The Experiences of An ERS Fellowship Recipient

The ERS offers Fellowship schemes for professionals actively engaged in clinical and basic research in respiratory medicine and clinical pulmonary practice. These enable doctors and respiratory investigators to carry out research to obtain training in a clinical or research unit in another European Country. This article is the first in a series which will track the experiences of Research Fellows and establish how this funding helped in the development of their career.

Jakub Radlinski
Short-term Training Fellowship
Home country: Poland
Host country: Sweden

How did you become involved in sleep medicine?

I worked as a research assistant in the Institute for Tuberculosis and Lung Disease, Rabka-Zdrój, Poland. I graduated in computer science but I started working in the Pathophysiology Department and became interested in the field of measurements and modelling of respiratory systems. I undertook a PhD in this research field but then I became interested in sleep measurements.

Why did you apply for a Fellowship?

I wanted to extend my knowledge and be able to bring that back to my country. Therefore, I applied to the ERS for a 3-month Research Fellowship to visit Prof. Jan Hedner in the Sleep Laboratory at Sahlgrenska University Hospital, Gothenburg, Sweden. There were two goals in my Fellowship: one education and the second research. The educational goal was to achieve the necessary skills to work with signals obtained during polysomnography and finally to help establish a sleep laboratory in my home country. The research goal was to develop special analysis tools to analyse plethysmographical pulse wave signals obtained from different devices, such as PAT, oximetry probes and PPG.

How did your training progress?

During the first few weeks of my training I was introduced to the sleep laboratory and I was trained in performing polysomnography. The next important stage was learning about the scoring and interpretation of the measurement results. During this time, I took part in a few night measurements and the subsequent scoring sessions.

Where did this lead to?

During the Fellowship my work focused on analysing the whole nights' recordings instead of previous attempts to analyse only time windows related to sleep disorder events. In agreement with previous papers, we focused on the algorithm to detect and characterise attenuations of interesting signals. During the Fellowship, we developed software to analyse the attenuation of plethysmographical pulse wave signals and began analysing a few different cohorts of previously recorded signals.

What software techniques did you use?

We extensively used the scientific environment Scilab (an open-source alternative to MatLab) for the primary development, but we also took into consideration the possibility of integrating our software into Somnologica software, which is used in Sahlgrenska University Hospital. We also decided to extend the software, making it flexible so it could process other similar signals.

Do you feel you have achieved a lot from the Fellowship?

Definitely, my Fellowship was extremely fruitful. I gained knowledge that allowed me to start a sleep laboratory at my home institution immediately after my return. This was the first laboratory with full polysomnography in South East Poland. The research results were also important: using developed tools we proved that the dynamics of plethysmographical signals roughly estimated by attenuation patterns contains not only about sleep disorder events but also information about the cardiovascular status of the individual.

I was also able to extend my knowledge in this area as I returned to Gothenburg in the autumn of 2005 for another year. During this visit we focused on the dynamics of cardiovascular related signals including ECG and plethysmographic pulse wave, and we started using more sophisticated tools from nonlinear domains, such as entropies or fractal dimensions. These results are still under evaluation and I am still involved in work that is related to Gothenburg.

Not all of my time was spent in the laboratory; my host institute also arranged visits to ResMed and Breas who produce medical equipment (*e.g.* CPAP) and cooperate with the sleep laboratory.