Project: IEEE P802.15 Working Group for Wireless Personal Area Networks   (WPANs)

Submission Title: [Introduction of Medical ICT Consortium in Japan and Official Liaison for IEEE802.15 TG6]

Date Submitted: [January, 2009]

Source: [Ryuji Kohno]

Company [National Institute of Information and Communications Technology (NICT) and Yokohama National University]

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Abstract: [This document describe introduction of Medical ICT Consortium in Japan as an official liaison for IEEE802.15 TG6.]

Purpose: [To help discussion in IEEE 802.15.MBAN.]

Introduction of Medical ICT Consortium in Japan and Official Liaison for IEEE802.15 TG6

Ryuji Kohno

National Institute of Information and Communications Technology (NICT),
Yokohama National University

Japanese Government Strategy

- The 3rd Science and Technology Basic Plan in Government (FY2006-FY2010)
  - Promoting R&D of ICT for safe and reliable social infrastructure including medical infrastructure
- Ubiquitous Network "u-Japan Plan" in MIC (FY2006-FY2010)
  - Establishing Ubiquitous Ad-Hoc Network for Medical Service

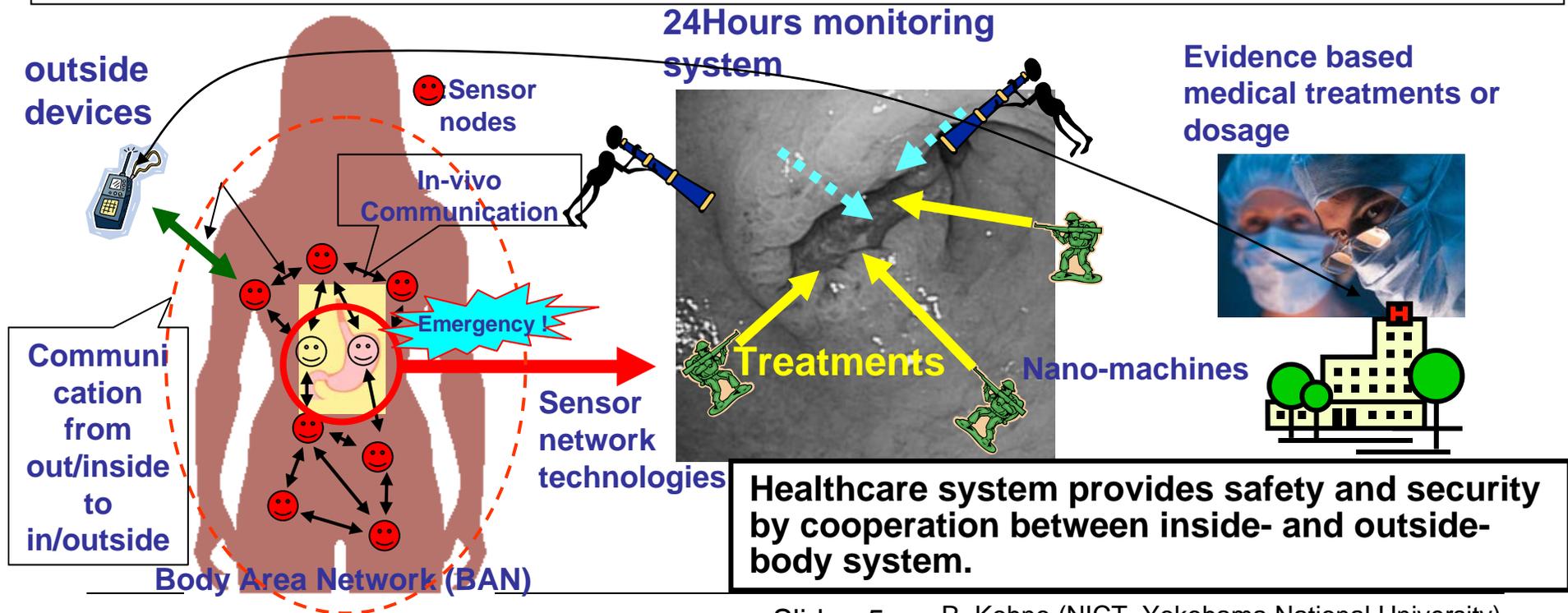# NICT (National Institution of Information Communication Technologies) Medical ICT Project

