



**BMC | LUND**

GROUNDBREAKING  
MEDICAL RESEARCH

LUND UNIVERSITY | SWEDEN

# WELCOME TO THE BIOMEDICAL CENTRE IN LUND

The Biomedical Centre (BMC) in Lund provides a creative education and research environment for outstanding experimental medical research aimed at clinical application. The newly built BMC, with its modern facilities, is an ideal meeting place for researchers in all areas of medicine. Here, medical students are taught by prominent researchers in a vibrant research environment. The BMC is literally next door to Lund University Hospital, so the distance between hospital clinics and the BMC's laboratories is short, both physically and spiritually.

Not only experts and researchers in medicine meet and work together at the BMC. There is also a great deal of interdisciplinary research combining medicine with engineering and the natural sciences. Research groups from several

faculties of Lund University work together, according to the vision of the Faculty of Medicine, in "breaking new ground to improve quality of life".

The BMC is at the heart of the exciting region of Öresund that comprises southern Sweden and the eastern part of Denmark, one of the most dynamic regions in Europe. Highly specialised health care, biomedical engineering companies and thriving science & research parks are found close to the BMC. Conditions are thus optimal for developing, commercialising and applying the knowledge and ideas born out of research. The development of research findings into commercial products is stimulated by the Bioincubator at the BMC, where newly established biomedical companies are nurtured.





## FACTS & FIGURES

- Lund University's largest centre for education and research, accounting for about 10% of the university's turnover
- Total area of 50 000 m<sup>2</sup>
- Over 100 research groups, half of which carry out clinical research
- Almost 950 researchers, postgraduate students and technical & administrative staff
- About 500 undergraduate students in medicine and biomedicine
- Modern research laboratories covering ~38 000 m<sup>2</sup>, in five buildings, with high-tech equipment and infrastructure, for example, platforms for genomics, proteomics, bioinformatics and bioimaging
- Modern teaching facilities: lecture halls, teaching laboratories, group study rooms
- An incubator for newly started companies, supported by Innovationsbron, Lund University, Ideon Science Park, Region Skåne, Lund Municipality and Sparbanken Finn



"The BMC offers a world class research environment. The research is clearly problem-oriented and the research groups work in thematic mosaics in which development is stimulated by mixing concepts and ideas from different areas. The Bioincubator helps entrepreneurs to bring their ideas to commercial fruition. The BMC is, and will continue to be, an international research centre of the highest quality, which is capable of recruiting and training the very best researchers."



Ingemar Carlstedt,  
Chairman of the Board of the BMC,  
and Professor in mucosal biology

## A CREATIVE ACADEMIC ENVIRONMENT

One of the strengths of the Faculty of Medicine in Lund is its ability to bring together education, patient-oriented research, research into health care and basic research. Much of the faculty's research and education are conducted in close cooperation with the University Hospitals and other units for health care in the county of Skåne. Health care, education and research are the cornerstones of Sweden's university hospitals.

Locating research and education at the Faculty of Medicine of Lund University into three centres: the BMC, the Health Sciences Centre and the Clinical Research Centre (CRC) in Malmö about ten minutes from Lund, creates closely connected environments for basic research, which in turn provide ideal conditions for collaboration between basic experimental research and patient-related research. Physicians and researchers at Lund University Hospital pursue world-leading research together with

researchers at the BMC, as well as other units within Lund University, in areas such as: diseases of the brain, infectious diseases, diseases of the joints, and cancer. At the Health Sciences Centre research and education are directed towards the caring sciences, occupational therapy and physiotherapy. Clinical research, education and health care are collected under one roof at the CRC, at the Malmö University Hospital.

The broad expertise of the staff at Lund University – one of Scandinavia's largest – provides the conditions essential for interdisciplinary research and education. Many successful research environments can be found at the interfaces between medicine, engineering, science and society, which engage postgraduate students and researchers from all parts of the world. Thanks to BMC's strategic location, in the middle of the Öresund Region, many research projects involving other actors in the region are being pursued.





