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Institute of Affiliation	Università degli Studi di Torino
Title of the proposed project:	Platelet function evaluation in patient with lung cancer
Short description of the project	<p>Solid cancers, and in particular Lung cancer, are associated with a markedly increased risk of arterial and venous thromboembolic events, which substantially contribute to morbidity and mortality. Emerging evidence indicates that platelets actively participate not only in thrombosis but also in tumor progression, immune evasion, and metastasis. However, the functional characteristics of platelets in patients with lung cancer remain poorly understood, and reliable biomarkers for thrombotic risk stratification are currently lacking. This PhD project aims to investigate platelet function in patients with non-small cell and small cell lung cancer, evaluating its relationship with tumor molecular profile, disease stage, metastatic burden, and clinical outcomes. The study will combine prospective and retrospective patient cohorts to characterize platelet reactivity using state-of-the-art functional assays, including platelet aggregation testing, flow cytometry, intracellular signalling analysis, ELISA-based inflammatory pathway assessment, and platelet metabolomics. Functional findings will be integrated with clinical, laboratory, and molecular data to identify biomarkers associated with thrombotic complications and disease progression. The project is expected to improve the understanding of the mechanisms linking cancer biology and platelet activation, identify patient subgroups at particularly high thrombotic risk, and provide the basis for personalized strategies for thromboprophylaxis and antithrombotic treatment. In addition, the identification of platelet-related biomarkers may offer novel prognostic indicators and contribute to the development of precision medicine approaches in thoracic oncology. The research will be conducted at the TRECIM Laboratory (dept. of Clinical and Biological Sciences, Orbassano, University of Turin), where advanced expertise in platelet biology, translational thrombosis research, and biomarker discovery provides an ideal environment for multidisciplinary investigation and the translation of laboratory findings into clinical practice.</p>
Main research area for the project	Cancer biology
5 keywords for the project	Tumor-stroma interaction – Microenvironment - Cell migration, motility and/or invasion – Metastasis - Hemostasis and thrombosis

LAB INFO	
Main topic/s of the lab	Assessment of Platelet Function and Investigation of the Non-Hemostatic Roles of Platelets in Cancer Biology
Short description of the lab activity	<p>Our laboratory at TRECIM (Translational Research in Cancer, Inflammation and Metabolism) is dedicated to investigating the molecular and cellular mechanisms linking cancer biology, thrombosis, inflammation, and vascular dysfunction. The laboratory combines basic, translational, and clinical research to identify novel mechanisms driving tumor progression and to develop innovative biomarkers and therapeutic strategies for precision oncology. A major research focus is the study of the bidirectional interaction between cancer cells and the host microenvironment, with particular emphasis on the role of platelets, endothelial cells, and the coagulation system in promoting metastasis and cancer-associated thrombosis. Current projects investigate how tumor-derived metabolic signals reshape the vascular microenvironment, leading to platelet activation, endothelial dysfunction, and the generation of tumor-educated platelets (TEPs), which actively contribute to metastatic dissemination and thrombotic complications. The laboratory employs a multidisciplinary approach integrating molecular biology, cell biology, biochemistry, flow cytometry, advanced platelet function testing, metabolomics, and in vivo mouse models of cancer and thrombosis. Particular expertise has been developed in the functional characterization of platelets through aggregometry, intracellular signalling analyses, immunophenotyping, ELISA-based assays, and metabolic profiling. These experimental platforms are complemented by advanced imaging techniques and functional testing (T-TAS) to dissect the complex interactions between tumor cells, the vascular compartment, and circulating blood cells. An important strength of the laboratory is its strong translational orientation. Close collaboration with clinical departments allows the integration of mechanistic studies with patient-derived samples, enabling the validation of experimental findings in cohorts of patients with solid tumors, particularly lung cancer. This bench-to-bedside strategy facilitates the identification of clinically relevant biomarkers of thrombotic risk, disease progression, and therapeutic response. Our aim is to redefine the role of platelets beyond their classical function in hemostasis by elucidating their non-hemostatic activities in cancer biology. Through the integration of experimental and clinical research, the laboratory aims to uncover novel therapeutic targets capable of limiting metastatic progression and improving the management of cancer-associated thrombosis. This multidisciplinary environment provides excellent opportunities for young researchers to develop expertise at the interface of oncology, vascular biology, hematology, and translational medicine.</p>
Recent bibliography	IκBα targeting promotes oxidative stress-dependent cell death. J EXP CLIN CANC RES 2021 Apr; 40: 136

	<p>Clonal hematopoiesis by DNMT3A mutations as a common finding in idiopathic splanchnic vein thrombosis. HAEMATOLOGICA 2023 May; 108: 1447</p> <p>Aberrant Platelet Aggregation as Initial Presentation of Essential Thrombocythemia: Failure of Entero-Coated Aspirin to Reduce Platelet Hyperactivation. INT J MOL SCI 2023 Dec; 25: 108154</p> <p>Mitochondrial IκBα fuels cancer progression through metabolic rewiring, endothelial activation, and thrombotic spread. Cell Death Discov 2026 Mar; 12: 108154</p> <p>Anti-Phosphatidylserine/Prothrombin Antibodies Identify a Distinct Form of ITP. EJHAEM 2025 Oct; 6: e70154</p>
Group composition	2 associate professors, 1 technician, 1 research fellow, three clinical investigators, three students
Institutional page link	https://www.dscb.unito.it/do/home.pl?_nfls=false