



Prof. Michael Nobel Symposium

**Development of the Medical Engineering and Nursing Platform:
Fulfilling the Promise of Personalized Medicine
in Cancer Therapy**

Shizuoka Cancer Center Hospital and Research Institute, Japan
September 24, 2008



Organizing Committee:

Chair: Toshihisa Ishikawa (Professor, Grad. School Biosci. & Biotech., Tokyo Institute of Technology)
Ken Yamaguchi (President, Shizuoka Cancer Center Hospital and Research Center)
Ichiro Okura (Vice President, Tokyo Institute of Technology)
Shigehisa Hirose (Dean, Grad. School Biosci. & Biotech., Tokyo Institute of Technology)
Tatsuo Omachi (Director, Frontier Research Center, Tokyo Institute of Technology)
Tohru Mochizuki (Vice-Director, Shizuoka Cancer Center Hospital and Research Institute)
Kyoji Kunitomo (Institute of Integration Research, Tokyo Institute of echnology)

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Dr. Michael Nobel

Dr. Michael Nobel was born in Sweden and has been living in Switzerland for many years. He is a citizen of Sweden and Switzerland, married with two children. After studies in Sweden and America he obtained a doctorate at the University of Lausanne in psycho-pedagogy in 1979. The thesis subject was the evaluation of the effectiveness of substance abuse prevention programs. In the science field he worked for seven years as a researcher in social sciences at the Institute for Mass Communication Research at the Lausanne University and at the Institute of Social and Preventive Medicine in the same city. He has been a consultant to UNESCO in Paris and the United Nation's Social Affairs Division in Geneva.



Commercially he participated in the introduction of magnetic resonance imaging and developed a highly successful diagnostic imaging service company in Sweden. He is today chairman or board member of twelve other international companies. These involve diagnostics, treatment and information in the field of medicine; other areas include satellite communications, Internet service provision, investment banking and management consulting.

In his idealistic work Michael Nobel is chairman or board member of several non-for-profit organizations in the fields of conflict resolution, youth education and development. He is also executive chairman of the Nobel Charitable Trust, which gives awards to politicians, scientists and corporate leaders in the area of renewable energy and organizes conferences in the same field.

Michael Nobel sits on several prominent international prize committees. He has received numerous international citations and awards for his work in the fields of medicine and conflict resolution including an honorary doctorate from Soka University in Tokyo and an honorary professorship from the National Academy of Science of Azerbaijan. He is an honorary member of two Rotary clubs and in 1997 Rotary International conferred on him the Paul Harris Fellowship Award.

In 2002 he was awarded the Gandhi, King, Ikeda Award from Morehouse College in Atlanta, earlier only given once, to Prince El Hassan bin Talal of Jordan. In 2004 he became the Citation Recipient from the Midwest Research Institute of Kansas City. Previous recipients include Margaret Thatcher, Henry Kissinger, Paul Volcker, former chairman of the Federal Reserve Bank, Edward Teller, father of the H-bomb, and Henry Ford.

Also in 2004 he became foreign member of the Russian Academy of Natural Sciences as well as receiving the UNESCO medal for outstanding contributions to the cultural dialogue between nations. The same year, in Jerusalem he received the Albert Einstein Medal for Outstanding Achievements in Life Sciences and Technology and in 2006 the International Order of Perfection, First Class.

In 2007, he was appointed as the Visiting Professor of the Frontier Research Center, Tokyo Institute of Technology that is considered Japan's equivalent of the MIT and Cal Tech in USA.

Scope and Aim

In the 21st century, emerging genomic technologies (i.e., bioinformatics, functional genomics, and pharmacogenomics) are shifting the paradigm of drug discovery research and improving the strategy of medical care for patients. In order to realize personalized medicine, it is critically important to understand the molecular mechanisms underlying inter-individual differences in drug response, namely, pharmacological effects vs. side effects. The occurrence of variations among persons to the drug response may involve many different causes, for example, genetic variations and/or expression levels of drug target molecules, including membrane receptors, nuclear receptors, signal transduction components, enzymes, etc. Observations of inter-individual variations in different drug responses have led to the development of pharmacogenomics research.

