Personal Information			
First Name	Jae-Seon	**Last Name**	Lee
Organization	Inha University College of Medicine	**Position**	Professor
Field of Expertise	Cancer cell senescence		
Title of Presentation	Understanding of therapy-induced premature senescence in tumor microenvironment		

Abstract

Cellular senescence was originally characterized as a state of indefinite growth arrest. Because senescence keeps cells from dividing, it can limit proliferation potential of cancer cells. When we began to study ionizing radiation (IR)-induced cancer cell senescence, we firstly tried to understand the characteristics of IR-induced cancer cell senescence. It has been also found that senescence is engaged in tissue remodeling, immune response, and wound healing through the senescence-associated senescence phenotype (SASP). It means that cellular senescence is a double-edged sword in tumor microenvironment (TME). Since complex biological interactions between the tumor and stromal cells have to be considered for the success of radiotherapy, we are trying to understand the effects of radiotherapy on senescence of cancer cells and endothelial cells. In this presentation, recent our research outcomes in ionizing radiation (IR)-induced cancer cell senescence and endothelial cell senescence will be presented. We found that activated specific activation of integrin α6β4-AKT signaling induces premature senescence, instead of apoptosis, in irradiated cancer cells. We also found that PTEN depletion induces cellular senescence via mTOR kinase. In the absence of PTEN, mTORC1/C2 directly binds p53 and phosphorylates it at serine 15. mTORC1 and mTORC2 compete with MDM2 and increase the stability of p53 to induce cellular senescence via accumulation of the cell cycle inhibitor, p21. These results collectively demonstrate that AKT plays a critical role in switching cells from either apoptotic or proliferative signals to senescence signal via a direct link between the growth-promoting activity of AKT and the growth-suppressing/apoptotic activity of p53. We believe that efforts for the better understanding of IR-mediated senescence of cancer cells and endothelial cells will improve the development of promising strategies for radiotherapy.

Biosketch

[Education & Employment]

1981~1985	Department of Biology, Korea University, Korea	B.S. degree
1985~1987	Department of Biology, Korea University, Korea	M.S. degree
1987~1992	Department of Biology, Korea University, Korea	Ph.D. degree
1993~1994	University of Wisconsin at Madison, USA	Postdoctoral fellow
1997~2004	Seoul Nat'l University College of Medicine, Korea	Senior Researcher
2005~2013	Korea Institute of Radiological & Medical Sciences, Korea	Principal Investigator
2014~Present	College of Medicine, INHA University	Professor

[Representative publications in recent 5 years]

- Lee HC, Kang D, Han N, Lee Y, Hwang HJ, Lee SB, You JS, Min BS, Park HJ, Ko YG, Gorospe M, Lee JS. A novel long noncoding RNA linc-ASEN represses cellular senescence through multileveled reduction of p21 expression. Cell Death & Differentiation. 2020, 27:1844-1861
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