Annex 2

- Architecture and Design Cultures, Knowledge and Safeguarding of Cultural Heritage
- Development Economics and Local Systems (DELoS)
- Biomedical Sciences

ARCHITECTURE AND DESIGN CULTURES, KNOWLEDGE AND SAFEGUARDING OF CULTURAL HERITAGE

Director prof. Francesco Collotti

PROGRAMME	NextGenerationEU – (PNR)	**CUP**	B55F21007810001
SCHOLARSHIP	**1**		
TITLE OF THE SCHOLARSHIP	**From BIM to Digital Twin. Information management to support decision-making processes in the life cycle of buildings.**		
RESEARCH TOPIC	In recent years, the construction sector is also transforming into a data-driven production sector. In particular, Building Information Modeling (BIM) is able to support the use of big data produced in the different phases of the life cycle of buildings, making it possible to experiment with Artificial Intelligence (AI) for the optimization of the various processes of analysis, simulation, predictive evaluation, concerning the quality of the built environment. The operating phase of a real estate asset involves approximately 70% of the total investment and management costs in the entire life cycle of the building and the management and monitoring of spaces, building components and systems play a decisive role in guaranteeing the well-being and health of users. In Facility Management (FM), the availability of reliable and real-time updated databases on physical assets becomes a central issue in order to plan effective control, maintenance and evaluation of interventions in the ordinary and / or emergency phases. To this end, the flow of data from sensors (Internet of Things) located inside the buildings for real-time monitoring of the environmental quality of the spaces and the performance levels of building and plant components, can be suitably integrated with the information. structured within BIM models of assets, pre-establishing coherent databases. The integration between BIM and IoT therefore declines the creation of Digital Twin (DT), in which the data coming from the sensors combined with the information on the physical asset, allow continuous monitoring through effective forms of data visualization. The research aims to define areas of application and implementation processes of the Digital Twin to Cultural Heritage. Operational solutions will be developed for the case studies identified with in-depth analysis of open data models for built heritage.		
Study/Research periods abroad	1-3 months		

INTERVIEW				
LANGUAGE	**DATE**	**TIME**	**MODE**	**PLACE**
Italian	14th December 2022	10:00 a.m.	In-person*	Dipartimento di Architettura (DIDA) Via della Mattonaia, 8 - Firenze

* In the application form candidates residing abroad may ask to conduct the interview remotely

DEVELOPMENT ECONOMICS AND LOCAL SYSTEMS (DELOS)

Directorprof. Donato Romano

PROGRAMME	Agenzia per la Coesione Territoriale – "Dottorati Comunali"	**CUP**	E59J21007730005
INSTITUTION	Unione dei Comuni Montani del Casentino - Area Interna del Casentino e Val Tiberina		
SCHOLARSHIP	**1**		
TITLE OF THE SCHOLARSHIP	**Enhance natural and cultural resources, through the creation of new innovation and employment circuits in Casentino and Valtiberina**		
RESEARCH TOPIC	The project idea arises from the need to investigate the potential of the territory and the conditions necessary to promote the construction of innovative employment circuits starting from the recognition, enhancement / use in a creative and innovative key of the local cultural and natural heritage. The research project is configured as a research-intervention and is coherently part of the "Area Strategy" developed for the Casentino - Valtiberina territory within the SNAI, in which forestry and agriculture are specifically identified. and slow tourism as privileged areas for the sustainable economic development of the area. Furthermore, the establishment of networks of diversified subjects who work stably to promote the development of social agriculture activities and the production, transformation and channeling of local organic agricultural products, km 0, short supply chain in the project area and in the area, is also hoped for. strategy, as an opportunity to respond to the need to create new job opportunities for unemployed young people, guaranteeing social and work inclusion paths for disadvantaged people, with a strong drive for innovation. The project is also intended as a continuity and as a further opportunity for in-depth study of the paths activated within the framework of the Casentino-Valtiberina Internal Areas Strategy, specifically: Preparation of associated forest planning; innovation, production and sale of quality products from Casentino and Valtiberina; social agriculture in the mountains of the spirit (action that aims to enhance multifunctionality in agriculture, soft mobility and slow tourism (infrastructure and accessibility).		
Study/Research periods abroad	1-3 months		
INSTITUTION	Unione dei Comuni Valdarno e Valdisieve - Area Interna Valdarno e Valdisieve, Mugello e Val di Bisenzio		
SCHOLARSHIP	**1**		
TITLE OF THE SCHOLARSHIP	**Analysis of the offer, accessibility and quality of essential services in the Municipalities belonging to the Union of Municipalities Valdarno and Valdisieve**		
RESEARCH TOPIC	The research project stems from the need to investigate how the supply, full accessibility and quality of essential services can be guaranteed for all the inhabitants of the municipalities belonging to the Union of Valdarno and Valdisieve Municipalities. Therefore, the research project is coherently with the "Area Strategy" developed for the territory within the SNAI, in which local public transport, education and social and health services represent the essential services to guarantee a full active citizenship of all inhabitants, leaving no one behind and reducing depopulation. In particular, starting from the cognitive frameworks and the analyzes already recently developed for the SNAI and for the territorial planning tools, the research project intends to analyze: organization; The active actors in the field of education and education and the possible creation of an educating community; The supply and accessibility (physical, infrastructural, economic) of LPT based on the needs of citizenship and the ability to connect with the attracting poles (cultural, sporting, commercial, productive, training) of the Metropolitan City of Florence; The current and potential forms of participation and governance based on the interaction and synergies between local actors in a Quadruple Helix model. For all these areas, particular attention will be paid to the analysis of the		