NICT has researched and developed core technologies for Medical ICT, such as
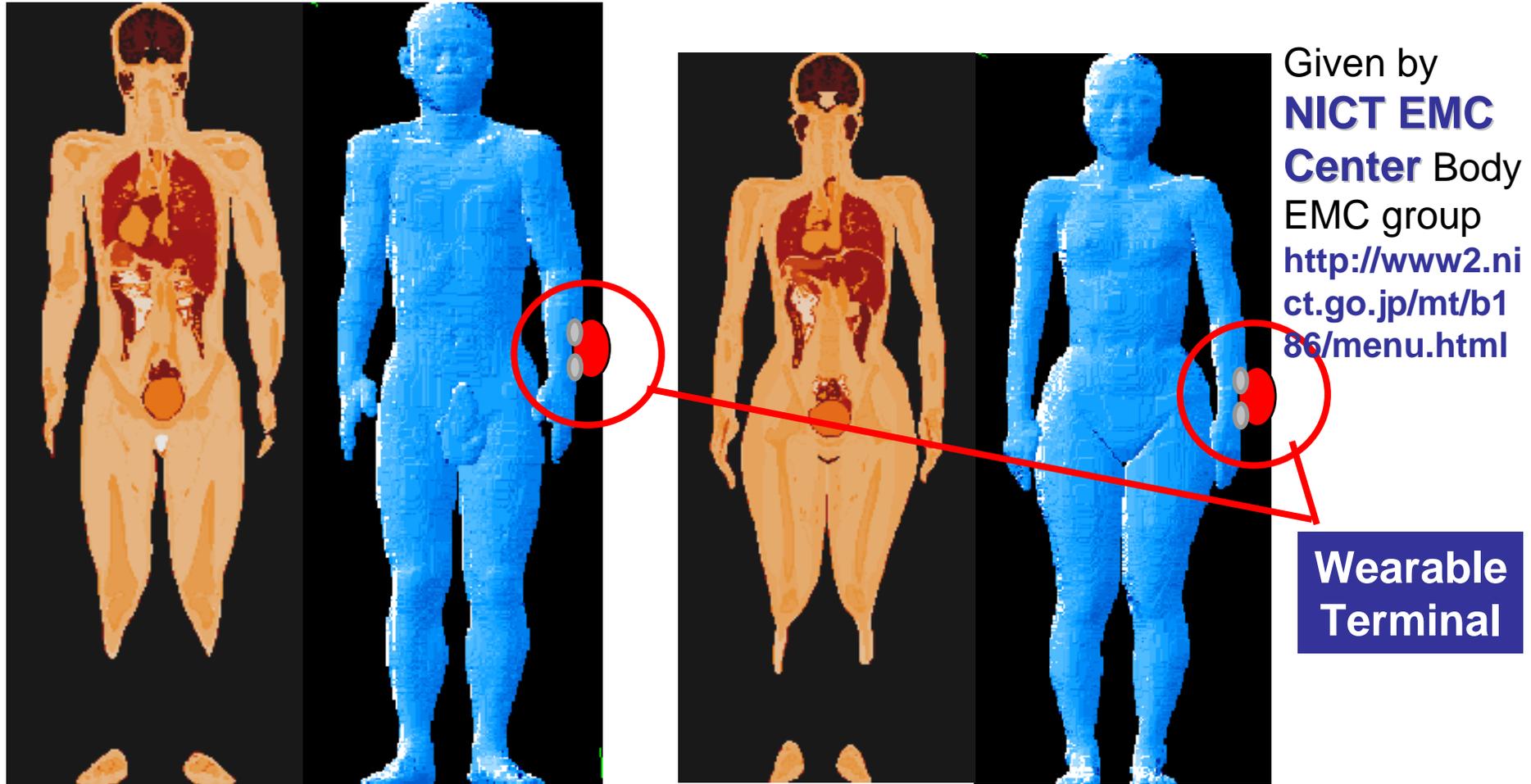
- **Biomedical EMC Measurement**
  - Safety guidelines for human body
- **Ultra-wideband (UWB) Communications and Positioning**
  - low-interference RF signals for medical equipments and human body

R. Kohno (NICT, Yokohama National University)

NICT Medical ICT Project

- **R&D of Medical Healthcare Systems Based on Advanced Wireless Technologies Useful to Support Medical Treatments and Diagnosis, e.g. BAN (Body Area Network)**

- **Making Guidelines for Wireless ICT for Medical Uses, i.e. EMC, SAR**

- **Promotion of Standard for Medical ICT Systems, e.g. BAN, MICS**

24Hours monitoring system

Evidence based medical treatments or dosage

outside devices

Sensor nodes

In-vivo Communication

Communication from out/inside to in/outside

Emergency !

