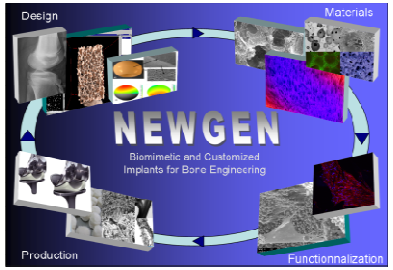
Instituto de Biomecánica de Valencia

GENERAL PRESENTATION

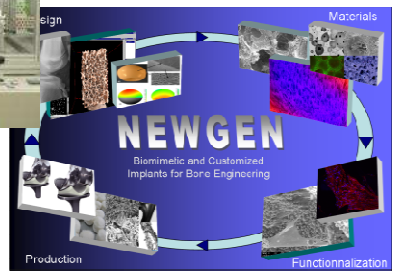
INSTITUTO DE BIOMECÁNICA DE VALENCIA

- ✓ **Complete denomination**: Grupo de Tecnología Sanitaria, Instituto de Biomecánica de Valencia (IBV) and CIBER-BBN
- ✓ **Location (city, country)**: Valencia, Spain
- ✓ **Director**: Pedro Vera Luna
- ✓ **Contact person in NEWGEN**: Dr. José L. Peris
- ✓ **Working Group involvement**: WG4
- ✓ **Staff**: 150
- ✓ **Research topics**:
  - ✓ Implants design and biomechanical characterization of implants,
  - ✓ Experimental surgery in rabbits to study in vivo behavior, biomaterial scaffolds,
  - ✓ Bone and cartilage histomorphometry from undecalcified samples.
  - ✓ Densitometric studies from CT and RMN images using Materialise software.
  - ✓ Finite element modeling. Implants customization.



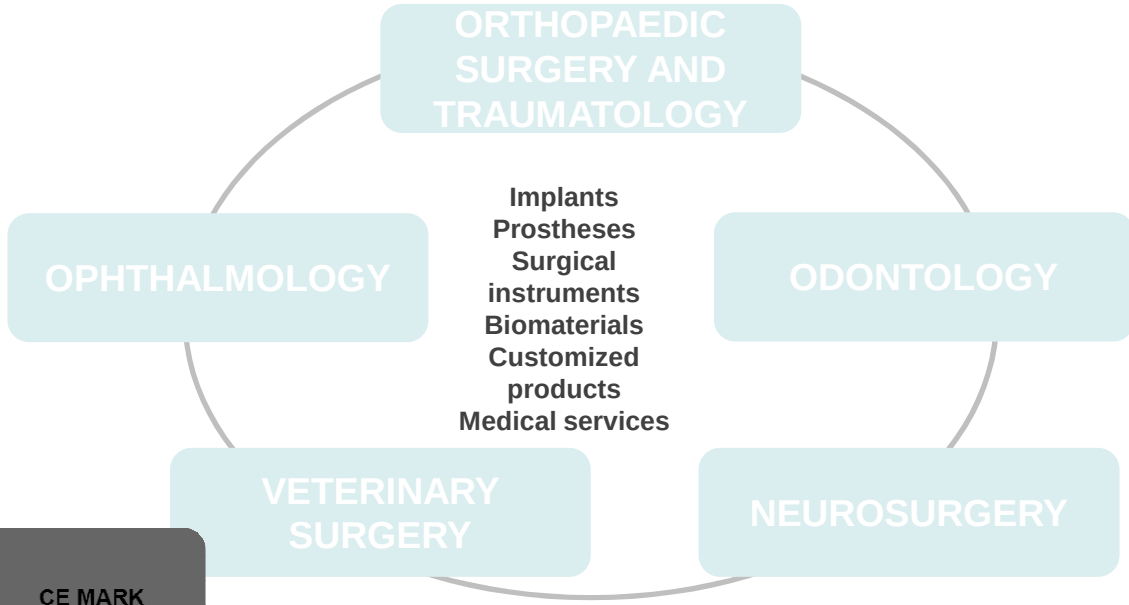
Facilities

- Movement Analysis Laboratory.
- Functional Evaluation, Body Damage and Disability Laboratory.
- Ergonomics Laboratory.
- Footwear Functional Design Laboratory.
- Technical Aid Laboratory.
- Paving Surface Laboratory.
- Sport and Leisure Laboratory.
- Climatic Comfort Laboratory.
- Surgical Implant Laboratory.
- Histology facilities.
- Image Analysis Laboratory.
- Operating Theatre.
- Animal facilities.
- Mechanical Testing Laboratory.
- Metrology Laboratory.
- Instrumentation and Electronics Laboratory.
- Information Technology Laboratory.
- Industrial Design Laboratory.
- Mechanical Workshop and Prototyping Laboratory.
- Experience Laboratory (Living Lab).
- Library-Newspaper and Periodicals Library.

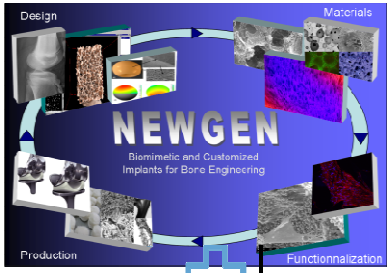


Services for the Healthcare Technology sector

Activities of the IBV in the **Healthcare Technology field** aim at directing innovation towards the improvement of people's health, well-being and quality of life and, at the same time, providing companies and entities that offer medical products and services with business keys to increase their competitiveness and differentiation in the market.



