

# Clonal evolution from normal cells to cancer



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## ***Abstract***

Cancer is a clonal disorder derived from a single ancestor cell. However, the presence of a clone does not necessarily mean cancer. On the contrary, it has become clear that expansion of positively selected clones in physiologically normal or non-cancerous tissues is commonly seen in association with aging and in response to environmental insults and chronic inflammation. Recent studies have reported expansion of driver-mutated clones in various tissues, where the expansion could be so extensive to remodel almost entire tissues. A conspicuous overlap between driver genes in cancer and normal tissues suggests a strong link to cancer development, providing an important clue to understanding early carcinogenic processes.

Nevertheless, the presence of drivers that are unique to either cancer or normal tissues indicates that these clones may not necessarily be destined for cancer, but even negatively selected for carcinogenesis depending on the mutated drivers. In this presentation, I will introduce clonal expansion in the non-cancer epithelium and discuss its biological significance and clinical application.

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## ***Biography***

He graduated from Kyoto University Faculty of Medicine in 2007. While working as a gastroenterologist, he became aware of the limitations in cancer care. In 2014, he began research at Kyoto University Graduate School of Medicine (Department of Gastroenterology and Department of Pathology and Tumor Biology). Through studies delving into the origins of cancer, he discovered the various evolutions cells undergo within the body. Since 2021, he has been independent in his current position as Program-Specific Associate Professor at the Hakubi Center, Kyoto University. His research focuses on clonal evolution across various organs.