“My research group recently moved into the BMC, and this has been a very positive move. We’re working on both basic molecular processes and clinical research. At the BMC we come into contact with research groups with various interests and areas of expertise. Interesting new ideas come up, not only in the laboratory but during lunch and coffee breaks, so the lunch room is also an important meeting place. The fact that we share equipment means that resources can be used to fund equipment in new areas. It’s also important that the BMC is so close to the hospital, and that groups with different degrees of interest in clinical research are mixed on the different floors. All these factors combine to create greater competence, and lead to research projects that would not have been initiated in more homogeneous environments.”

Catharina Svanborg,  
Professor in clinical immunology



“One of the great strengths in health care and the University Hospital is that we have so many proficient preclinical and clinical researchers at the BMC and the hospital in Lund. We often talk of common platforms, for example, technical platforms, but we forget that proximity to our patients is perhaps the most important platform. Without it, it would be difficult to pursue clinical and translational research. The environment for this kind of research is unbeatable in Lund, even in an international perspective.”

Bent Christensen,  
Director, Lund University Hospital



## BRIDGES BETWEEN HEALTH CARE, EDUCATION AND RESEARCH

The BMC is the largest meeting place for education and research in Lund's academic world. Here, students, researchers, lecturers and health care professionals meet and work together.

### THE RESEARCH ENVIRONMENT AT THE BMC

The BMC is home to high-quality research in many different areas, some of which are: diseases of the brain, cancer, diabetes, inflammatory diseases, immunological diseases, diseases of the motor organs and stem cell research. Research in several of these areas is carried out by constellations of researchers with widely differing backgrounds and expertise.

One of the fundamental ideas behind the BMC is to facilitate contact between basic research and everyday activities at the University Hospital. Many successful research projects involve the cooperation of experimentally orientated researchers and others, often physicians, engaged in patient-related research. Many research groups at the University Hospital have their laboratories at the BMC. Distances are short, and

there is a "heavy traffic" between the hospital and the BMC. Patients at the University Hospital meet specialists with knowledge of the latest research findings, while clinical observations in their day-to-day work inspire physicians to perform research leading to the development of new methods of diagnosis and treatment.

Research at the BMC has been organised in a completely new way. The traditional division into subjects and departments has been replaced by "thematic mosaics" of research groups that gather to tackle different medical issues. Each of these environments includes researchers with expertise in various fields and with different perspectives, who work together towards a common goal. The interdisciplinary nature of the research is evident. Researchers from the Engineering, Medical and Science faculties of Lund University all work together at the BMC.

The working environment at the BMC is stimulating, and the researchers' work is facilitated by a professional service organisation that





"The infrastructure at the BMC is really good. Modern, well-equipped laboratories are available when we need them, and the cell-culturing facilities are the best I've seen. The proximity to other researchers is tangible, and the exchange with researchers in other areas is substantial, not to mention the liberal atmosphere. The BMC is really an asset for young scientists and heads of research groups who have not yet made a reputation for themselves in the scientific arena, but who want to recruit internationally qualified researchers."



Dr Olga Göransson, Head of the protein phosphorylation research group

"I spent most of my time during the first 2½ years of my medical studies at the BMC, where I became part of a larger community. All we need is available at the BMC – students can come in at any time of the day or night with their passcards. It's invaluable to be able to use the PBL rooms and study facilities, especially when we're revising for exams – 2 or 3 of us can sit and study together – it's perfect. Now we're working in different clinics in the hospital, but the BMC is still the place where we all meet. We call it our quality-of-life project, to meet here once a week."



Gabriel Adrian,  
Medical student

provides help in everything, from the daily running of the centre to advanced technical tasks. Experimental researchers have access to well-equipped laboratories and the technical platforms required for successful research.

