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Editorial Article

Toward Anti-Aging and Long Life

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People are looking for materials effective for anti-aging and long life for many years. Average life in Japan : male is 80.50 (third), female is 86.83 (top in the world). I wonder why Japanese live longer than other country. I believe that Japanese food based on fish is fit and good for long life. I found that disaccharides and hyaluronic acid, glucosamine and chondroitin are closely related with anti-aging and long life.

Hyaluronic acid, glucosamine, chondroitin are now used as health food by many persons in Japan. Suntory sold 20 millions bottles of glucosamine and chondroitin as nutrition supporting food. Setagaya shizenshokuhin sold 22 million bags of glucosamin , hyaluronic acid and chondroitin as health food for 11 years. Taishoseiyaku are selling glucosamine and chondroitin. Zeria Shinyaku is selling chondroitin as medicine for 60 years. Wada calcium pharmaceutical sold 10 million bags containing glucosamin, chondroitin sulfate and collagen as nutrition supporting food. About 6 million persons are drinking and eating these materials and enjoying health, anti-aging and long life. I found the reason why glucosamine, hyaluronic acid and chondroitin are so much used.

Nabeshima found Klotho (anti-aging gene) The mouse carrying this ant-aging gene can live 30% longer. Klotho give Ca homeostasis of body liquid for health and consequent anti-aging and long life. Nabeshima found a sulfo disaccharide from mouse liver cell. I found that the disaccharides are sulfo-glucuronosyl (1-3) glucoside and sulfo-glucuronosyl (1-3) galactoside. I called these disaccharide as anti-aging reagents.

Hyaluronic acid is poly(glucuronosyl (1-3) glucoside-poltmer, alternative co-polymer of glucuronic acid and glucosamine. Chondroitin is poly(glucuronosyl (1-3) galactoside), alternative co-polymer of glucuronic acid and galactosamine. Depolymerization of hyaluronic acid gives glucuronosyl (1-3) glucoside. Depolymerization of chondroitin gives glucuronosyl (1-3) galactoside.

Klotho co-works with produced disaccharide on site and contribute to Ca homeostasis and subsequent health and anti-aging.

Chondroitin and hyaluronic acid are precursor of sulfo disaccharide.

Hyaluronic acid was isolated from eye ball of cow in 1934. For good health, anti-aging and long life, eating of food containing hyaluronic acid and chondroitin is essential. Eating of fish, whole body or head of fish or eye of fish, Nebaneba (stringy and sticky) food like nattou (fermented soybean), sea tangle, kelp, mozuku, yam and cartilaginous tissues of fish, cow, pig, chicken are recommended.

For the supply of glucosamine, shrimp and crab are good food. Then enough hyaluronic acid, chondroitin, glucosamine and Calcium are supplied and Ca^{2+} homeostasis is maintained and anti-aging, long life will be obtained.

Most chondroitin appears to be made from extracts of cartilaginous cow and pig tissues (cow trachea and pig ear and nose), but other sources such as shark, fish, and bird cartilage are also used.

For good health, anti-aging and long life, eat food containing glucosamine, hyaluronic acid, chondroitin, in other word, eat fish, cartilaginous tissues.