

## **PerStim: personalized neurostimulation for non-invasive epilepsy treatment**

### **Short summary**

Neurostimulation is a promising treatment method for patients with epilepsy, of whom approximately 30 percent still suffer from seizures, in spite of medication. Based on a novel EEG-based non-invasive neurostimulation system, we investigate how we can effectively personalize treatments for patients with focal epilepsy.

### **Public summary**

By using non-invasive neurostimulation, specifically transcutaneous direct/alternating current stimulation (tDCS/tACS), we hypothesize that focal epilepsy can be treated with focal stimulation. Eindhoven University of Technology has teamed up with Philips Electronics Nederland B.V. and the Academic Centre for Epilepsy Kempenhaeghe to investigate this hypothesis and to develop personalized neurostimulation. The collaboration project is co-funded by the PPP Allowance made available by Health~Holland, Top Sector Life Sciences & Health to Epilepsiefonds to stimulate public-private partnerships. Epilepsiefonds endorses the project.

Epilepsy is the most common neurological disorder, affecting approximately 120.000 patients in the Netherlands. The impact of epilepsy is substantial and broad: in addition to seizures, it may cause cognitive problems and psychological complaints, and has negative socio-economic consequences, which puts a heavy burden on individual health and quality of life as well as on society. Often seizures are hard to treat using traditional methods (medication, resection).

In the recent years, neurostimulation has received increasing clinical attention as a treatment method for neurological disorders. In this project, we investigate a non-invasive neurostimulation technique which provides only a small burden for patients, namely tDCS/tACS based on a high-density EEG system. With this system, we aim to determine personalized treatment protocols.

A tight technical-clinical cooperation and integration of the obtained results in clinical trials will allow for direct testing of the hypothesis. The overall deliverable of the project is to develop personalized non-invasive neurostimulation protocols to provide refractory (and also non-refractory) epilepsy patients better quality of life.