

Care4Asthma – Advancing diagnosis and treatment of pediatric asthma by deep immunophenotyping and evaluation of two spacer devices for inhaled corticosteroid administration

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Asthma is one of the most common chronic non-communicable diseases with the highest prevalence reported among children and adolescents¹. Undertreatment due to improper administration techniques and suboptimal compliance of inhaled corticosteroid (ICS) therapy may lead to poor asthma control². Additionally, environmental exposure to chemical pollutants and allergens may play a crucial role in the onset of asthma exacerbation and symptom control, as they affect the immune system possibly leading to chronic inflammation³. The Care4Asthma study aims to improve pediatric asthma management by improving ICS treatment adherence while identifying immune signatures and risk factors associated with asthma control.

180 children with diagnosed asthma aged 5-16 years will be recruited in this multicentric open label randomized controlled and prospective clinical trial. The Whizz spacer is a device designed to improve adherence to ICS therapy and guide inhalation technique through electronic monitoring. Its efficacy will be evaluated and compared to a standard spacer. Treatment response will be longitudinally monitored using pulmonary function tests and asthma questionnaires. Blood and exhaled breath condensate will be collected to investigate immune signatures and to determine clinically applicable biomarkers associated with asthma endotypes and treatment response. Pollutants and allergens will be quantified in hair and house dust samples respectively, to identify risk factors and to improve comprehension and interpretation of exacerbation of asthma symptoms and treatment response.

Care4Asthma will integrate multiple data layers and thereby contribute to a better understanding of factors impacting pediatric asthma, while aiming to improve medical care by advancing treatment compliance.⁴

References

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BIOSKETCH

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CURRENT AND PAST POSITIONS:

I am currently a PhD student in Molecular and Translational Allergology at the Luxembourg Institute of Health (LIH). In my PhD project entitled “Linking early environmental imprinting of the immune system to allergic disease”, I am studying the impact of chemical pollutants on allergy onset in a pediatric population. My PhD project is integrated in the FNR-funded Xpose DTU (PRIDE23/18356118), a doctoral training unit in exposome and health.

Previous positions:

- **Researcher** at the Max Delbrück Center for Molecular Medicine (MDC), Molecular Epidemiology Research Group, Berlin, Germany (09/2024-12/2024)
- **Research Intern (Master thesis)** at the Karolinska Institutet, Department of Biosciences and Nutrition, Eckardt Treuter Lab, Stockholm, Sweden (10/2023-07/2024)
- **Research Intern** at the University of Hawaii Cancer Center, Population Sciences in the Pacific Program, Epidemiology Department, Honolulu, United-States (01/2023-07/2023)
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EDUCATION:

- PhD Student – Doctoral School in Science and Engineering, Doctoral Program in Systems and Molecular Medicine, University of Luxembourg, Luxembourg (since February 2025)
- Master of Science – Nutritional Medicine, University of Lübeck, Germany (July 2024)
- Bachelor of Science – Nutritional Sciences, University of Vienna, Austria (April 2021)

AWARDS AND HONORS:

- Scholarship for academic further education abroad (PROMOS) awarded by the German Academic Exchange Service (Bonn, Germany) for research stay at the University of Hawaii Cancer Center, Honolulu, United-States
- Participation at the London International Youth Science Forum 2015 in London, United Kingdom awarded in the Luxembourgish national *Jonk Fuerscher* contest 2015
- Participation at the 26th European Union Contest for Young Scientists (EUCYS) 2014 in Warsaw, Poland awarded in the Luxembourgish national *Jonk Fuerscher* contest 2014

OTHER RELEVANT PROFESSIONAL ACTIVITIES AND ACCOMPLISHMENTS:

- Author of the German *Ernährungsmedizin Blog* by Prof. Martin Smollich (2022-2023)