

To reach translational objectives: the Bioengineering challenge within CIBER-BBN

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For years, bioengineers have been trying to bring together knowledge and technologies from the engineering world and knowledge and life sciences from the biomedical world with a clear objective: to contribute to the advancement of health through the adaptation and development of technologies

- For easy, accurate and non invasive diagnoses
- To enhance predictive and preventive know-how and capacities
- To develop high technology based devices for local or remote on-line monitoring of relevant vital parameters by having multimodal functionalities suitable for clinical use
- To develop new instrumentation and models allowing scientific progresses and a more in depth knowledge of living mechanisms. Micro-Nano-Bio systems can help to know and interact with high level behavior such as learning mechanisms or psychological diseases up to, on the micro-nano side, to unlock specific aspects of cellular metabolism, membrane structures or gene behaviors.
- To propose and validate new therapies coming from the new knowledge and new available technologies.
- To propose and validate new devices and systems allowing functional recovery and improvement
- To develop technologies and devices to help developing and emerging fields such as biotechnology, cellular and molecular engineering, etc.

Following these main lines, the Biomedical Applications Group, GAB, today within the CIBER-BBN is trying to take advantage of its own technological facilities and its scientific and technical know-how, to transform the innovation possibilities of micro-devices and related technologies into successful commercial biomedical products and advanced applications.

In the recent past the most relevant work of GAB has been the development of microsystem devices to monitor relevant heart parameters during open heart surgery, to measure graft viability on transplants, to contribute to functional recovery of blind people and to set-up the sensing modules on a telemedicine application.

Concerning technology, a service of micro and nano fabrication including a carbon nanotube growth service has been set-up.

Concerning applications, today and in the near future we are working on the development of microsystem devices and instrumentation to measure the osteointegration level in implants, the degree of liver steatosis, the corneal endothelial permeability through a non-invasive way, to detect and to remove biofilms and the detection of p53-antibodies for early cancer prognostic. We are also taking the first steps in some other domains such as instrumentation to measure osteoporosis, to give objective measurement of some psychic and somatic diseases and on the development of micro-nano systems for multifunctional stents and catheters.