

Symposium 1

SY1-1

Cancer Prevention in North East Asia
Breast cancer prevention by soy isoflavones

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In Asia, people are moving away from rural areas into urban agglomerations. Cancer and other chronic diseases follow urbanization. Major changes in disease patterns are reported in developing countries. Reporting in 1997, the World Health Organization (WHO) estimated an increase in the global incidence of cancer from 10.3 million cases in 1996 to 14.7 million in 2020. Breast cancer is still less among Asians than Caucasian, but it steadily increases in Asian countries.

Non-nutrient food chemicals (factors) are recently noticed due to various pharmacological activities in the human body. Antioxidant property of flavonoids, such as quercetin and kaempferol, is considered to be attributable to the low risk of coronary heart disease. Japanese consume a lot of soy bean products containing phytoestrogens, such as daidzein and genistein, which may lead to the low incidence of estrogen-related cancers. More than 600 food factors in vegetables are considered to influence the various metabolic stages in the body.

Antioxidant effects of isoflavonoid rich soya-hypocotyl tea were shown to lower hydroperoxides in the tissues with resultant low 8ohdG, which is a biomarker of DNA damage. Animal experiment coincided well with our hypothesis. Combination of soy hypocotyls and matured garlic powder suppressed nearly 80% of PHIP induced rat mammary cancer.

The high consumption of isoflavones by Japanese would be one of factors to contribute to the longest life expectancy among the world. Similar pharmacological activity is expected in soyabean derived food like tempee in Indonesia.

National programs should design to protect both public health and economic stability and sustainability, using appropriate agriculture and food policies, combining the benefits of traditional diets and lifestyles with the benefits of current science and technology.

SY1-2

Anti-Cancer Activity and Functional Food Factors:
To Stop Endless Proliferation and Spreading of
Cancer Cells.

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Aim: Endless proliferation and the ability to metastasize are phenomena specific to cancer cells, with invasion as an important, characteristic process. The inhibition of the above two biological properties by food components may prolong the life span of the affected host. We tried to screen such components with anti-proliferative and/or anti-invasive activities from foods consumed everyday in Japan, using *in vitro* and *ex vivo* assay systems. Modes of actions of effective food components were also studied.

Methods: The effect on the proliferation of hepatoma cells, AH109A, was assayed by either the WST-1 method or the [³H]thymidine incorporation method, while the effect on the invasion of the hepatoma cells was evaluated by co-culturing AH109A cells with mesentery-derived mesothelial cells (M cells). To learn bioavailability of effective components *in vivo*, rats were given oral intubation; blood was obtained, and serum prepared from blood was subjected to the above-mentioned assay systems (*ex vivo* assay).

Results: Carotenoids from vegetables and crustaceans, curcumin from turmeric, chlorogenic acid and its constituents from coffee suppressed the invasion of hepatoma cells. Resveratrol from grape and catechins from tea suppressed both the proliferation and invasion of AH109A cells, although resveratrol-treated rat serum failed to suppress the hepatoma proliferation. The fluorescence staining of the nuclei, electrophoresis detection of DNA fragmentation, and analysis of cell cycle indicated that sera from tea-treated rats, tea extracts and related tea components resulted in loss of viability, apoptosis, and cell cycle arrest at the G₁ phase in AH109A, but did not in normal M cells. Powdered green tea feeding suppressed the growth of solid tumor in hepatoma-bearing rats. Reactive oxygen species (ROS) enhanced the invasive activity. All the components mentioned above suppressed the ROS-potentiated invasive capacity. Since gene expression and activity of scatter factor (SF) in hepatoma cells was stimulated by ROS treatment, these food components might cancel the SF expression through their ROS-scavenging activity.

Conclusion: Induction of apoptosis and cell cycle arrest may be important mechanisms of *in vivo* inhibition of the AH109A proliferation. The antioxidative property of these food factors may be involved in their anti-invasive action.

SY1-3**Studies on the relationship between changes in dietary patterns and health Status****Zhao Faji MD, Guo Junshing MD****Department of Public Health ,Second Military Medical University, Shanghai China**

Aim: Study the relationship between dietary patterns and health and disease.

Methods: We investigated retrospectively the changes in dietary composition, health status and mortality from disease of the Shanghai population from 1950s to 1990s. The data of changes in the dietary patterns were taken from the Yearbook of Shanghai Statistics. About health and disease were taken from materials published by Shanghai Statistics Bureau and Shanghai Public Health Bureau.

Results: The results showed that remarkable changes had occurred in the dietary composition, health status and disease mortality. The energy from grain products decreased and from animal foods increased. From the 1950s to 1980s and 1990s the energy from fat was increased from 15% to 25% and 30%, the energy from carbohydrates was lowered from 70%~75% to 65 and 60. As a result of the changes of diet, the health status and disease mortality also changed. For example, the average height in males of 18~20 years old was increased, and the average life span was increased. At same time, the rank order of mortality causes also changed. Before 1950s the first three diseases were measles, tuberculosis and senility, but in 1980s and 1990s they were malignant tumors, cerebrovascular disease, and ischemic heart disease. There was a significant positive correlation ($p < 0.01$) between consumption of saturated fatty acids and malignant tumors, heart disease and cerebrovascular disease.

Conclusions: The causes of these changes may be the changes of dietary composition and nutritional composition of diet, although there are other factors. Therefore it is imperative to change the dietary composition.

SY1-4**Prevention of Cancer**

Focused on nutrients and dietary consumption of Korean and western industrialized country to compare the cancer incident rates.

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Cancer is the most important human agony among health problems these days. Despite various cell molecular level of research including epidemiological studies for identification of factors for cancer development are carrying globally, causes of cancer incidence have not been explicit.

In this presentation, I am going to concentrate on nutrients and dietary consumption between Korean and American trying to draw the explicit causal factors for cancer incident rates.

In general, 38-40% of total energy consumption comes from lipid in American diet and 18-20% in Korean. On the contrary, 55-65% of total energy consumption occupies by Carbohydrates in Korean diet and 35-40% in Americans. These are the major differences in diet composition between two countries.

According to the WHO year 2,000 world Health Statistics Annual among three countries, Korea, Japan and U.S.A., total mortal death rate from Malignant Neoplasm in Korea is the lowest.

It has recommended various plant foods with weak scientific proofs for cancer treatment and alleviation of cancer patients in different degrees. These are as follows; garlic, onion, tomato, green leafy vegetables, lycopene containing fruits, fiber containing foods, phytochemical containing foods as well as milk.

In conclusion, it has well known and well practiced to decrease consumption of animal origin foods and increase plant origin foods to prevent degenerative diseases and malignant neoplasms. These days, research trends have shown that specific foods for specific region of cancer in the body are recommended for cancer treatment and prevention.