

CURRICULUM VITAE

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1995 M.D Kanazawa University School of Medicine, Kanazawa, Japan

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2002 Research Associate, Dana-Farber Cancer Institute

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Functional role of telomerase in normal human cells

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While maintaining telomere length is one critical function of telomerase, recent evidence indicates that this reverse transcriptase performs other equally important role(s) in malignant transformation and in regulating replicative lifespan. The majority of cancer cells constitutively express telomerase, maintain stable telomere length and are immortal. In contrast, in normal human cells, telomeres shorten with successive rounds of cell division, and immortalization correlates with stabilization of telomere length. These observations suggest that human cancer cells achieve immortalization, in large part, through the illegitimate activation of telomerase expression. However, we have found that the catalytic subunit of the human telomerase reverse transcriptase (hTERT), is expressed during S-phase in normal human cells, previously believed to be devoid of telomerase activity, and that this low-level expression of telomerase maintains telomere structure and controls proliferative lifespan¹. These observations support the view that telomerase plays critical roles in regulating cell physiology in normal human cells beyond maintaining overall telomere length. We have been studying these newly discovered properties of telomerase to understand further the role of telomerase in normal cells. Specifically, we have investigated the effects of telomerase expression on chromosome stability and the response to DNA damage.

1. Masutomi, K. et al. Telomerase maintains telomere structure in normal human cells. *Cell* 114, 241-53 (2003).