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Development of a high-efficiency anti-cancer fusion vaccine protein production system using Chinese cabbage**Do-Sun Kim, Jong-Pil Hong, Chaeyeon Lim, Hye-Eun Lee, Eun Su Lee and Jinhee Kim**

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The edible vaccine derived from crop is easy to achieve safety and its price is cheap because of the mass production by agriculture system. To acquire edible vaccine fusion protein for colorectal cancer which is a serious disease in worldwide, we used various form of immunoglobulin Fc (IgM and IgA) and J chain. The J chain is expected to induce a fusion protein complex when co-expressed with other immunoglobulins. The Chinese cabbage (*Brassica rapa*), which is a vegetable, oilseed and fodder crop, grown especially in Asia and Europe, was selected to develop edible vaccine due to the high protein expression rate. The *Agrobacterium* transformation method was used to express each protein in the Chinese cabbage. The T0 transformants were acquired successfully. The three transgene (J-chain, EpCAM-IgM and EpCAM-IgA) was confirmed by PCR using gene specific primers. The transformation efficiency was approximately 3%. The crude proteins from T0 plants were extracted and the over-expressed proteins were detected by Western blot analysis. The over-expression of EpCAM-IgM and IgA were confirmed. T1 plants were also selected by hygromycin and its transgene expression was confirmed by immunoblot assay. We tried to develop vaccine fusion protein complex in Chinese cabbage by crossing T1 plants expressing J chain and immunoglobulin protein each. Chinese cabbage T1 plants each expressing EpCAM-IgM and IgA were crossed with the T1 plants expressing J chain. The F1 hybrid plants were acquired and its fusion proteins were confirmed. The fusion proteins were extracted and their expression levels in Chinese cabbage were estimated. The plants generated by this procedure will provide an efficient edible vaccine tool to prevent cancer disease in the near future.

Biography

Do-Sun Kim has her expertise in plant transformation and tissue culture in introducing useful traits. She is working at National Institute Horticultural and Herbal Science in South Korea. Also, she is In-Charge of Chief of Vegetable Molecular Breeding Laboratory at the Institute and is active as expert Member at Korean Society for Plant Biotechnology.

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