August, 2023

Final special edition

NEWSLETTER

IMPROVE-PD New frontiers in Peritoneal Dialysis

Empowering a new generation of peritoneal dialysis researchers

IMPROVE-PD is a European consortium funded by the European Union through the Horizon 2020 Programme.

IMPROVE-PD is formed by a consortium of 22 organisations from 9 different countries.

IMPROVE-PD has trained for 40 months 16 PhD students to become multidisciplinary specialists in the area of peritoneal dialysis. The overall duration of the project has been 54 months.

Visit our website www.improvepd.eu

IMPROVE-PD consortium has stimulated the PhD students' entrepreneurship and equipped them with a unique transferable skillset to improve employability. The training received has made the PhD students aware of the real processes and challenges by which basic experimental and clinical data is translated into patient care and newly developed therapies.

THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER THE MARIE SKŁODOWSKA-CURIE GRANT AGREEMENT NO 812699

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WHAT IS IMPROVE-PD

THE NEED

Chronic kidney disease (CKD) afflicts 8% of the European population and increase risks of infections, **cardiovascular disease (CVD)** and death. It might progress to end-stage renal disease, prevalent in 250,000 people in Europe, from infants to geriatrics, that depend on a life-saving renal replacement therapy such as **peritoneal dialysis (PD)**. During PD, a fluid is instilled into the peritoneal cavity so ultrafiltration (UF) and diffusion occur across the peritoneal membrane (PM) to eliminate waste materials and water from the body.

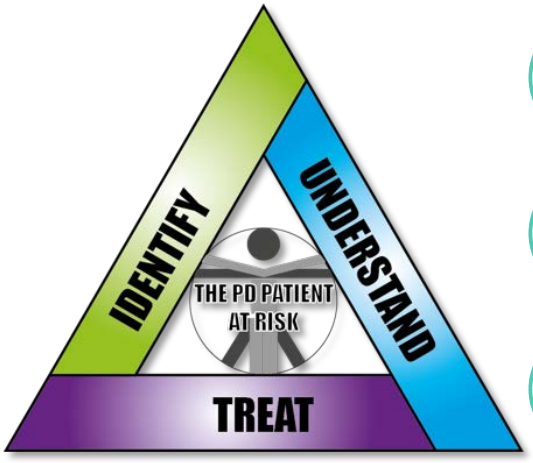
Although PD offers economic and performance benefits over haemodialysis, both therapies accelerate atherosclerosis and CVD.

OUR GOAL

Improved understanding of the molecular mechanisms involved in inflammation, and their connection with CVD will help in the design of interventions to reduce PD-related complications.

A risk-adjusted individualized PD approach is crucial. IMPROVE-PD consortium was born to allow close collaboration between industrial and academic sectors, working in partnership with patients and public to achieve these ambitious targets.

IMPROVE-PD aimed to reduce CVD and mortality in PD patients by enabling tailored approaches targeted to the individual characteristics of the patient.



1. **Identifying the patient at risk who will benefit from individualizing therapy**
2. **Understanding the patient at risk**
3. **Early phase studies of novel anti-inflammatory therapies in PD**

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CONSORTIUM

22 ORGANISATIONS FROM 9 COUNTRIES

<u>COORDINATOR</u>: Agencia Estatal Consejo Superior de Investigaciones Científicas (ES)

BENEFICIARIES	PARTNERS
Cardiff University (UK)	Dutch Kidney Foundation (NL)
Baxter Healthcare (AT)	The European Peritoneal Dialysis Association (UK)
INSERM Nancy Clinical Investigation Centre (FR)	Fresenius Medical Care (DE)
University of Keele (UK)	Kidney Research UK (UK)
Medical University of Vienna (AT)	Delta 4 (AT)
Université Catholique de Louvain (BE)	Servicio Madrileño de Salud-Instituto de Investigación del Hospital Universitario La Paz (ES)
Universitaets-Klinikum Heidelberg (DE)	University of Ghent (BE)
Amsterdam UMC (NL)	Renal Registry UK (UK)
Zytoprotec GmbH (AT)	Australia/New Zealand Renal Registry (AU)
Universidad Autónoma de Madrid (ES)	Poznan University of Medical Science (PL)
	Institut de Recerca Biomèdica de Lleida (ES)

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OUR EARLY STAGE RESEARCHERS

ESR1. Ivan Damgov

ESR2. Iva Marinovic

ESR3. Obaida

ESR4. Madonna Salib

ESR5. Eva Arriero

ESR6. Vanessa Marchant

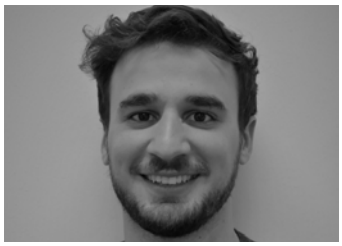
ESR7. Ines Costa

ESR8. Esra Cetin

ESR9. Shrea Roy

ESR10. Jamie Kane

ESR11. Robin Hoogenboom



ESR12. Juan Manuel Sacnun

ESR14. Krystell Oviedo

ESR15. Michail Evgeniou

ESR13. Valeria Kopytina

ESR11. Jitka Láchová

16 Early-Stage Researchers (ESRs) worked in a multidisciplinary pan-European PhD level training programme delivered by leading academic, clinical and industrial stakeholders. Network-wide and training activities, combined with individual projects and secondments provided key skills preparing ESRs as highly skilled researchers.