#### **THE LEARNING ENVIRONMENT AT THE BMC**

Postgraduate students and medical students, biomedical students and biomedical analysts enjoy an excellent learning environment in the form of lecture halls, teaching laboratories computer facilities, group study rooms and meeting places. At the University Hospital across the road is the Faculty of Medicine's Learning Centre, providing study carrels, electronic journals and databases.

Lecturers are also active researchers, and students thus share the fruits of current research. The fact that education is provided in a rich research environment stimulates students' interest in and understanding of research, and the conditions that govern it. Within the faculty's library and IT organisation, librarians, IT staff, teachers and researchers continuously work together to improve teaching and learning environments.

At the BMC, students learn for life. In order to ensure that they continue to develop their competence

throughout their professional lives, they are prepared for individual learning during their medical studies. The method of problem-based learning used in Lund is based on the kind of real situations they will encounter in medical practice.

#### **THE INNOVATION ENVIRONMENT AT THE BMC**

Academia also meets industry at the BMC. The commercial development of biomedical innovations is stimulated by the Bioincubator located at BMC. This is one of several ways to increase the number of companies based on innovative ideas from the university and the University Hospital. At the Bioincubator, new companies have access to advanced laboratories and specialised equipment. Professional business developers help entrepreneurs, who also gain access to valuable networks, as well as help in obtaining start-up financing.

#### **THE BMC IN A WORLDWIDE PERSPECTIVE**

Research at the BMC is carried out in an international environment in which researchers from Lund work with those from other universities and university hospitals around the world. There are excellent opportunities for collaboration and the





"Working at both the BMC and the University Hospital allows the practice of translational clinical research to be extended to its utmost limit. We exchange knowledge and form different networks, and ideas for projects flow freely in the open, constructive atmosphere. The BMC catalyses and accelerates the processes of basic research, clinical research and entrepreneurship. The Bioincubator gives us the support we need when we decide the time is right to divide our efforts between the lab, patients and product development."



Dr Stefan Hansson,  
Senior lecturer in obstetrics and gynaecology,  
clinical researcher and entrepreneur



"It's in qualified and creative environments like that at the BMC that research leads to innovations. Ideon provides support for the innovation process so that good use can be made of the results of research to improve health. Incubators for developing companies and meeting places for innovators and entrepreneurs help researchers to realize their ideas. The Ideon brand helps start-ups to put themselves firmly on the map."



Hans Möller,  
CEO, Ideon Science Park

exchange of ideas in the Öresund Region, which boasts 12 universities, a large number of hospitals, of which 11 are university hospitals, 12 science & research parks and 40,000 employees in the life sciences. Medicon Valley is a well-known concept in biotechnology and medicine. The universities, hospitals, pharmaceutical companies and the biomedical industry in the Öresund Region work together within the framework of the Medicon Valley Alliance to promote medical development.

### COME TO THE BMC

The city of Lund has about 100,000 inhabitants, almost half of which have some connection with the university. Most of these are students, whose presence makes itself felt in the Medieval city. Lund has been a leading religious, academic and cultural centre since the 12th century. The university was founded in 1666, and Lund is characterised by both its past glories and its present successes. The compactness of the city and the use of bicycles rather than cars, make it a relatively tranquil city. The BMC is just a few minutes from the city centre by bicycle, and with the new bus service it takes less than ten minutes to reach the BMC from the central railway station. The short distances are even more noticeable in

the university's Northern Campus, where the BMC is located. The University Hospital, the Faculty of Science, the Faculty of Engineering (LTH), the Ideon Science Park, and a number of pharmaceutical and biotech companies are all within walking distance.

The county of Skåne has Sweden's best communications with the rest of Europe. The journey over the Öresund bridge from central Lund to the international airport at Copenhagen takes no more than 45 minutes. All European destinations can be reached from Copenhagen within three hours, and there are direct international flights to 122 destinations throughout the world. When the underground, the City Tunnel, is opened in Malmö the travelling time will be even shorter.

