

PHILIPPE Cecile, PhD

Department of Biomedical Imaging and Image-guided Therapy, Division of Nuclear Medicine, Medical University of Vienna



Project Title:

Metabolic control of aging and disease – preclinical imaging investigations

Background:

As the continuous increase in human life expectancy is resulting in a larger elderly population with multiple health conditions, promoting healthy aging has become a pressing societal challenge, emphasizing the need for validated strategies to extend the disease-free phase of life, known as the health span.

Our preclinical study aims to investigate metabolic aging under disease and stress conditions using advanced imaging techniques. Positron emission tomography (PET) will be employed for non-invasive in vivo imaging of metabolic functions within the whole body.

Hypothesis and Objectives:

We aim to identify changes in energy metabolism during aging in both healthy and obese animal subjects of both sexes, especially under stress conditions, pharmacological interventions, or dietary measures. Specifically, we will explore how these factors affect metabolic aging and disease progression.

Methodology:

The study will involve animal monitoring via metabolic cages, interventions (dietary measures or drug treatment), longitudinal PET imaging of different animal cohorts using specific radiotracers for energy metabolism and post-processing of the imaging data.

References:

1. López-Otín, C., Galluzzi, L., Freije, J.M.P., Madeo, F., Kroemer, G., 2016. Metabolic Control of Longevity. Cell 166(4):802-821.

2. Wirth, A., Wolf, B., Huang, C.K., Glage, S., Hofer, S.J., Bankstahl, M., Bär, C., Thum, T., Kahl, K.G., Sigrist, S.J., Madeo, F., Bankstahl, J.P., Ponimaskin, E., 2021. Novel aspects of age-protection by spermidine supplementation are associated with preserved telomere length. *Geroscience* 43(2):673-690.
3. Subtirelu, R.C., Teichner, E.M., Su, Y., Al-Daoud, O., Patel, M., Patil, S., Writer, M., Werner, T., Revheim, M.E., Høilund-Carlsen, P.F., Alavi, A., 2023. Aging and Cerebral Glucose Metabolism: 18F-FDG-PET/CT Reveals Distinct Global and Regional Metabolic Changes in Healthy Patients. *Life* 13(10):2044.
4. Ustinau, U., Ehret, V., Fürnsinn, C., Scherer, T., Helbich, T.H., Hacker, M., Krššák, M., Philippe, C., 2023. Novel approach using [18F]FTHA-PET and de novo synthesized VLDL for assessment of FFA metabolism in a rat model of diet induced NAFLD. *Clinical Nutrition* 42 (10): 1839-1848.

Position: PhD – Medical University of Vienna

Requirements: Master degree in a relevant discipline (e.g. biology, pharmacy, nutrition science, veterinary medicine, etc.)

Willingness to carry out preclinical experiments.

Knowledge of imaging devices, especially PET, is preferential.

Motivation to work in an interdisciplinary team.

Excellent communication and teamwork skills.

Language skills: fluent English