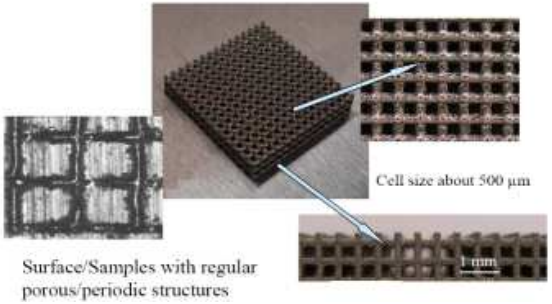
PRODUCT DESIGN	PRODUCT EVALUATION	BIOMATERIAL EVALUATION	CE MARK DOCUMENTATION
Identification of needs	Mechanical tests	Mechanical characterization	Essential requirements
Definition of design specifications	Analytical models	Osteointegration	Risk analysis
Conceptual and detailed design	Wear studies	Bone tissue regeneration	Clinical evaluation
Selection of materials and manufacturing techniques	Non-standardized tests	Biocompatibility	

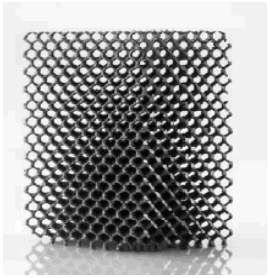


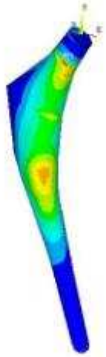
COST Action MP1301

Product design and product testing

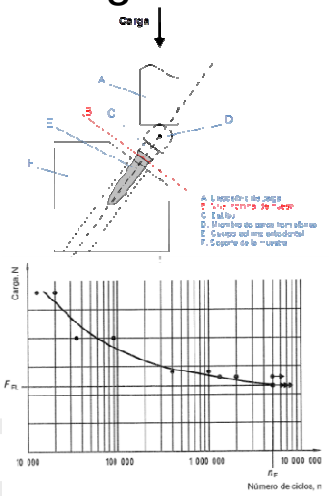
IBV has collaborated during the design of a bone substitute manufactured in porous metal by additive technologies.

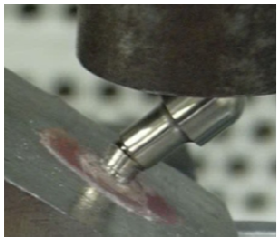


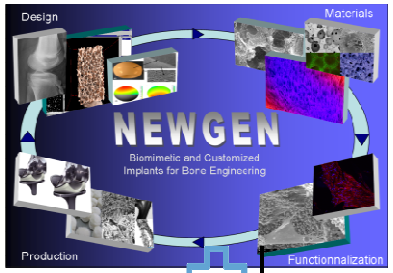




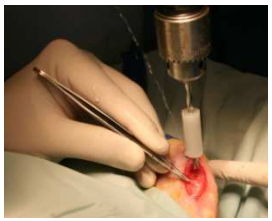
Static & dynamic fatigue tests of endosseous dental implants (ISO 14801)



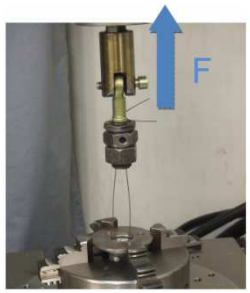




Biological assessment of new materials / coatings

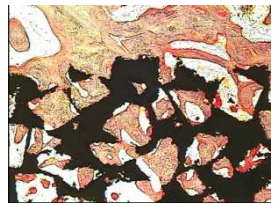


- Technical advise for structure / scaffold design
- Biomechanical characterization of new materials / coating
  - Study variable: extraction force (N)

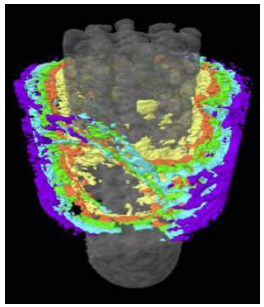


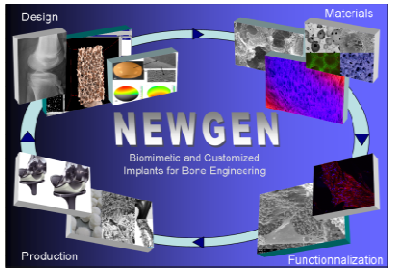
- Biological assessment of new materials / coatings:

  In vivo assessment
  - Implantation studies
    - Densitometry & 3D reconstruction
    - Osteointegration experimental models (New Zealand Rabbit)
      - Diaphyseal fracture
      - Cylindrical defect in femoral condyle
      - Critical sized defect in radius
      - Cylindrical defect in tibia
      - Spine



  - Biocompatibility studies of materials and wear particles





Biocompatibility tests

Irritation test ISO 10993-10:

- Patches with a material sample (powder o liquid)

Sensitization test ISO 10993-10:

- Intradermal application (non-diluted extract of the material)

Implantation test in bone/tissue >30 days ISO 10993-6:

Acute & sub-acute toxicity ISO 10993-11:

- Toxicity of: Materials (samples). Wear particles
- Assessment:
  - Observation and record of physiological and behaviour alterations. Analytic urine & hematologic study
  - Histological study of the implant and surrounding tissue.
  - Necropsy. Histopathology