Cover legend: **Yasuhiro Furuichi;** a member of The Editorial Academy of The International Journal of Oncology

Dr Yasuhiro Furuichi made an important fundamental discovery of mRNA m7G-cap structure (Furuichi Y, Proc Jpn Acad Ser B 91: 394-408, 2015). In 1973, at the National Institute of Genetics in Japan, he first observed that mRNA synthesis of insect virus (CPV) that infects silkworm was stimulated *in vitro* by methyl donor *S-adenosylmethionine* and the resulting mRNAs were methylated at the 5'-termini. Based on these unique findings, Dr Furuichi proposed the hypothesis '*Methylation-coupled transcription theory*' (Furuichi Y, Nucleic Acids Res 1: 809-822, 1974), which was later proven true, as the eukaryotic transcriptome was found to consist of RNA polymerase and methyl transferase, and the resulting mRNAs were methylated. In 1975, he identified the 5'-structure of m7GpppAm in CPV mRNA (Furuichi Y and Miura K, Nature 253: 374-375, 1975), and m7GpppGm in human reovirus mRNA (Furuichi Y, *et al*, Proc Natl Acad Sci USA 72: 362-366, 1975), and after he joined Dr Aaron J. Shatkin's laboratory at Roche Institute of Molecular Biology in USA, he discovered the same structures in eukaryotic cell and viral mRNAs, as well as their precursor RNAs in the nucleus (Furuichi Y, *et al*, Proc Natl Acad Sci USA 72: 1904-1908, 1975). He gave such a blocked and methylated structure the nickname CAP. After he confirmed the ubiquitous existence of cap in eukaryotic mRNAs, he elucidated the enzymatic pathway of cap synthesis in reovirus transcription which turned out identical to the cellular mRNA cap synthesis (Furuichi Y, *et al*, J Biol Chem 251: 5043-5053, 1976). Furthermore, in 1977, he and his colleagues demonstrated that the role of cap is essential for stabilizing mRNAs by protecting them from degradation by a 5'-3' exonuclease and for facilitating mRNA translation by binding to the initiation factor eIF4E in the protein synthesis (Furuichi Y, *et al*, Nature 266: 235-239, 1977). These essential frameworks established by Dr Furuichi in the 1970s have supported the understanding of the mRNA capping and translation. The basic contributions made by Dr Furuichi also stimulated drug discoveries, such as the recent anti-influenza virus drug, Xofluza, a cap-dependent-endonuclease inhibitor, by a pharmaceutical company which has thus far saved as many as 5 million of virus-infected individuals in the winter season of 2019. For the virus research community, he served as the associated editor in the Journal of Virology during the term 1980-1985.

After these epoch-making studies in mRNA capping research in the USA, he returned to Japan in 1984 and worked in the Roche drug discovery program. He collaborated with Dr Martin Clozel at Roche in Basel, and formed a Swiss/Japan joint team and found the miracle drug, Bosentan (an endotheline antagonist), which had eased the suffering and pain of many patients with pulmonary hypertension (Breu V, *et al*, Eur J Biochem 231: 266-270, 1995). In 1993, being asked by a sector of the Japanese government, Dr Furuichi began a research consortium at AGENE research institute and challenged an innovative positional cloning to identify the genes whose mutations cause premature aging syndromes. During his seven years at AGENE, Dr Furuichi and his team elucidated that the RecQ DNA helicase family consists of five independent helicases, RecQ1, WRN, BLM, RTS and RecQ5, and they are involved in various DNA repair processes to play an important role in stabilization of human genome in a tissue-dependent and in an enzyme function-dependent manner. These works were published in approximately 100 publications and greatly contributed to the understanding of the importance of DNA repair in human aging and the development of cancers (Shimamoto A, *et al*, Int J Clin Oncol 9: 288-298, 2004).

Thus, Dr Furuichi is an excellent discovery hunter in the basic research field of biology, in which he also contributed to the applied science for the discovery of innovative medicines, such as Bosentan and Xofluza. Currently, in spite of his great age, he has been challenging the development of innovative anti-cancer siRNA drugs (Futami K and Furuichi Y, Front Genetics, doi:10.3389/fgene, 2015). Apart from these known research activities, he has been serving as an excellent mentor to encourage many young scientists worldwide in the public Research Programs.