Treatments

Nano-machines

Sensor network technologies

Body Area Network (BAN)

Healthcare system provides safety and security by cooperation between inside- and outside-body system.

EMC Analysis with High-Resolution Whole-Body Voxel Models of Japanese Adult Males and Females

Given by **NICT EMC Center** Body EMC group
http://www2.nict.go.jp/mt/b186/menu.html

Wearable Terminal

*Tomoaki Nagaoka,et al., "Development of Realistic High-Resolution Whole-Body Voxel Models of Japanese Adult Males and Females of Average Height and Weight, and Application of Models to Radio-Frequency Electromagnetic-Field Dosimetry " Physics in Medicine and Biology, Vol.49, pp.1-15, 2004.

NICT Medical ICT Project
and Japanese MICT Consortium

Domestic Activities

Cooperation of R&D

International Activities

Yokosuka Research Park (YRP)

Collaboration

International Conferences ; ISMICT06&07

Digital Healthcare Aliance; **CONTINUA**

MAGNET beyond

MOU

NICT Medical ICT Project

-R&D, Standardization, Regulation, Collaboration-

· MICT Technology Institute

▪ EMC Institute

MOU

MOU

University of Oulu, Finland

Other projects ,e.g. e-Health, tele-medicine, etc

over 20 Major Companies

Universities

Proposal & Contribution

Japanese regulator Regulatory Committee

Japanese MICT Consortium

- Two Major Research Groups
- Four WGs in each Group

International Standard: **IEEE 802/1073/11073**

MMAC's Japanese Standardization

Standardization and Regulation activity

International Regulation: ISO, ITU-R

Medical ICT Consortium

NTT-AT
OKI
OMRON HEALTHCARE
OLYMPUS MEDICAL
SYSTEM
KDDI LAB.
SANGIKYO
COORPERATION
SIEMENS
SHARP
TSUMURA RESEARCH LAB.
TOSHIBA
NIPPON SIGNAL
NETWORK SYSTEMS