Cancer is one of the gene-associated diseases, involving multiple factors in its cause and progression. Despite enormous efforts spent in the development of cancer chemotherapies, often these therapies are effective only in a relatively small proportion of cancer patients. Acquired and intrinsic drug resistance in cancer is the major obstacle to long-term, sustained patient response to chemotherapy. It has been long recognized that the effectiveness of anticancer drugs can vary significantly among individual patients. It is obvious that the susceptibility of cancer cells to particular anticancer drugs cannot be predicted by a single factor but is determined by many factors that influence overall sensitivity. Cancer cells appear to have the capacity to generate variants resistant to anticancer drugs, as part of biological responses to external challenges. Tumors, and even individual cancer cells, can exhibit multiple mechanisms of resistance simultaneously. In order to overcome resistance it may be necessary to achieve a high-rate killing of tumor cells before multiple resistance mechanisms can develop, and/or to develop therapeutics that simultaneously target several resistance mechanisms.

Topics of Lectures

New technologies are emerging to accelerate the speed of genetic testing and to enable the non-invasive molecular imaging for human cancer therapy. This symposium offers an opportunity for new future business alliances as well as the development of the medical-engineering platform.

Clinical evidence conveys important information as to the development of new drugs and therapeutic strategies. It is now known that inherited differences among individuals may also affect drug efficacy and toxicity. Such differences include genetic polymorphisms in drug targets and drug-metabolizing enzymes, as well as in drug transporters. We will discuss current issues regarding the individual difference in drug efficacy and side effects to gain insight into the underlying molecular and genetic mechanisms. Furthermore, we will gain latest information on new technologies for cancer diagnosis and therapy, such as single cell-based screening method for cancer-specific immune cell-related genes, autopilot system for diagnostic imaging, and clinical applications of proton therapy.

Program

September 24 (Wednesday)

11:00-11:20 Meeting with Dr. Ken Yamaguchi, President of Shizuoka Cancer Center

11:20-12:00 Tour in Shizuoka Cancer Center Hospital and Research Institute

12:00-13:30 Lunch with invited speakers and organizing committee members

13:30-13:45 **Opening Remarks**

Ken Yamaguchi (President, Shizuoka Cancer Center Hospital and Research Institute)

13:45-14:30 **Lecture of Prof. Michael Nobel (Nobel Charitable Trust Foundation)**

"The application of hyperthermia in conjunction with radiation and chemotherapy, promises and challenges of an adjuvant treatment method"

14:30-16:00 **Pharmacogenomics in Human Cancer**

Toshihisa Ishikawa (Tokyo Institute of Technology, Japan)

"Pharmacogenomics of multidrug resistance transporters: From basic research to clinical applications"

Yoshihide Hayashizaki (RIKEN Yokohama, Japan)

"The world-fastest SNP detection method and its application for cancer diagnosis"

Akira Nakagawara (Chiba Cancer Center Research Institute)

"Translational genomics and drug discovery to cure cancer patients"

16:00-16:15 Coffee Break

16:15-17:45 **New Approaches in Cancer Diagnosis and Therapy**

Yasuto Akiyama (Shizuoka Cancer Center Research Institute)

"Development of single cell-based screening method for cancer-specific immune cell-related genes"

Masahiro Endo (Shizuoka Cancer Center Hospital)

"Autopilot system for diagnostic imaging – The concept and clinical benefits"

Shigeyuki Murayama (Shizuoka Cancer Center Hospital)

