

Trainee Matters

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The European School of Interdisciplinary Tinnitus

Scientific careers in tinnitus are expanding beyond any single discipline to embrace interdisciplinary collaboration and knowledge exchange. **Natalia Trpchevska** and **Christopher R Cederroth** present an overview of an innovative EU-funded training programme called the ‘European School of Interdisciplinary Tinnitus’, and briefly outline the first training school that took place recently in Warsaw, Poland.

Tinnitus remains a clinical enigma. Defined as a symptom accompanying a large number of diseases or disorders, tinnitus has received little attention and, as a consequence, its understanding, its measures, and its treatment have made little progress - until recently. Knowledge on the pathophysiology of tinnitus has increased tremendously during the last decade and innovative interventions have emerged, albeit with mixed success. It is thought that the underlying grounds to such failures are the heterogeneity of tinnitus and its complexity, involving multiple organs and a variety of environmental risk factors and aetiologies. Yet, in spite of an increasing interest in this condition, a large number of doctors face tinnitus patients without a clear view on how to tackle the problem. The European landscape resembles a kaleidoscope without any clear pattern on opinions, guidelines, methodologies and care. The field needs a turn of mind, possibly through the collision of multiple fields and approaches - this may be a way to sow the seeds of new ideas, and generate new knowledge.

European Union network funding from Cooperation in Science and Technology (COST) Actions (www.cost.eu) led to the creation of TINNET (tinnnet.tinnitusresearch.net)

in 2014, uniting 30 EU countries to standardise clinical assessment methods and treatments, develop international databases, protocols for neuroimaging, biobanks for genetic studies, and international consensus-based outcome measures. From TINNET, the European School of Interdisciplinary Tinnitus Research (ESIT) was born in the spring of 2017, supported by the Marie Skłodowska Curie International Training Network grant. In ESIT, 12 universities from 10 EU member states and 34 other academic and non-academic partners have joined to educate the next generation of tinnitus researchers beyond ENT and audiology with inputs from engineering, information technology, genetics, epidemiology, psychology, and neurology. Such an unconventional approach in auditory neuroscience is predicted to provide a large impact, not only from an educational perspective, but also in the research output with clear benefits to patient care [1]. Here, we briefly summarise the first training school held in Warsaw, Poland, during which our PhD students made acquaintance for the first time and met some of the leaders and supervisors for establishing the ground knowledge to build their research projects on. (See Figure 1 for a brief introduction of the ESIT students and their projects.)

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Figure 1. Presentation of the projects the ESIT students will be working on. The structure of ESIT is composed such that all leaders originate from different backgrounds, often outside the traditional audiological approach, which underlines the interdisciplinary approach towards tinnitus research. PhD students 1 and 2 (top left) will be dedicated to integrate and analyse a large-scale clinical data in order to guide clinicians towards a personalised treatment. PhD students 3, 4, and 5 (top right) will determine by means of epidemiological studies and genetic approaches the risk factors for the development of tinnitus. PhD students 6 and 7 (middle row, left) will be working towards developing a new software framework that will provide researchers with innovative and reliable tools for the collection of data and physiological parameters as well as creating an innovative sensor application with signal processing that will generate information for precision healthcare and lifestyle monitoring. PhD students 8 to 15 will improve existing treatment approaches and tailor them to patients in order to optimise treatment success. For instance, they will develop individual tomographic neurofeedback protocols and optimise strategies for cochlear electro stimulation. The different perspectives on the same problem is expected to provide new insights into the complex tinnitus puzzle.

