

Report of Internship at Skandionkliniken, Sweden

This report summarises my training stay at Skandionkliniken, the Swedish National Proton Therapy Centre in Uppsala. The mobility period took place between September 1st and October 17th, 2025, within the framework of my residency training to become a Medical Physicist. The sending institution was Hospital Clínico San Carlos in Madrid, Spain.

The aim of this placement was to gain practical experience in proton therapy, focusing on machine quality assurance (MQA), and to deepen my understanding of the radiobiological and physical differences between photon and proton treatments. The stay offered an excellent opportunity to integrate theoretical knowledge with hands-on clinical experience.

During the first weeks, I reviewed relevant literature, clinical guidelines, and treatment planning principles, building a solid understanding of proton–photon interaction differences. I also participated in weekly and monthly quality assurance tests.

In the following weeks, I participated in patient-specific quality assurance. I also had the opportunity to observe an experimental measurement of stopping power ratios of different samples emulating human tissues and to speak with the developers of the Torbjörn Näsmark algorithm_ which calculates the stopping power ratio from dual-energy and photon-counting CT data. Towards the end of my stay, I helped onboard a new resident and presented a summary of my learning experience to the department. I also attended the PhD defense of Nils Olsson, titled “Respiratory motion management for proton and photon radiation therapy of small lung tumors,” as well as several seminars on the history of proton therapy in Uppsala and ongoing R&D projects at Skandionkliniken.

Throughout this mobility period, I developed technical skills in QA, while also better understanding the clinical and logistical challenges involved in implementing proton therapy within a national healthcare system. I found particularly relevant the need for coordinated patient recruitment across hospitals to ensure equitable access to proton therapy when clinically indicated.

Overall, my stay enhanced my professional competence and confidence as a future medical physicist. I am sincerely thankful to all the staff, particularly the medical physics team, for their kindness and guidance, and to the PIANOFORTE programme for their generous support in making this opportunity possible.