Hitachi
FUJI FILM
FUJITSU
FUJITSU COMPONENT
BUSAN TECHSEL ELECTRONICS
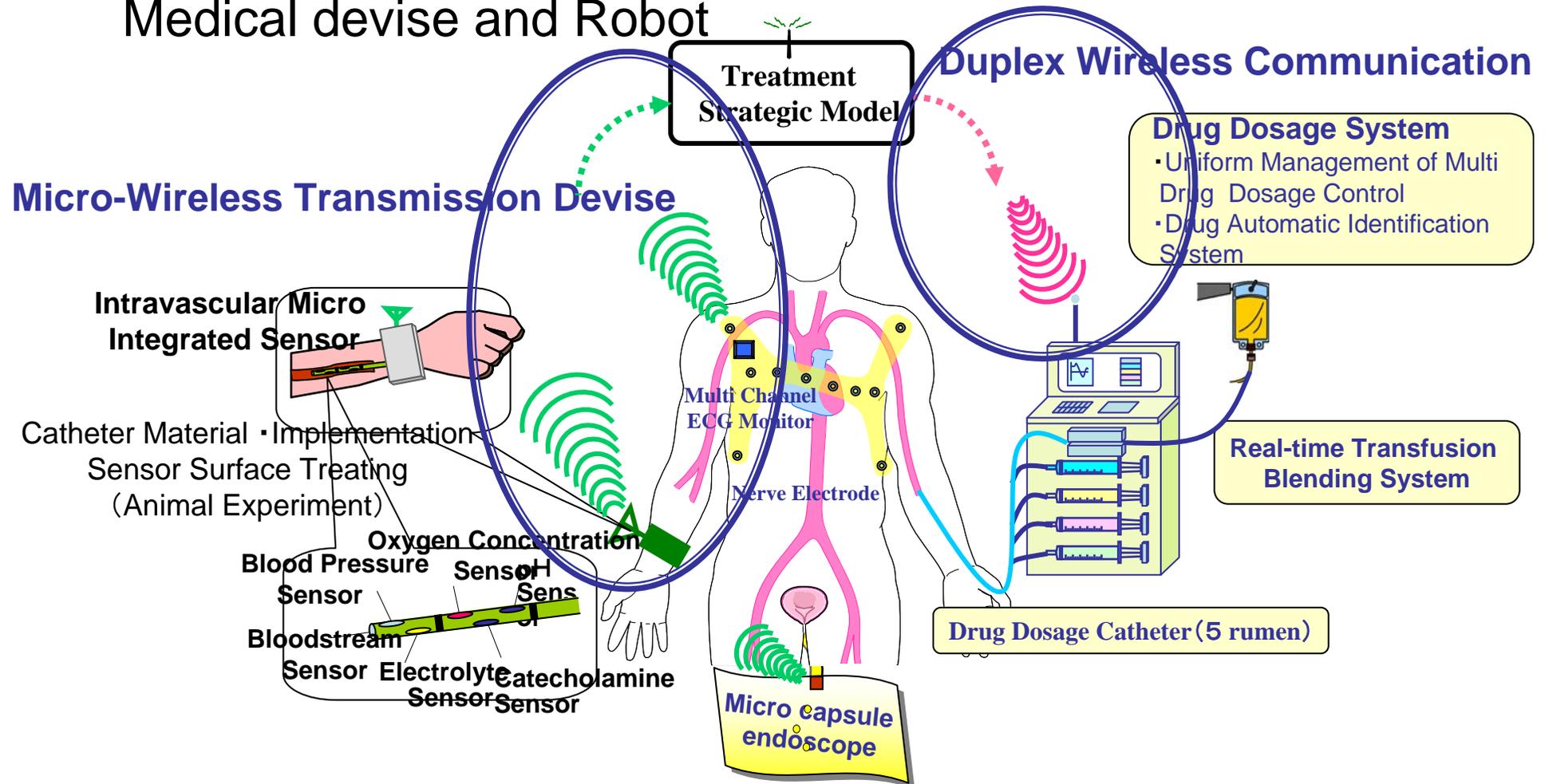PANASONIC (MATSUSITA
ELECTRICAL)
TERUMO
YOKOHAMA NATIONAL UNIVERSITY
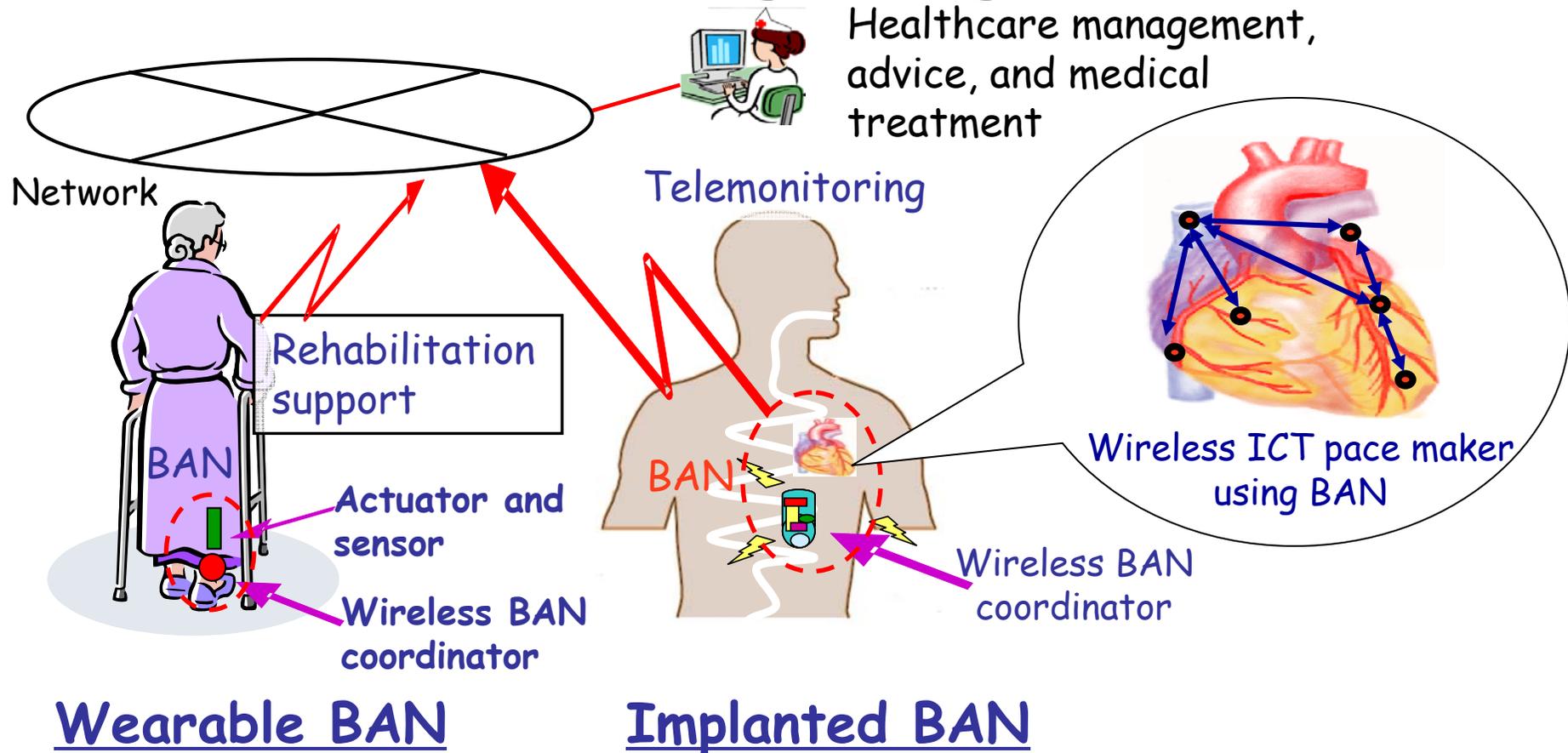YOKOHAMA CITY UNIVERSITY
NICT