1st ESIT training school

One cold and snowy week in November 2017, 15 newly recruited ESIT PhD students, three additional PhD students working on tinnitus and 10 ESIT faculty members were invited to Warsaw, Poland, to participate in the 1st ESIT training school hosted by Dr Marzena Mielczarek (Medical University of Lodz) (see Figure 2). This one-week residential programme gave participants the opportunity to learn what ESIT is all about, hear about what skills and competencies are important to become an independent researcher, participate in team building activities and listen to introductory lectures giving a fundamental grounding in key principles and theories in tinnitus science including:

- The cellular and molecular basis of hearing: The Organ of Corti
- The genetics of hearing loss
- Large-scale brain networks in tinnitus
- The peripheral and central auditory system
- Revealing tinnitus in the animal model
- Aetiology of tinnitus
- The psychoacoustics of tinnitus
- Clinical history taking and ontological examination in tinnitus
- Measuring the subjective perception of tinnitus
- Patient-reported measures of tinnitus
- The psychology of tinnitus
- Tinnitus treatments: concepts and reality
- Guidelines, policies and insurance rules affecting tinnitus diagnosis and management.
- Frameworks for subtyping
- National clinical guidelines and policies



Figure 2. Students and teachers at the 1st ESIT training school in Warsaw, November 2017.

On the Wednesday, an interactive session to stimulate critical evaluation of the tinnitus care pathway in different European countries was organised and facilitated by invited faculty members (see Figure 3): Dr Raj Shekhawat, lecturer in Population Health University of Auckland, New Zealand, and Mr David Stockdale, Chief Executive of the British Tinnitus Association, UK. On Thursday, there were twilight workshops from Dr Shekhawat and Prof Deborah Hall, University of Nottingham, UK, on their career journeys. This week started an exciting journey of personal growth and development with hopes to create solid professional bonds and relationships. Feedback from the students included:

- “The first ESIT training school was an amazing experience. Getting to know all the students and supervisors was very fruitful and promising for future collaboration.”
- “Thank you for the really inspiring twilight workshops!”



Figure 3. Workshop session with Dr Raj Shekhawat and Dr Marzena Mielczarek at the 1st ESIT training school in Warsaw, November 2017.

Expected deliverables at the end of ESIT and the future

With hopes to improve the care of those with tinnitus, PhD students will be able to understand individual differences in tinnitus and integrate knowledge from all relevant clinical and scientific disciplines thanks to their involvement in the ESIT training programme. Working together with experts in the field, ESIT students will contribute to the development of individualised treatment solutions by integrating state-of-the-art technological innovations. At the end of the four years funding period, it is expected that the PhD students will deliver: the genetic and environmental risk factors causing tinnitus; the factors affecting the responsiveness to treatment; a guide for personalised treatment, for instance personalised cochlear implants and hearing aids, tailored cognitive behavioural therapy; and innovative software programs for monitoring tinnitus and associated lifestyle characteristics. The coming years promise to be very exciting! It is also hoped that the curriculum the students are going through now may become a reference for future higher education on tinnitus.

Forthcoming ESIT events

ESIT events are not only open to ESIT students, but also to other PhD students who want to gain benefit by joining these unique learning opportunities, and for whom a limited number of places are available. In 2018, ESIT will be holding a satellite event to the 11th TRI/2nd TINNET conference, which will be running 12-13 March 2018 in Regensburg, Germany (<http://2018.tri-conf.org/>). Visit us at the 'ESIT corner' during the conference, which takes place 14-16 March! The 2nd ESIT training school will take place on 10-15 September 2018 in Nottingham UK. To find out more about how you can join any of these events, please email dawn.hazle@nottingham.ac.uk.

Follow us on social media

ESIT disseminates regularly on its website (<https://esit.tinnitusresearch.net/>) Facebook (www.facebook.com/ESITProject/) and Twitter (<https://twitter.com/ESITProject/>). Don't hesitate to follow us to get the most recent updates on research activities, training schools, events and courses!

Reference

- Schlee W, Hall, D A, Canlon B, et al. Innovations in Doctoral Training and Research on Tinnitus: The European School of Interdisciplinary Tinnitus Research (ESIT) *Perspective. Frontiers in Aging Neuroscience* 2017;**9**:447.

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