Cell-context dependent functions of mTOR complexes in leukemia

Takayuki Hoshii

Division of Molecular Genetics, Cancer Research Institute,
Kanazawa University,
Kakuma-machi, Kanazawa 920-1192, Japan

Mammalian target of rapamycin (mTOR) is an evolutionarily conserved serine/threonine kinase in eukaryotes that plays a critical role in cell growth and metabolism. mTOR forms two different complexes, mTORC1 and mTORC2, and phosphorylates multiple substrates by responding growth factors and nutrients. In hematopoiesis, mTORC1 dysregulation promotes leukemogenesis and depletes hematopoietic stem cells (HSCs). Although suppression of mTORC1 in HSCs is required for their quiescence and stress-resistance against ROS, effects of mTOR-targeted drugs on leukemia-initiating cells with stem cell properties remains unclear. Recent our studies showed striking evidence that AML stem cells lacking mTORC1 activity can proliferate and survive long-term *in vivo*. In contrast, we found that mTORC1 deficiency in T-ALL model resulted in efficient eradication of leukemia. In this presentation, we will discuss the cell-context dependent roles of mTOR complexes in leukemia and the efficacy of mTOR inhibitors for leukemia therapy.

Reference: Hoshii T et al., *JCI*. 122(6):2114-29, 2012.

EDUCATIONS AND POSITIONS

1998-2002	B.E., Developmental engineering, Kinki University, Japan
2002-2004	Master's degree in medical science, Kumamoto University, Japan
2004-2007	Ph.D., Life Science, Kanazawa University, Japan
2007-2010	Post-doctoral Fellow, Cancer Research Institute, Kanazawa University, Japan
2010-Present	Assistant Professor, Cancer Research Institute, Kanazawa University, Japan