Ubiquitous Medicine Based on Networking

Real-time Telemeter Using Satellite Link

UMN (Ubiquitous Medical Network) can perform telemrtering and telecontroling with BAN

NGN

Medical Center (HUB Station)

Mobile Terminal

Real-time Telemeter Using Land Network

VSAT

BAN   **BAN**

Terrestrial Digital TV Broadcasting Network

Terrestrial Mobile Cellular Network

BAN

BAN

切替

Breathing

EEG

BAN **BAN** Ser.

BAM/PAN

WLAN

BAN

Medical Server

ECG

Blood pressure

Carotid pulse

BAN

■ BAN Server ▲ Repeat node ● Sensor node

BAN (Body Area Network) can collect any vital information such as EEG, ECG etc in-vitro and in-vivo with wearable and Implanted sensors. BAN can be connected with other networks such as WLAN, WPAN, mobile phone networks, and satellite Networks for ubiquitous medical healthcare.

Ubiquitous Medical Care System & Network

Tele-metering of Vital Information and Tele-controlling of Medical devise and Robot

Treatment Strategic Model

Duplex Wireless Communication

Micro-Wireless Transmission Devise

Drug Dosage System
・Uniform Management of Multi Drug Dosage Control
・Drug Automatic Identification System

Intravascular Micro Integrated Sensor

Catheter Material ・Implementation Sensor Surface Treating （Animal Experiment）

Multi Channel ECG Monitor

Nerve Electrode

Real-time Transfusion Blending System

Oxygen Concentration Sensor pH Sensor

Blood Pressure Sensor

Bloodstream Sensor **Electrolyte Sensors** **Catecholamine Sensor**

Drug Dosage Catheter（5 rumen）

Micro capsule endoscope

Slide 10   R. Kohno (NICT, Yokohama National University)
Urinary Output ・Electrolyte Monitor

Medical Body Area Network (BAN)

Effective medical treatment is provided by vital information monitoring through wireless BAN.

Healthcare management, advice, and medical treatment

Network

Telemonitoring

Rehabilitation support

BAN

BAN

Actuator and sensor

Wireless BAN coordinator

Wireless BAN coordinator

Wireless ICT pace maker using BAN

Wearable BAN

Implanted BAN

R. Kohno (NICT, Yokohama National University)

Requirements to Realize Ubiquitous Medical Care Using BAN

- To realize ubiquitous medical care using BAN, an advanced wireless ICT is required, which support energy efficiency, robustness against interference, high reliability & Safety for human body and so on.

1. Technology Requirement;
- EMC to protect human body & medical equipments against radio
- Propagation analysis & channel modeling of BAN
- High precision positioning & broadband communication with high reliability
- Highly Secure network to protect privacy of personal vital information

2. Regulation Requirement;
- Guideline to use wireless BAN safely compliant to both FCC and FDA
- New frequency band for medical use

3. Business Requirement;
- International standard to expand a market size
- Sophisticated Business Models

Frequency Regulation for Medical Use

Frequency	ITU	MIC in Japan
608-614 [MHz]	Broadcasting	Broadcasting (TV channel 36)
1395-1400 [MHz]	Radiolocation Fixed (Reg 1) Mobile (Reg 1)	Radiolocation [not used]
1427-1429 [MHz]	Space operation (earth-to-space) Fixed Mobile	Space operation (earth-to-space) [not used]
1429-1432 [MHz]	Fixed Mobile	Mobile uplink (TuKa in TON; Vodafone in others)

