ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

PHARMACEUTICAL BIOTECH

Medical and pharmaceutical industries including vaccines and antibiotics, regenerative therapies and new diagnostics of diseases.

The University of Bologna can offer multidisciplinary skills and expertise for research, applied studies and technology transfer in the field.

The research of the University of Bologna covers a wide range of issues:

- Development of preventive cancer vaccines through viral reprogramming
- Isolation, expansion and differentiation of stem cells of different human and animal origin, including Induced Pluripotent Stem Cells IPS: a platform of cell production, characterization and their exploitation towards therapy
- Development of cell biosensors based on genetically engineered cells (e.g., bacterial, yeast and mammalian cell lines) for diagnostics, drug screening and clinical applications
- Development of molecular (nano) biosensors towards molecules of interest for pharmaceutical industry and for clinically-relevant biomarkers (also at the point-of-care)
- 2D and 3D in vitro and in vivo models for testing of safety and efficacy of potential drugs and bioactive molecules (also in compliance with Replacement Reduction Refinement RRR principles and Good Laboratory Practice GLP)
- Development of new precision-medicine tools based on omics (transcriptomics, metabolomics, epigenomics, gut microbiota through Next Generation Sequencing NGS, bioinformatics, advanced analytics) and on advanced imaging (electron, confocal, optical, atomic force microscopy, live-animal imaging)
- Development and application of computational methods for drug-target interactions and in silico screening of molecular libraries
- Separation and purification of pharmaceutical products and recombinant macromolecules through chromatography techniques

HIGHLIGHTS

The University of Bologna contributes to the international research progress working on funded projects at European level and by developing and making available innovative solutions:

- **Laboratory Animal Facilities** for mice (transgenic or not), rats, guinea pigs and zebrafish; breeding, primary cultures, treatments, behavioral and ex vivo tests, also operating in GLP
- A distributed **microbiological collection** of more than 200 bacteria and yeasts strains, including human pathogens (e.g. food or water-borne) and non-pathogens (e.g. microbiota)
- **WellMicro** spin-off provides the analysis of one's personal gut microbiota and nutritional/therapeutic personalized counseling based on one's own 'microbiopassport'
- **StemSel** spin-off provides innovative instrumentation for regenerative medicine for selection and sorting of stem cells
- IMI 2 **HARMONY** and **HARMONY PLUS**
- H2020 **ORTHOUNION**, **QSPainRelief**, and **DECISION**