



Bochum. Strong Nerves, sharp Senses

Bochum.
Centre of the Healthcare Sector.

Foreword

Dear Readers,

Innovation in the healthcare sector – that's what Bochum stands for! At the heart of the Metropole Ruhr, with its around 130 clinics and more than 5 million inhabitants, our city has developed into one of the key centres for the healthcare sector and is a driving force in the region. Bochum lives healthcare!

This brochure is the first in a series about Bochum as a healthcare location. With an emphasis on “strong nerves and sharp senses” we will show you some selected projects and how they have developed.

Why? Because the driving forces behind the positive development of the healthcare city of Bochum include all the companies and institutions which produce knowledge, use knowledge and put it to use in medical products and services for the good



of patients. In addition to the local companies, investments from companies from elsewhere have given this development even more impetus. You will also find out more about the network of the Health Campus Bochum Agency, which has made strengthening this healthcare location its key task.

We look forward to more exciting cooperations and innovative products and projects which will be created and developed in our city in future. There are strong foundations here – as you can read about in this brochure – and you can make use of them too!

Thomas Eiskirch
Lord Mayor of the City of Bochum

Seeing with your ears.

Based on bats: navigating blind with radar.

People who are blind or have visual impairments naturally have some difficulties getting around in everyday life. The main aids so far have been guide-dogs and white sticks.

The research project RaVis-3D has set itself the aim of making great improvements to everyday support: funded by NRW and the EU (EFRE), stakeholders from the worlds of business and science are developing technology which registers the surroundings using radar and turns the information into audio signals and provides it for the user via a hearing aid in real time. It helps users to recognise obstacles and estimate distances enabling them to move relatively naturally within their surroundings. To ensure it is user friendly, people with visual impairments have been involved in these developments from the start. The project is supported by the Bochumer Institut für Technologie gGmbH (BO-I-T), which takes care of the project management and PR.

For RaVis-3D, Bochum is the best location. Dirk Kampmann, managing director of Kampmann Hörssysteme GmbH and, due to his comprehensive knowledge and experience in the field of audio output, lead manager of the project, explains why: “The experienced support provided by the BO-I-T, the Economic Development Agency and the Health Campus Agency Bochum means innovations in our city can move quickly from research into real applications. Even while products are being developed, plans are made for how to market them and make them available to patients as quickly as possible.”

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Project partners:

- Kampmann Hörsysteme GmbH
- SNAP GmbH
- Ruhr-Universität Bochum
- Dräger & Lienert Informationsmanagement GbR
- Berufsförderungswerk Halle
- GN Hearing GmbH
- Bochumer Institut für Technologie gGmbH



Cyberdyne Care Robotics GmbH

- Japanese-German joint venture, founded in August 2013
- Partners: parent company CYBERDYNE Inc., Japan and Berufsgenossenschaft Rohstoffe und chemische Industrie, Bochum

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Accompanied and supported by:

Ministry for Economic Affairs, Energy and Industry of the State of NRW • NRW Japan K. K. • Chip GmbH • Employers Liability Insurance Association University Clinic Bergmannsheil • BG RCI – Employers Liability Insurance Association Raw Materials and Chemicals Industry • contec GmbH • MedEcon Ruhr e. V. • IEGUS GmbH • Ministry for Health, Equality, Healthcare and Aging of the State of NRW • Health Campus Agency Bochum

From Japan, via Bochum, for the whole world

Highly specialised rehab technology from Japan finds a new home in Bochum.

Mirko S. had a car accident twelve weeks ago. He can't remember exactly what happened. The devastating news after his operation: paraplegia. He is now being treated at the University Clinic Bergmanskheil (BMH) and is already taking his first "steps" towards a new life.

Mirko would never have thought that an exoskeleton developed in Japan would get him moving again in Germany. For a few months now, he has been training every day at the Centre for Neurorobotic Movement Training (ZNB). Prof. Dr. Yoshiyuki Sankai, CEO of CYBERDYNE Inc Japan, designed the HAL®System, the Hybrid Assistive Limb, at Tsukuba University. Today the robot suit is marketed through Cyberdyne Care Robotics GmbH (CCR) in Bochum – this is no coincidence either, but the result of many different parties working together closely. As Prof. Dr. Sankai also wanted to establish the HAL®System on the European market, so the Health Campus Agency Bochum (AGC BO), chip GmbH and many established members of the MedEcon-Network together with the State of NRW and the NRW Japan K. K. to prepare way for them to set up in Bochum.