EU

Japan

Korea

USA   **Japan**   **USA**   **World wide**

EU

Japan

Korea

USA

402   405   204   429   440   449   608   614   1395 1400   1427   1429.5   3100   5800   10600

MICS ⟵ ————— **WMTS** ————— ⟶   **ISM**   **UWB**   **(MHz)**
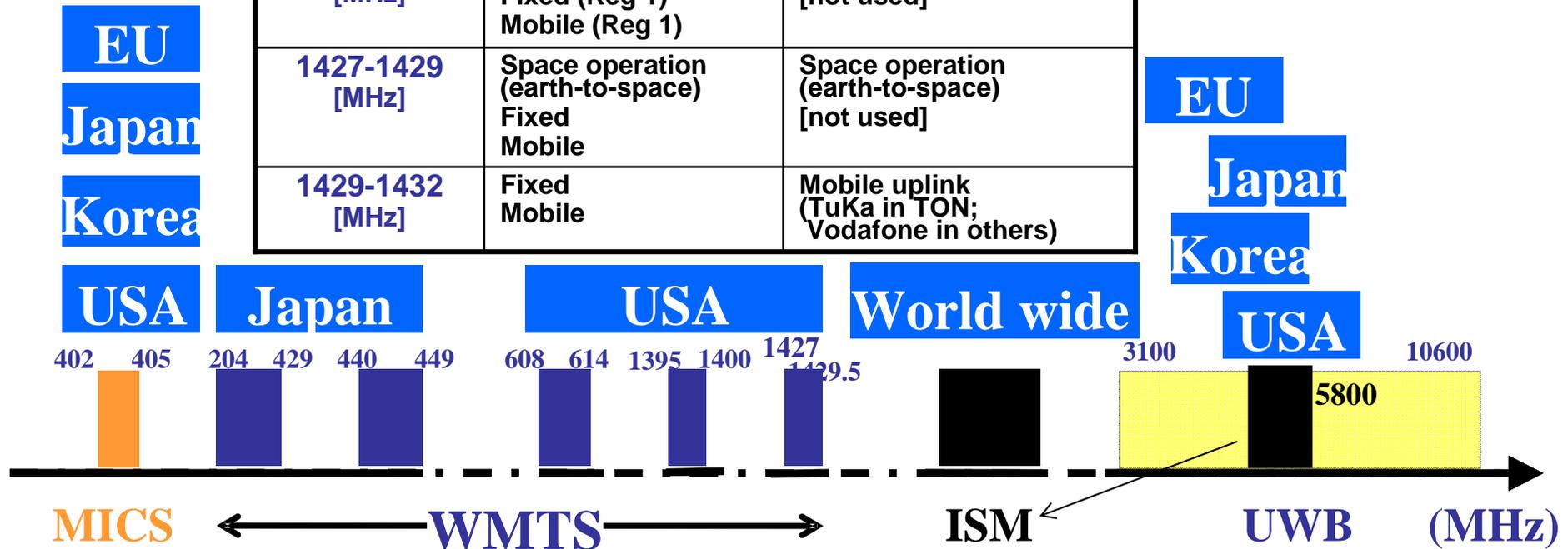
BAND for WMT (Wireless Medical Telemeter) in FCC(USA)
- **608-614 MHz;**   Also for radio astronomy and UHF TV
- **1395-1400 MHz**
- **1427-1432 MHz; Also used for non-medical telemetry**

http://green.ilcc.com/_ismict/

ISMICT 2006

2006 International Symposium on Medical Information and Communications Technology

Hepburn Hall, Yokohama City University, Yokohama, Japan
December 1-2, 2006

FIRST CALL FOR PARTICIPANTS

The 2006 International Symposium on Medical Information and Communications Technology (IS-MICT2006) will be jointly organized by Yokohama National University (YNU), Yokohama City University (YCU), and National Institute of Information and Communications Technology (NICT), and hold at Hepburn Hall in Fukuura Campus, Yokohama City University, Yokohama, Japan, during De-

General Chair:
Ryuji Kohno (YNU)

Co-Chairs:
Shigeo Ohno (YCU)
Yasuo Kokubun (YNU)
Kohei Urano (YNU)
Hiroyo Ogawa (NICT)

Technical Program
Committee Co-Chairs:
Tomio Inoue (YCU)
Jun-ichi Koizumi (YNU)
Hiroyuki Arai (YNU)
Tomoharu Nagao (YNU)
Huan-Bang Li (NICT)

http://www.mict.ynu.ac.jp

ISMICT 07
OULU FINLAND

11-13 December, 2007
University of Oulu, Finland

http://www.ismict2007.org/

FIRST CALL FOR PAPERS

The Second International Symposium on Medical Information and Communication Technology will be organised in Oulu, Finland, from Tuesday 11 December through Thursday 13 December, 2007, consisting of Tutorial and Networking day on 11 December and Symposium on 12-13 December. ISMICT 2007 is a continuation of the first ISMICT event organised in Yokohama, Japan in December 2006. As an answer to the fast growing interest in wireless medical ICT research, the symposium will concentrate on the challenge of achieving ubiquitous and pervasive communications as well as on the process development in healthcare and in welfare environments utilizing wireless solutions.

