Università
Ca'Foscari
Venezia

PROJECT ACRONYM AND TITLE: **DC-ren - Drug combinations for rewriting trajectories of renal pathologies in type II diabetes (DC-ren)**

FUNDING PROGRAMME: **Horizon 2020 - H2020-SC1-BHC**

CALL: **H2020-SC1-BHC-2018-2020**

SCIENTIFIC FIELDS: **Systems medicine**

HOST DEPARTMENT: **ECLT - European Centre for Living Technology**

SCIENTIFIC RESPONSIBLE: **Irene Poli**

FINANCIAL DATA:

Project total costs	Overall funding assigned to UNIVE
€ 5.968.480,00	€ 781.405,00

ABSTRACT:
Diabetic Kidney Disease (DKD) is highly prevalent in type 2 diabetes, with major impact on patients and healthcare systems. The complex disorder, further modulated by cardiovascular comorbidities, presents as an accumulation of risk factors, which we treat with drug combinations. While the overall benefit of this approach is evident on a cohort level, individual patients show remarkable heterogeneity in drug response, and lack of guidance on personalized medication results in suboptimal control of the disorder. For resolving variability, we propose a new concept for personalization of drug combinations beyond the cohort-centric perspective. We improve patient stratification based on equivalence relations of clinical presentation, disease pathophysiology and drug combinations. The approach is derived from dynamical systems theory, aimed at reducing probabilistic assignment of patient-specific disease evolution and matching drug combinations. The availability of a large European repository holding DKD patients in routine care with diverse drug combinations, complemented by high-throughput screening for improving patient phenotyping, and molecular network modelling of pathology, embedded risk factor combinations and consequence of drug effect allows a systems representation of patient groups. Integrating clinical presentation and molecular architecture in a novel computational framework will establish a decision support software prototype. We will validate this tool for predicting optimized personalized drug combinations in a study using given clinical trial repositories. Demonstration will expand to other available drugs, which in combination with approved drugs promise benefit for groups of DKD patients. With a clear route toward uptake in the clinical setting, and generalization capacity of our approach to other complex disorders we foster next steps in personalization, anticipate major patient benefit, and see novel translation and business opportunities.

Planned Start date	Planned End date
2020, TBD	60 MONTHS

PARTNERSHIP:

1.	MEDIZINISCHE UNIVERSITAT INNSBRUCK (MUI), the Coordinator	AT	Coordinator
2.	EMERGENTEC BIODEVELOPMENT GMBH	AT	Partner
3.	MEDIZINISCHE UNIVERSITAET WIEN (MUW)	AT	Partner
4.	MOSAIQUES DIAGNOSTICS GMBH (MOSAIQUES)	DE	Partner
5.	ACADEMISCH ZIEKENHUIS GRONINGEN (UNIVERSITAIR MEDISCH CENTRUM GRON)	NL	Partner
6.	UNIVERSITA CA' FOSCARI VENEZIA (UNIVE)	IT	Partner
7.	WEIZMANN INSTITUTE OF SCIENCE LTD (WEIZMANN)	IL	Partner
8.	REGION HOVEDSTADEN (REGIONH)	DK	Partner