

Healthcare industry BW

Heinrich Planck: experienced interdisciplinarity

Only a few researchers combine different disciplines as effectively and with as much flair as Professor Dr.-Ing. Heinrich Planck, director of the ITV Denkendorf. He combines mechanical, textile and medical engineering both on the scientific and economic level at the same time as being a dedicated networker.

Pure chance laid the foundations for Professor Planck's versatility. Heinrich Planck from Rottenburg on the Neckar received his Abitur (German university entrance qualification) in 1967, the very year in which the beginning of a school year was shifted from Easter to autumn. This change led to two short school years resulting in two age groups starting university courses at the same time. This in turn made the Numerus clausus go up and Planck found himself unable to pursue his dream of studying medicine. He therefore decided to study mechanical engineering, which had less restrictive enrolment quota. He had a certain affinity with the field right back from his birth: Planck's parents owned a textile engineering company.

During his studies at the University of Stuttgart, Planck maintained his interest in medicine. He eventually specialised in technical textiles, specifically in the field of medical engineering, and in 1979 received his PhD in this field on the development of small-lumen vascular prostheses, a project that was funded by the BMBF. "This was one of the first projects funded by the BMBF in the field of medical engineering," recalls Planck who carried out the work at the Institute of Textile Technology and Process Engineering, which back then was located in Reutlingen. Planck established the interdisciplinary research area of biomedical technology and braiding technology/fibre reinforced composites.



Prof. Planck, a highly motivated networker (Photo: ITV)



The old ITV Denkendorf building with its sparkling new front (Photo: ITV)

After his doctorate, Planck remained true to these topics and made a considerable contribution to the transformation of the ITV Denkendorf into an internationally leading institute in this field. "At the beginning, biomedical engineering was a one-man show, gradually developing into a field with approximately 70 people, which I helped establish and which I used to run. Our projects were funded with public funds, mainly through the BMBF (German Federal Ministry of Education and Research) and the DFG (German Research Foundation). We worked in cooperation with industrial partners right from the very beginning, for example with Braun Melsungen, a company that has been an active partner ever since. One of the most important milestones was the development of artificial skin replacement on the basis of polymers, initially a cooperative project with the Marienhospital Stuttgart and today also involving PolyMedics Innovations GmbH. The new, resorbable artificial skin for the fast regeneration of skin has been marketed as "Suprathel® since 2005.

1996 was another year in which chance played another major role in Planck's life. Under his leadership, BMOZ – the German Centre for Biomaterials and Organ Replacement - was established. "BMOZ is indeed a true result of chance. We learnt about the competence centre call very late and prepared the application within a record time of only six weeks. We succeeded in bringing together engineers, technicians, chemists, biologists, medics and many others in order to create a platform for which industry evidently had good use. Back then, BMOZ was the biggest centre of its kind in Germany," said Planck.

Pioneer work: Planck's work is a decisive influence on the ITV Denkendorf



Patient 59 years old, 1 day after trauma (arc): It is obviously a deep dermal burn (2b) because of the whitish area of the extensor side of the fingers and the additional shrinkage of the skin in this area.



8 months after trauma (arc): Without meshgrafts or split skin grafts the result after application with Suprathel – stable and nearly scarfree epithelialisation, complete functionality. (Photo PMI GmbH)

Nowadays, as there are many centres in Baden-Württemberg that are active in the biomaterials sector, the interest in BMOZ has slightly diminished. However, Planck is already thinking further ahead into the future, and has plans to establish a superordinate organisational structure. BMOZ still forms the general framework for cooperative innovative projects, such as the development of nerve guidance conduits. This particular project is carried out in cooperation with the NMI Reutlingen and the BG Trauma Centre in Tübingen and for Planck is also a personal highlight of his scientific career. “We are hoping that these conduits will help nerves grow together in a precise way. The approach is very complex and the demands high. The development of appropriate structures and materials for this purpose is a huge challenge.”

The teaching package: textile technology, textile engineering and medical process technology

1996 was also a decisive year for Planck in other respects: He was appointed honorary professor at the University of Stuttgart for the major study field of biomedical process engineering. Since 1998, Planck has also held the chair for textile technology/textile engineering. He is using the resources of the ITV Denkendorf specifically for his teaching activities. “For me, practical training is the most important part of teaching,” highlighted Planck adding that, “The lectures are being held as block modules at the ITV. This has the huge advantage that we can combine them with on-site observations. The students are given the possibility of having a close look at the equipment directly in our institute.”

As Planck has been director of the entire ITV Denkendorf and its team of 200 since 1998, this has given him the necessary scope for implementing interdisciplinary concepts in research. “The ITV is not only the oldest German and the biggest European textile research institute, it is also the only one that covers all research and development steps from raw materials to the final product,” said Planck.

From the raw material to the final product

For Planck, one of the most exciting future fields is the development of “SMART textiles”, textiles with integrated sensors that measure vital parameters. “This has led to a broad range of projects; for example we are developing protective clothing for a broad range of professions, such as the fire brigade,” said Planck. These textiles are also suitable for the monitoring of patients suffering from

cardiac diseases. The sensors sound an alarm when certain values are outside the tolerance level.

Planck also sets great store on team spirit outside his institute; he is a member of numerous boards, associations and societies where he works to bridge the gaps between individual disciplines and to better exploit available synergies. The latest result of his interdisciplinary dedication in education and research is the IZST, the Interdisciplinary Centre of Medical Technologies Stuttgart-Tübingen. Planck was already a strong supporter of the establishment of this Centre in the planning phase and now heads the IZST together with his Tübingen colleague, Prof. Dr. Claus Claussen.

Integrating people and disciplines

In order to cope with his many tasks and activities, Planck follows his personal formula for success. "Listening, analysing, reacting," said Planck, succinctly describing his formula for success. He adds: "Time is always a question of how things are organised and delegated. I enjoy working in a structured manner and I like to bring people together." He gets the energy he requires for his professional activities from travelling and hiking. "I am interested in the world and enjoy learning about foreign cultures," said Planck, who is however unable to completely do without medical engineering in his free time; Planck spends many weekends developing ideas and correcting doctoral theses. His enthusiasm is apparently very contagious to his family; his daughter is studying medicine and his son works in business administration with a special focus on pharma and biomedicine.

There is one cloud on the horizon of Planck's enthusiasm: Financing in the political environment. "There are many ways to get good ideas financed, but the practically oriented research institutions often lack the necessary financial means to finance the equipment they need. "In for a penny in for a pound! This means, it is necessary to create an infrastructure that enables the realisation of Baden-Württemberg's aim of continuing its top research in the future. It should not be the case that the renovation of buildings and the procurement of bigger equipment have to be financed from research surplus that is not available in public research projects," said Planck. These resources cannot be generated in contract research either. That is why Planck is calling for decision-makers to have a greater awareness of sustainability.

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