All the submitted papers need to be connected to the medical ICT context. Possible topics include, but are not limited to:

• Antennas & propagation for WBAN applications
• Cost effects in wireless healthcare or welfare
• eHealth
• Electric medical records
• Hardware architecture and implementation for medical ICT
• Homecare applications
• Hospital data networks
• Medical imaging and patient diagnostic systems
• Prevention and care management ICT networks
• Regulatory issues
• Rehabilitation applications
• Remote patient management
• Smart environments & ubiquitous technologies
• Systems & signal processing
• Telemedicine
• Wireless body area networks
• Wireless healthcare and welfare
• Wireless hospital
• Wireless medical measurements
• Wireless medical sensors

IMPORTANT DEADLINES:
Submission of full papers (max 5 pages): 2 September 2007
Notification of decisions: 5 October 2007
Camera ready copies: 4 November 2007

All accepted papers will be allowed twenty minutes for presentation and be included in the Symposium Proceedings. Instructions for paper authors will be published on the Symposium website in May 2007. University groups, research projects and programmes as well as companies are encouraged to participate in the Exhibition organised during the Symposium. Latest research results and new products and concepts can be introduced in the form of demonstrations or posters. Please contact Prof. Jari Iinatti for further details.

A special networking day and a tutorial day consisting on half day tutorials related to medical ICT context are also being planned for 11 December. Proposals for those are asked to be submitted by 2 September 2007.

Full papers and all proposals are asked to be submitted to cwc-ismict@ee.oulu.fi.

Enquiries regarding paper submissions and general issues should be sent to: Prof. Jari Iinatti, Centre for Wireless Communications, P.O. Box 4500, FI-90014 University of Oulu, Finland Mobile: +358 40 532 9403, Fax: +358 8 553 2845, Email: jari.iinatti@ee.oulu.fi or cwc-ismict@ee.oulu.fi.

SYMPOSIUM LOCATION
The Symposium will be held at the University of Oulu, Oulu, Finland.

SPECIAL ATTRACTIONS
The Symposium venue is located only 2.5 hours train trip from Rovaniemi, the Arctic Circle and Santa Claus Village. Before or after the Symposium You have an excellent opportunity to enjoy the Christmas spirit and meet Santa.

COMMITTEES
Conference General Chair: Prof. Ruyji Kohno, Japan
Conference Technical Chair: Prof. Jari Iinatti, Finland
Conference Technical Co-Chairs: Dr. John Farserotu – Switzerland, Prof. Timo Jämsä – Finland, Prof. Tapio Seppänen – Finland and Dr. Matti Hämäläinen – Finland

Third International Symposium on Medical ICT(ISMICT2009)

Montreal Canada

ISMICT CANADA

WELCOME   CALL FOR PAPERS   CONFERENCE PROGRAM   SPONSORS & EXHIBITIORS   REGISTRATION   GENERAL INFORMATION   CONTACT

FIRST CALL FOR PAPERS

"Emerging wireless information technologies" & "Applications for healthcare" are the central themes for the Third International Symposium on Medical Information and Communication Technologies (ISMICT) to be held in Montreal, Canada, on 24 - 26 February 2009. It will be an international inter-disciplinary effort towards better understanding and predicating how wireless technologies will impact on medical practice.

PRINT

SCOPE

Healthcare is starting to adopt new technologies in wireless medical informatics that promise to overcome current healthcare-delivery limitations being experienced by both patients and physicians. This fast growing interest in technical innovation combined with today's medical knowledge explosion is creating demands on physicians, academics and patients, which require novel and broader paradigms in healthcare where wireless mobility is now expected everywhere.

