

## KAROLINSKA BME PROFILE

Karolinska University Hospital (Karolinska) is one of the leading university hospitals in Scandinavia and Europe, with a strong commitment to provide quality education and research with focus on best possible patient safety and care. There are 70 departments, comprising of 120 professors, 2100 researchers, 2400 physicians, 1200 biomedical/lab technicians, 5000 nurses and totally about 15.000 employees. Karolinska has over 1.7 million patient visits every year and 8 surgeries per hour are performed every day. Karolinska publish more than 5.000 articles in internationally recognized journals per year, making it one of the leading university hospitals in Europe.

Biomedical Engineering Department at Karolinska (BME) was founded in 1972, and it continues to grow and provide the hospital with leading edge knowledge in the biomedical engineering field. Today the department includes 8 sections with 180 employees; most of them are biomedical engineers. BME services involve today technology management in a system oriented processes that requires understanding how individual devices work in the complete system. The successful use of technologies in healthcare requires well trained staff, both at the clinical work and in the support organisation. The availability of high quality under graduate education, graduate education and continuing education is the prerequisite of providing the healthcare and medical equipment industry with skilled employees.

Sweden is one of the 30 European countries that have been engaged to adopt the educational system according to the Bologna Declaration. In Swedish universities the transition to the new system has been done during the last few years. New Master's Programmes have been started and older programmes have been updated and reconstructed to meet the demands of the Bologna Declaration.

Karolinska and BME together with the Royal Institute of Technology (KTH) and Karolinska Institute (KI) are very much involved in development of new study programmes in the fields of engineering and medicine. For example both of these universities provide wide range of International Master's Programs in English covering different aspects of Medicine, Biomedical Engineering and application of Information and Communication Technologies in medicine. BME at Karolinska plays an important role both in under graduate and graduate courses providing clinical teachers, supervisors and possibilities to work with wide range of modern medical devices. In this context we also develop Quality Assurance system of the educational programmes.

Karolinska and BME participate in a wide range of research projects together with KTH, KI and other universities. We also have developed innovation systems to facilitate product development and commercialization. In several projects we have an industrial partner, which completes the so called triple helix involving academia, public services and industry. A natural consequence of this type of co-operation is the development of active networks both nationally and internationally contributing to the lifelong learning.

Currently, BME's main R&D focus is in telemedicine and eHealth. Karolinska has accomplished several large- scale projects in e-health area and most of them are implemented in the day-to-day work within the hospital and between the hospital and external partners. Majority of those projects were under e-learning framework, education from distance, e.g. in Echo Cardiography, Nuclear medicine Minimal invasive surgery and Telepathology.

During recent years, biomedical engineers from Karolinska have been involved in Swedish International Development Cooperation Agency (SIDA) sponsored projects to strengthen the management and maintenance systems for health care services in Georgia and Albania. The projects were related to education and capacity building within Biomedical Engineering. For instance, new biomedical engineering departments within the national hospitals in these countries were created, and engineers were educated on usage, preventive maintenance and repair of medical equipment.

Karolinska also has established short and long term collaborations together with universities and hospitals in the former Soviet Union, especially the Central Asian region, in order to promote quality assurance of education and research. Together with EU, Sida, the World Bank, and the Asian Development Bank, Karolinska also aims to participate in implementing higher education system development and reform in healthcare institutions of Central Asian countries.