecular pathophysiology and selective biomolecular markers in high risk & intractable cancers using targeted nuclear and mitochondrial genome
2. Development of integrated platform for molecular diagnostics, residual disease detection and predicting prognosis using identified new molecular pathways and bio-molecular markers

Major achievements

1. Established single cell culture system for hematopoietic stem cell and nuclear/mitochondrial genome alteration in single stem cell

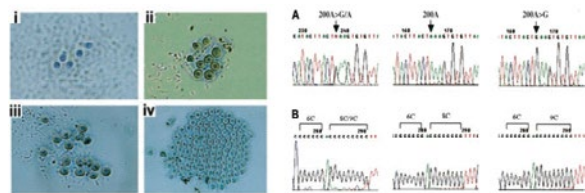
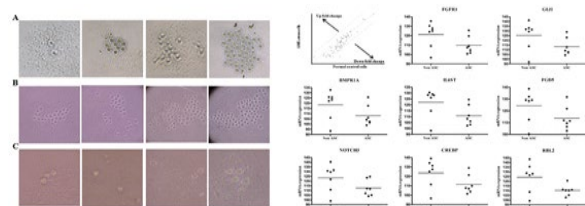
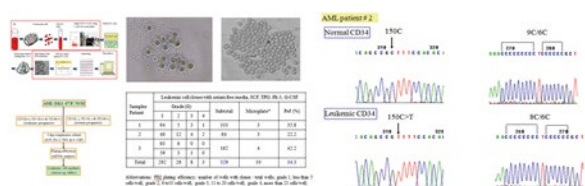


그림 6. 소골수기세포 단일세포 배양 플랫폼 및 미토콘드리아 유전체분석

2. Identification and single cell culture of leukemia stem cells for their molecular signature and clinicopathological implications at the single leukemia stem cell level



3. Identification of mitochondria biomarkers for hematopoietic stem cell trafficking and molecular diagnostics



Major relevant publications

1. Mitochondrial DNA minisatellites as new markers for the quantitative determination of hematopoietic chimerism after allogeneic stem cell transplantation. *Leukemia* 2007;21:369-73
2. High-frequency minisatellite instability of the mitochondrial genome in colorectal cancer tissue associated with clinicopathological values. *Int J Cancer* 2012;131:1332-41
3. The prognostic impact of mutations in spliceosomal genes for myelodysplastic syndrome patients without ring sideroblasts. *BMC Cancer* 2015 Jun 27;15:484.(corresponding)
4. Direct confirmation of quiescence of CD34+CD38-leukemia stem cell populations using single cell culture, their molecular signature and clinicopathological implications. *BMC Cancer* 2015 Apr 2;15:217.
5. Coexistence of *JAK2* and *CALR* mutations and their clinical implications in patients with essential thrombocythemia. *Oncotarget* 2016;7(35) epub

Research networks

More than 5 international research centers including Hematology Branch, NHLBI, NIH