

TEMPLATE RICHIESTA ATTIVAZIONE TOPIC AGGIUNTIVI SU FONDI PNRR

D.M. 9 aprile 2022 n. 352

Project title/Titolo del Progetto	Surgical treatment of septic non-unions with limited antibiotic therapy.
Principal Investigator	Alexander Kirienko alexander.kirienko@humanitas.it
Main field of interest/Ambito principale di ricerca	Orthopedics and traumatology: non-unions and post-traumatic deformities treatment
Abstract	<p>New diagnostic techniques showed microbial colonization in unexpected environment, previously considered as sterile body-sites, such as native joints and osteosynthesis material in healthy patients with no signs of infection.</p> <p>On the other hand, physiopathology of septic non-union is not clear and further work is needed to understand the complex host-microbe interactions which could lead to a pathological condition.</p> <p>Our unit is a reference center for septic non-unions which has dealt with several cases of unsuccessful multiple surgeries and long-lasting iv antibiotic therapy. In our daily practice, we prioritize hardware removal and necrotic tissue debridement in order to enhance host immune defence, rather than routinely prescribe antibiotics.</p> <p>Our aim is to investigate these factors as a keystone in the comprehension of this complex scenario. In this project, the PhD applicant will study the role of tissue viability and biomechanical stability in the process of fracture and infection healing from the animal model to the clinical setting.</p>
Type of Co-funding	X D.M. 352/2022 - Borse di dottorato cofinanziate dalle imprese ¹
Lab name and address	Humanitas – Translational Orthopaedics Department in collaboration with the The University of Milan Centre for Clinical Veterinary Medicine and Experimental Zootechny (Via dell'Università 6 - 26900 Lodi)
Brief description of the coherence of the Project in relation to the PNRR objectives ³	Long bone non-union are devastating chronic pathology and seriously affect patients quality of life as much as other medical conditions, even more than congestive heart failure. Furthermore, infected non-union have a high financial impact including direct costs of treatment and indirect cost, such as productivity losses. Finally, judicious use of antibiotics is highly recommended in order to combat antimicrobial resistance, which is one of the most important goal for public health.
N. of months abroad (min. 6, max. 18) [compulsory]	6 months
Name of the research institution/company abroad	The Vreden Russian Research Institute of Traumatology and Orthopedics (Saint-Petersburg, Russia). Pr Leonid N. Solomin
N. of months of internship (min. 6, max. 18) [compulsory only for D.M. 352/2022]	6 months



Name of the company ³	DIAL Medicali (Viale Berbera 45, 20162 – Milano)
Scientific references	<p>REFERENCE</p> <p>Zhao Y, Chen B, Li S, et al. Detection and characterization of bacterial nucleic acids in culture-negative synovial tissue and fluid samples from rheumatoid arthritis or osteoarthritis patients. <i>Sci Rep.</i> 2018 Sep 24;8(1):14305. doi: 10.1038/s41598-018-32675-w.</p> <p>Foster AL, Moriarty TF, Zalavras C, et al. The influence of biomechanical stability on bone healing and fracture-related infection: the legacy of Stephan Perren. <i>Injury.</i> 2021 Jan;52(1):43-52. doi: 10.1016/j.injury.2020.06.044</p> <p>McClure PK, Abouei M, Conway JD. Reconstructive options for tibial bone defects. <i>J Am Acad Orthop Surg.</i> 2021;29:901-909. doi: 10.5435/JAAOS-D-21-00049</p> <p>Knabl L, Kuppelwieser B, Mayr A, et al. High percentage of microbial colonization of osteosynthesis material in clinically unremarkable patients. <i>Microbiologyopen.</i> 2019 Mar;8(3):e00658. doi:10.1002/mbo3.658</p> <p>Torrens C, Marí R, Alier A, et al. Cutibacterium acnes in primary reverse shoulder arthroplasty: from skin to deep layers. <i>J Shoulder Elbow Surg.</i> 2019 May;28(5):839-846. doi: 10.1016/j.jse.2018.10.016</p> <p>Wildemann B, Ignatius A, Leung F, et al. Non-union bone fractures. <i>Nat Rev.</i> 2021;7:57 https://doi.org/10.1038/s41572-021-00289-8</p> <p>Schottel PC, O'Connor DP, and Brinker MR. Time Trade-Off as a Measure of Health-Related Quality of Life: Long Bone Nonunions Have a Devastating Impact. <i>J Bone Joint Surg Am.</i> 2015;97:1406-10</p> <p>Antimicrobial Resistance Collaborators. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. <i>Lancet.</i> 2022 Feb 12;399(10325):629-655. doi: 10.1016/S0140-6736(21)02724-0</p>
Type of contract	<p>PhD scholarship of at least € 18.000 gross per year awarded by Humanitas University. This sum is exempt from IRPEF income tax according to the provisions of art. 4 of Law no. 476 of 13th August 1984, and is subject to social security contributions according to the provisions of art. 2, section 26 and subsequent sections, of Law no. 335 of 8th August 1995 and subsequent modifications.</p>