Topics of interest will include, but are not limited to, the following:

- Cost or benefit considerations in wireless healthcare
- E-Health & citizen centered care
- Hardware architecture for medical & biomedical ICT (Information & Communication Technology)
- Networks for mobile telemedicine & biomedical informatics
- Use of location information in healthcare, including personnel, patient & asset tracking
- Sensing & transmission of vital signs by wireless networks
- Telemedicine, telediagnosis & telesurgery
- Wireless body area networks
- Wireless hospital design & construction
- Wireless-safety/patient-safety as part of hospital certification process
- Wireless security & privacy in healthcare
- Wireless medical & biomedical measurements
- Wireless patient tracking in disaster management

Special Sessions   **Regular Sessions**   **Panels**

PAPER SUBMISSION

Authors are invited to submit full papers (see **www.ismict2009.org**) to the Technical Program Committee no later than September 26, 2008 according to the following schedule: .

September 26, 2008 -Paper submission deadline
November 28, 2008 -Paper acceptance/revision notice
December 12, 2008 -Final paper due

ORGANISATION

Co-Chairs
Bernard Segal PhD. McGill University, Jewish General Hospital, Canada
Jorge Pomalaza Ráez MSc, MUHC, Canada
George Sandor MD. University of Toronto, Canada
Honorary: Arthur Porter MD. Director General & CEO, MUHC, Canada
Technical Program Committee Co-Chairs
Wireless: Ioannis Psaromiligkos, PhD, McGill University, Canada
Clinical: Allen Huang, MD, McGill University, MUHC, Canada

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Dr. John Farserotu, Switzerland
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Prof. Jari Iinatti, Finland
Prof. Carlos Pomalaza Ráez, USA

KEYNOTE & INVITED SPEAKERS

Please check back frequently for news about our insightful and thought-provoking keynote and invited speakers.

ORGANISERS

McGill University Health Centre (MUHC)
Co-Organisers
McGill University
Concordia University
Centre hospitalier de l'Université de Montréal

24-26 Feb., 2009
McGill University, Montreal, Canada

http://www.ismict2009.org/

2009 USA-FDA and YCU Workshop on Clinical Approval

Date; 10:00～17:30   March 4, 2009

Place; Heborn Hall, Yokohama City University

Organization; Yokohama City University, USA-FDA

Program

Opening remarks

Lectures and discussions on Biomarkers

Biomarkers for cell therapy products

Biomarkers for cancer vaccines and cell substrate quality, including an overview of ICH activities

Prognostic biomarkers in various diseases and in transfusion medicine

Biomarkers for vaccines for infectious diseases

Biomarkers relevant to drug efficacy and safety

Genes related to cellular polarity and their involvement in various diseases

Neuronal differentiation of stem cells and regenerative therapy

Other subjects related to biomarkers

Special Lecture on innovative integration between medical and engineering sciences: Ubiquitous medicine based on advanced ICT (Information and Communications Technology)

Closing remarks

2009 Symposium on Medical Information and Communications Technology (SMICT2009)
－Innovation in Medical ICT for the Future Society－
http://www.mict.ynu.ac.jp/smict2009.htm
http://gcoe.mict.ynu.ac.jp/

Date：March 5, 2009 10:00-17:30   **Free of charge for participation**

Venue：Pacifico Yokohama Conference Center, Yokohama, Japan http://www.pacifico.co.jp/english/index.html

Opening (10:00-10:20); Address; Professor Y. Iida, President, YNU

Guests; Representatives of MEXT and MIC, President YCU,, Vice-president NICT, Yokohama City, etc.

Keynote speeches (10:20-12:00)   Prof. Heikki Ruskoaho (U of Oulu), Prof. Yoshio Goshima (YCU), etc.

Lunch (12:00-13:15) Posters and Exhibitions

Presentations and Panels - Global MICT innovations in GCOE project -

(Keynote talk) 13:15-13:40   Prof. R. Kohno, Leader of GCOE project (Director, MICT Center, YNU)

(Part 1) 13:40-15:20 "Innovation in MICT " Coordinator: Prof. N. Yoshikawa, YNU

Presentation and panel discussion by, YNU, YCU, UoO, NICT, and more

(Part 2) 15:40-17:20 "Human resource development for bridging Medicine and Engineering"

Coordinator: Professors Morisihita and Hamagami, YNU

Presentation and panel discussion by; YNU, YCU, Duke Univ., MHLW (Japan), UoO, Industry, Hospital
   Closing 17:25

Conclusion

- Medical ICT Consortium coordinated by NICT with over 20 companies has been introduced as an official liaison of IEEE802.15. TG6.

- Medical ICT Consortium has contributed in R&D, regulatory and standardization of medical ICT systems such as BAN.

- Medical ICT Consortium would like to contribute in any activities to make medical ICT systems including BAN successful in business and social services and to make a new regulation and frequency band for medical ICT systems.