	most vulnerable groups and most frequently excluded from the use of essential services, as well as the needs of young people in the area in order to avoid their abandonment. To do this, the research project involves the use of a broad methodological toolkit which includes: use of geo-spatial data through Geographic Information Systems; Social Network Analysis; creation of Living Labs and other participatory methods; use of big data and new information sources; collection, systematization and analysis of data from secondary sources; administration of surveys and data analysis.
Study/Research periods abroad	1-3 months

INTERVIEW				
LANGUAGE	**DATE**	**TIME**	**MODE**	**PLACE**
English	13th December 2022	05:00 p.m.	In person*	Dipartimento DISEI aula 2.03 Via delle Pandette 9 50127 Firenze,

* In the application form candidates residing abroad may ask to conduct the interview remotely

BIOMEDICAL SCIENCES

Director prof. Fabrizio Chiti

PROGRAMME	Ecosistemi dell'Innovazione – THE Tuscany Healthcare Ecosystem (PNRR)	**CUP**	B83C22003920001
SCHOLARSHIPS	**2**		
TITLE OF THE SCHOLARSHIP	**Development of 3D collagen scaffolded stromalised microtissues**		
RESEARCH TOPIC	The 3Rs principle, encouraging alternatives to animal testing, is pressing research to find new models that may accompany or substitute animal experimentation. We aim at developing 3D cellular models closely mimicking native tissues, reconstructing a "quasi-vivo" complexity, responsive and amenable to high content imaging as well as biochemical endpoints. Strength points are: 1) the use of different cell populations to reconstruct the microenvironment (co-culture of cells from solid tumors, cancer associated fibroblasts, endothelial cells, etc). 2) the use of novel scaffolds, based on different types of native and denatured collagen microparticles, with different external dimensions and internal porosities, to favour 3D microtissue assembly and to shape its behaviour. We termed our products *microtissues* as the 3D configuration and the dynamic environment contribute to generate a milieu which closely reproduces the in-vivo scenario, allowing to perform complex studies of tissue-tissue interaction. We aim to obtain models useful to study tumor development and metastatic progression, drug and nutrients delivery and sensitivity, as well as the interplay with biochemical cues.		
Study/Research periods abroad	3 months		
TITLE OF THE SCHOLARSHIP	**Clonality analysis in cutaneous lymphoproliferative disorders through comparative study of different methods: effects on diagnostic accuracy and understanding of clinico-biological course**		
RESEARCH TOPIC	The evaluation of clonal rearrangement of T-cell receptor (TCR) and B-cell receptor (BCR) genes is an ancillary diagnostic method to differentiate neoplastic (primary cutaneous T-cell –CTCL and B-cell lymphomas –CBCL, respectively) from reactive lymphoproliferative disorders (pseudolymphomas –PSL). The method currently used is based on a primer kit (BIOMED II, short DNA fragments) for a Polymerase Chain Reaction (PCR), followed by separation of bands amplified by acrilamide gel or capillary electrophoresis. This method has limitations in terms of sensitivity, specificity and reproducibility, as well as being time consuming and technically complex. Recently, some research groups have started to replace PCR with TCR and BCR repertoire analysis by high-throughput sequencing (HTS) method, thus allowing a faster experiment performance and result standardization. Others have proposed using clonality analysis of tumour cell DNA somatic mutations rather than TCR and BCR repertoire analysis. No studies are so far available which definitely demonstrate the superiority of HTS over PCR methods regarding diagnostic accuracy The aim of this study is to validate HTS methods as gold standard in the molecular diagnosis of cutaneous lymphoproliferative disorders, and to evaluate their significance for understanding the clinical and biological course.		

Study/Research periods abroad	3 months

INTERVIEW				
LANGUAGE	**DATE**	**TIME**	**MODE**	**PLACE**
Italian	14th December 2022	09:30 a.m.	In person*	Auletta 1 Viale Morgagni 50 - Firenze

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