Skåne offers many lovely places to live, in both its towns and cities, and rural areas. Schools and day-care facilities are of the highest quality, and there are a number of international schools in Lund and in the nearby city of Malmö. Short distances and good communications make commuting quick and easy. Skåne has plenty to offer in terms of cultural as well outdoor activities. The cultural landscape and proximity to the sea contribute to the high quality of life in the region.





"The BMC and its facilities are the best I've seen in the world, and we'll soon be getting the absolutely latest instruments in neurological research. The technical staff are very competent and helpful. All the main areas in my field of research, neuroscience, are represented at the BMC. Translational research into the most common neurological diseases is especially good in Lund. Personal meetings and the environment in and around the BMC promote this kind of research."



Angela Cenci Nilsson,  
Professor in experimental medical research

"The BMC is good evidence of the development of Lund University, as one of the leading research centres in Europe. Its direct link to the University Hospital makes it possible for basic and clinical research to collaborate efficiently. At the same time, the BMC is a good example of interfaculty cooperation, given high priority by the university, mainly with the faculties of Engineering and Science. The BMC is the largest and most advanced research centre in the Öresund Region, and contributes to the credibility of Medicon Valley. The BMC is also a tremendous asset in our efforts to have large-scale international research facilities, such as MAX IV and ESS located in Lund. The Biomedical Centre in Lund shows convincingly that Lund University is capable of creating infrastructure of the highest class."



Allan Larsson,  
Chairman, Lund University Board

# JUST A FEW OF THE PROJECTS AT THE BMC

## RESEARCH IS BEING CARRIED OUT AT THE BMC...

... to develop improved methods for the diagnosis and treatment of cancer. CREATE Health is one of several prominent research environments for cancer research. Work is directed towards identifying biomarkers that can be used to customise treatment to the individual. Researchers in this field have competence in bioinformatics, nanotechnology, proteomics, genomics, clinical oncology, immunology and tumour biology.

... to create "connections" between the brain and computers with the ultimate goal of improving the quality of life of those affected by neurodegenerative diseases such as Parkinson's disease, and those with chronic pain. Within the NeuroNano Research Centre, neuroscience is combined with nanotechnology, microtechnology and biotechnology.

... to understand basic biological processes and to develop new methods of treatment based on stem cells, cell transplantation and gene therapy. The hope is that in the future it will be possible to cure diabetes and diseases that affect the brain and the circulatory system. Several world-leading experts in the field of stem cells are working at the Stem Cell Centre.

... to treat and prevent diseases that affect the brain, such as Parkinson's disease, stroke and Huntington's disease. Lund University has a long tradition of internationally renowned research in neurology. Today, research in this field is carried out in the NeuroFortis programme and the Basal Ganglia Disorders Linnaeus Consortium.

... to study the interaction between bacteria and man in infections. Better knowledge on these processes is a necessity for

the development of new treatment strategies. Among other things, it is being investigated whether the surface proteins of bacteria can act as vaccines.

... to obtain better knowledge on the regulation of the body's immune system and how this affects the genesis of different diseases such as autoimmune and inflammatory diseases, and cancer.

... to obtain a better understanding of the function of cells in blood vessels. Apart from affecting blood vessels by signalling contraction, cells, together with molecules in the blood, can cause inflammation and fatty deposits (plaque) on artery walls. Improved knowledge can lead to new ways of preventing common diseases such as high blood pressure and atherosclerosis.

... to understand the mechanisms behind diabetes and obesity. A better understanding of how, for example, fat is broken down and insulin released can lead to new concepts for treatment and preventive measures.

... to understand the mechanisms behind, and find new ways of treating, diseases that affect connective tissue, especially in joints and the skeleton, such as arthrosis, rheumatoid arthritis and osteoporosis, as they reduce the quality of life of many people. Work is also being directed towards the development of new methods of early diagnosis of these conditions.

Further information on the research projects in progress at the BMC can be found at:  
[www.med.lu.se/bmc](http://www.med.lu.se/bmc).



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