SUPERVISORS



Agencia Estatal Consejo Superior de Investigaciones Científicas, CSIC (ES)
ESRs 5 & 13. Supervisors:
Manuel López Cabrera, Pilar Sandoval & Guadalupe T. González-Mateo

Universidad Autónoma de Madrid (UAM)
ESR 6. Supervisor:
Marta Ruiz-Ortega


Baxter Healthcare (AT)
ESR 14. Supervisor:
Jacek Lange

Cardiff University (UK)
ESRs 8 & 9. Supervisors:
Anne-Catherine Raby,
Somma Meran &
Donald Fraser




University of Keele (UK)
ESR 3. Supervisors:
Simon Davies & Mark Lambie

INSERM Nancy Clinical Investigation Centre (FR)
ESR 4. Supervisors:
Patrick Rossignol & Sophie Girerd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SUPERVISORS



Amsterdam UMC (NL)
ESR 10. Supervisors:
Marc Vervloet, Etto Eringa,
& Lily Jakulj


Universitaets-Klinikum Heidelberg (DE)
ESRs 1 & 2. Supervisors:
Claus P. Schmitt & Maria Bartosova


Medical University of Vienna (AT)
ESR 15. Supervisors:
Christoph Aufricht & Andreas Vychytil


Zytoprotec GmbH (AT)
ESRs 11 &12. Supervisors:
Klaus Kratochwill & Rebecca Herzog

Université Catholique de Louvain (BE)
ESR 7. Supervisors: Olivier Devuyst

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SCIENTIFIC RESULTS

FINDINGS

Some of the most relevant results obtained are:

- Creation of a platform, IMPROVE-PD Finder, combining key meta-data from dialysis registries, observational and randomized prospective clinical studies, and bio-banks.
- Validation of omics data and molecular mechanisms across health, CKD and PD treatments.
- Test of PD supplemention with Alanyl-Glutamine, demonstrating protective actions.
- Development of novel methodology to investigate the endothelial and epithelial barrier function, integrating functional measurements and junction component studies on single molecule level.
- Analysis to stratify the risk of technique failure and CVD.
- Creation of calculator software to predict endurance in PD.
- Analysis of the mechanisms of local to systemic inflammatory communication, identifying IL17 as a cytokine involved in the PM damage induced by PD fluids, in CVD, and in the CKD-associated inflammation. Several regulatory miRNAs were identified as potential therapies in CKD.
- Amelioration of renal damage by using epigenetic drugs.
- Study of the role of water channels in the structure and function of the PM during PD in relation to fasting, changes in body composition and accumulation of fat.
- Analysis of the effects of a peritoneal infection on the systemic inflammation state and endogenous ligands expression.
- Establishment of a new model of vascular smooth muscle cell to calcification phenotype.
- Study of cytokines altered during PD in relationship with vascular osteogenic gene expression and calcification.
- Study of Extracellular matrix components alterations in cells undergoing vascular osteogenic differentiation.
- Study of the association between inflammatory state induced by PD, CKD and obesity, with the size and vulnerability of atherosclerotic plaques.

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SCIENTIFIC RESULTS

FINDINGS

- Test of an antibody treatment, Anti-Galectin-2, to reduce atherosclerotic plaque size.
- Study of the effect of an additive for PD fluid on the gut microbiome sequencing of human stool samples to expand the human microbiome dataset, supplemented with systemic metabolomics.
- Analysis of the levels of glucose degradation products or osmotic agents that lead stress-related responses, and how cytoprotection can attenuate it.
- Set up of an In vitro system for studying signalling between mesothelial and endothelial cells to study th effect of an additive to the PD fluid
- Lithium addition to PD fluids showed a better preservation of the PM in mice.
- New PD mouse model with CVD and an in vitro chronic exposure model of patient uremic serum to endothelial cells were developed
- Novel osmotic agents' candidates to induce less peritoneal injury - one was patented.
- Assessment of systemic effects of exposure to glucose-based fluids
- A trial was designed to assess relevant outcomes with a novel PD fluid
- A meta-analysis on transcriptomic data related to PD to create a molecular network.
- Identification of drugs not prescribed yet in PD patients affecting biological processes of high significance for PD.

More information on project results:
www.improvepd.eu

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MEETINGS

ACADEMIES AND CONGRESSES

Kick-off meeting in Madrid
Jan. 25th, 2019

1st Academy in Madrid
Sept. 10-13th, 2019

2nd Academy
Cardiff
Feb. 4-7th, 2020

3rd Academy
Vienna, Nov. 16-20th, 2020
Online celebrated: COVID-19 did not stop us!

4th Academy
May 2-6, 2021 ISPD-EuroPD virtual event

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MEETINGS

ACADEMIES AND CONGRESSES

5th Academy
Heidelberg
Sept. 27-October 1, 2021

6th Academy in
Amsterdam
April 4 - 8, 2022

7th Academy
Keele
November 22-25, 2022

Final meeting of the
Supervisory Board
Madrid, May 10th, 2023

Regular Executive Coordination Team monitoring meetings (Project Coordinator, Project Manager and WP leaders)

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ACTION FUNDED BY THE EUROPEAN UNION

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 812699.

IDENTIFY
UNDERSTAND
THE PD PATIENT AT RISK
TREAT

IMPROVE-PD
New frontiers in Peritoneal Dialysis

www.improvepd.eu