



- 1 *Sirex™ – Drilling based on the model of Hymenoptera.*
- 2 *Biomimetic prosthesis of a venous valve.*
- 3 *Bionic bone punch.*

## BIOMIMETICS APPLIED IN MEDICAL ENGINEERING

### Optimization using biomimetics

The interdisciplinary field of biomimetics is the interface between biology and medicine on the one hand and the traditional engineering science on the other hand. The cooperation between them is to look for biological models for solutions of extensive problems and to realize a technical transfer.

### Leap innovations through biomimetics

The great potential for material and energy efficiency and sustainability of biomimetics meets the requirements of our time. Using biomimetics can empower scientists to create solutions that have the potential for leap innovations.

### Biomimetics for prostheses and implants

Just for the medicine the human body itself is available as best practice model. For the replacement of body functions it is

important to recognize the meaning and principles of the anatomical structures and their physiological relationships to abstract and develop a robust technical equivalent. Exo-prostheses and implants are good areas of application for the biomimetics.

### Biomimetic instruments

The infinite number of cutting, gripping, suction, drilling and crushing mechanisms in the animal kingdom provides innovative solutions for surgical instruments. The combination of multiple functions, for example lightweight and increased stability through intelligent structuring modeled after the proven nature, into one component, is an appropriate approach for product innovation.

### Fraunhofer – Your partner in bionics

Fraunhofer IPA works interdisciplinary and is a specialist in application-oriented biomedical research using the biomimetic development methodology.

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