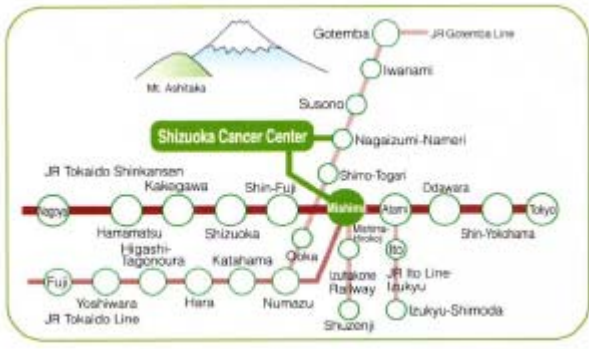
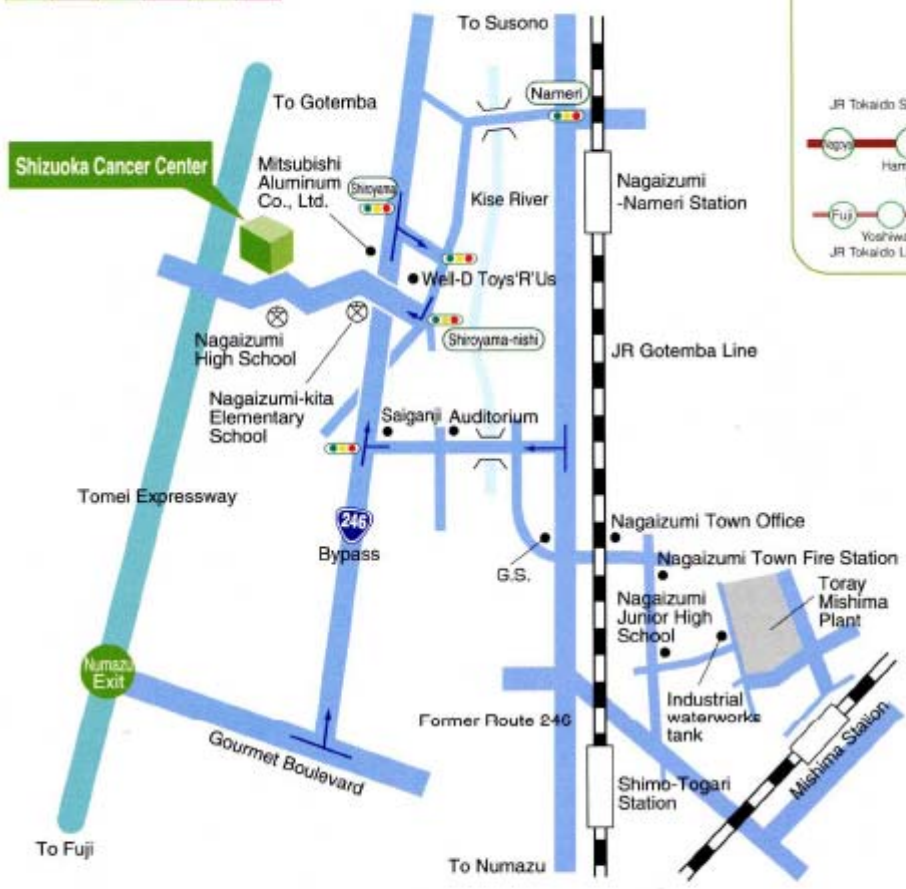
"Clinical application of proton therapy"

17:45-18:00 **Closing Remarks**

Ichiro Okura (Vice-president, Tokyo Institute of Technology)

18:15-20:00 **Dinner** (Prof. Nobel and all participants)

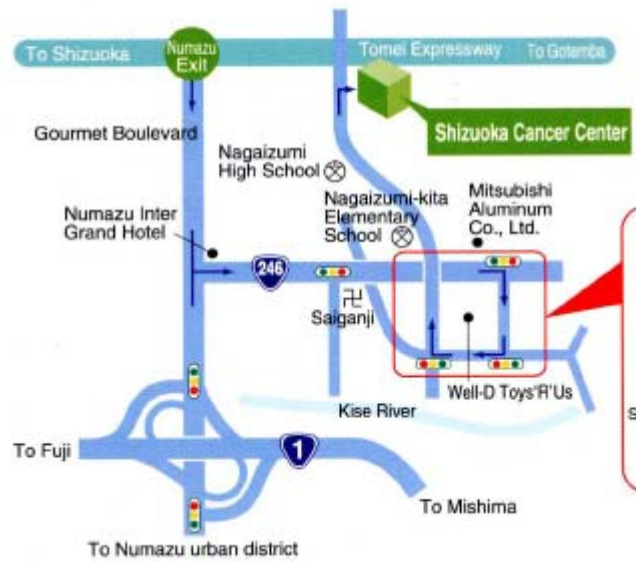
Access



Access by train

- From Mishima Station**
 By taxi: Approximately 20 minutes to the Cancer Center.
 By bus: From Bus Depot No. 3 at the South Exit, take a bus bound for either "Cancer Center" or "Suruga-daira." Get off at the Cancer Center (approximately 30 minutes).
- From Nagaizumi-Nameri Station**
 By taxi: Approximately 5 minutes to the Cancer Center.
 By bus: From Bus Depot No. 1, take a bus bound for either "Cancer Center" or "Suruga-daira." Get off at the Cancer Center (approximately 10 minutes).

Note: For all buses departing either of these two stations, get off at the Cancer Center bus stop, not at the Cancer Center Entrance bus stop.



Access by car

Approximately 7 minutes from the Tomei Expressway Numazu Exit. Turn off the expressway at the Numazu Exit, go straight ahead, then turn left to enter National Highway No. 246 bypass (towards Atsugi and Gotemba). Go straight ahead for about 3 minutes, and turn right at a signal immediately after passing the Well-D Shopping Center on your right. Turn right again at the next signal, and make another right at the next Shiroyama-nishi intersection. Drive uphill, pass in front of the Nagaizumi-kita Elementary School and Nagaizumi High School, then turn right towards the Cancer Center Entrance.

View of Symposium Site



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