EUSTAR Fellowship

Summary Report

Fellow's Name: Daniel Zavada

Host Institution: Policlinico di Milano, Italy

Dates of Fellowship: 01.09.2025-30.11.2025

Supervisor's Name: Chiara Bellocchi M.D., Ph.D.

1. What were the key objectives of your EUSTAR Fellowship, and to what extent were they achieved during your placement?

The primary objective of my EUSTAR Fellowship was to deepen my understanding of the autonomic nervous system, particularly the parasympathetic branch and its role and effects in autoimmune conditions, with a particular focus on systemic sclerosis. I aimed to gain specific expertise in ECG-based indices of autonomic function, through the many facets of heart rate variability (HRV). Another strong objective was to learn about methods of vagus nerve stimulation, particularly transcutaneous vagus nerve stimulation (tVNS). These topics align closely with my scientific focus as a clinician and scientist.

During the fellowship, I achieved these objectives to a large extent, largely thanks to the wonderful mentors I was fortunate to have – Chiara Bellocchi, M.D., Ph.D,. a physician clinical immunologist and Angelica Carandina, MSc. Ph.D., a scientist with expertise in autonomic involvement. I gained practical hands-on experience with autonomic assessment techniques and scientific discovery.

A major component of my fellowship was conducting a systematic literature review focused on effects of tVNS on HRV, which allowed me to gain experience for future investigation under supervision. Through the review we identified a knowledge gap and conducted a clinical study, where I was involved in the planning, securing IRB approval, data measurement, statistical analysis and reporting.

2. How has the Fellowship contributed to your professional development and future career plans in systemic sclerosis research or clinical practice?

The EUSTAR Fellowship contributed substantially to my professional development by refining my research focus and strengthening my expertise in translational autonomic research relevant to autoimmune conditions, in particular systemic sclerosis. Through hands-on involvement I will be able to critically evaluate the methodology, strengths and limitations of these techniques in future projects regarding both research and potential clinical applications.

The fellowship allowed me to develop new competencies in study design, ethical approval process, data acquisition, HRV methodology, and novel methods of statistical analysis. Importantly, this experience confirmed the relevance of the autonomic nervous system and parasympathetic neuromodulation as a potential therapeutic or mechanistic avenue.

In addition, the fellowship enabled the formation of valuable professional networks and ongoing collaborations with the host institution. The research project initiated during my placement is continuing beyond the fellowship period, providing a foundation for future joint publications and further collaborative studies. Overall, the fellowship has had a lasting impact on my career trajectory by integrating autonomic neuroscience more firmly into my future research and clinical practice.

3. What were the most valuable aspects of your hosting institution's environment (e.g., supervision, facilities, team integration)?

The most valuable aspects of my hosting institution's environment were the continuous support from my mentors, as well as their flexibility and openness in adapting their guidance to my learning needs. Supervision was readily available whenever required, while still allowing me sufficient independence to explore. The host team fostered a highly collaborative and inclusive atmosphere, which facilitated smooth integration into the lab. Overall, the balance between strong mentorship and a supportive team environment created an ideal setting for both scientific development and professional growth, and greatly enhanced the value of my fellowship experience.