Consulting company contec GmbH and the Bergmanskheil clinic helped Prof. Sankai with all organisational, bureaucratic and location-related matters. They made sure that the necessary studies were carried out and that the system could be used quickly in Germany. This formed the basis for introducing this innovative technology throughout the whole of Germany and beyond. An established environment consisting of companies, clinics and researchers in the field of prosthetics is waiting for more cooperations in Bochum. Prof. Dr. med Thomas A. Schildhauer, Medical Director at BMH, explains: "Opening the ZNB is the result of great cooperation across all levels of the ecosystem in Bochum's healthcare sector. That is what distinguishes Bochum!"

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New hope for ears.

Auditory training at home – from Bochum.

Language is the key medium for human communication and is closely linked to hearing. Limited hearing ability often has a huge impact on people's lives and can even lead to social isolation.

In Bochum the "Train2Hear" project group comprising science, business and industry experts developed and tested a teletherapeutic, practice-based auditory training for people in the initial stages of hearing loss and wearers of cochlea implants. The digital auditory and language training enables people to practice on their own at home with guidance from speech therapists.

This research project is funded by the European Fund for Regional Development (EFRE). Prof. Dr. Kerstin Bilda, lead manager of the project and Vice President of the Research Division at the Hochschule für Gesundheit (University of Applied Sciences for Healthcare) talks about "Train2Hear": "The interdisciplinary cooperation between the Hochschule für Gesundheit, the ENT Clinic, Kampmann Hörsysteme and the company Q2Web is the distinguishing characteristic of

this project and provides excellent conditions for developing a successful digital system for speech therapy-based auditory rehabilitation." Prof. Dr. med. Stefan Dazert, Director of the ENT Clinic at the Ruhr-Universität Bochum continues: "The strong practical orientation of this project and the excellent patient involvement means we develop medical products with patients for patients. The location of Bochum also provides us with an excellent network and infrastructure for acting and positioning ourselves well beyond the region."

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- Prof. Dr. med. Stefan Dazert, Director of the ENT Clinic at the Ruhr-Universität Bochum
- Dirk Kampmann, Managing Director Kampmann Hörsysteme VerwaltungsGmbH
- Q2WEB GmbH

Partners in SNAP GmbH:

- WirtschaftsEntwicklungsGesellschaft Bochum mbH (Economic Development Bochum)
- Dortmund IGA GmbH
- Orthopaedic specialist Dr. F.W.Steinweg (Unna)
- Rainer Beckmann (Dortmund)
- Uwe Seidel (Herten) as Managing Director



I think, therefore I walk.

The company SNAP GmbH from Bochum provides a technology platform for developing products with neuronal controls. The acronym SNAP stands for Sensor Based Neuronal Adaptive Prosthetics. Example products include electrical prosthetic devices, electrically operated stand-up wheelchairs and exoskeletons.

MedEcon Ruhr GmbH and the Health Campus Agency Bochum's great networks in the Ruhr Region were a significant factor in founding SNAP GmbH in the year 2011. The core of this company, based in the BioMedicine Center Bochum (BMZ), is a test bed which can be flexibly combined with a virtual obstacle course equipped with measurement and sensor systems. It is partly supported with EU funds (EFRE).

Using electroencephalography (EEG) to record brainwaves related to movement and to correlate them with measurement data from other sensors in real time is the speciality of SNAP.

SNAP also provides EEG-based procedures for monitoring quality and verifying how therapy is progressing or for evaluating the vigilance of vegetative coma patients. SNAP chose Bochum specifically because of the BMZ.

Managing Director Uwe Seidel explains the advantages: "The Metropole Ruhr is Germany's largest market place for the healthcare sector – lots of customers, users and development partners for our technology platform are also located nearby. In the BMZ a network of highly innovative high-tech medical technology, biomedicine and healthcare companies are an inspiration for our developments. These positive location factors are strengthened even more by the scientific expertise on hand at the Ruhr-Universität Bochum and other universities in Dortmund, Duisburg, Essen, Gelsenkirchen and Witten."

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Publishing details

Published by

Wirtschaftsförderung Bochum WiFö GmbH

Agentur GesundheitsCampus Bochum

The executive board

Viktoriastraße 10

44787 Bochum

Germany