

## 2<sup>nd</sup> World Congress on **Breast Cancer**

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### Acidosis-dependent anti-cancer chemotherapeutics

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It is well known that solid cancer nests are acidified. The external acidosis induces the decrease in cytosolic pH, which may affect functions of target molecules of anti-cancer drugs, but the effect of acidosis on the efficacy of anti-cancer drugs has not been focused. We examined anti-proliferation activity of approximately 280 chemicals under acidic conditions, and found that 4 compounds, lovastatin, cantharidin, manumycin A, and ionomycin, inhibited cancer cell proliferation preferentially at acidic pH. At a clinical level, statins were reported to suppress tumor progression including breast cancer, but the development of statins as an anti-cancer drug is still behind because clinical investigations to suggest negative effects of statins have been also reported. Our results revealed that statins inhibit cancer cell proliferation at acidic pH and no significant inhibition is observed at alkaline pH around 7.4. The efficacy of statins is, therefore, argued to be low at the early stage of cancer development and/or in small cancer nests where acidosis is not enough, and this may be the reason for the negative effect in some clinical investigations. Despite this limitation, statins are superior because of less effect on normal tissues, especially on immune systems in the body. In fact, statins are now prescribed as an anti-hyperlipidemia medication, and no serious side effects, such as dysfunction of immune system, pain, diarrhea, nausea, and hair loss, have been reported. We found many genes whose expression was induced under acidic conditions, suggesting the possibility to acquire other acidosis-dependent drugs using our protocol in future. Chemotherapy with such drugs may reduce a mortality of breast cancer patients, in association with amelioration of the serious side effects observed in current anti-cancer chemotherapy.

### Biography

Hiroshi Kobayashi received his PhD in Biochemistry from University of Tokyo in 1974. After his Post-doctoral training at Colorado University Medical Center, he started to study adaptation strategies of microorganisms to acidic environments at Chiba University in 1978. His research is focused on mammalian cell functions under acidic conditions from 1996 at Graduate School of Pharmaceutical Sciences, Chiba University. He retired in March 2012 and is a Professor Emeritus at Chiba University after his retirement. He works as an Associate Editor of International Immunopharmacology published by Elsevier B V from 2014.

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