

Developing Human Brain Stimulation: New Treatments, New Products

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Introduction

Human brain stimulation has many uses in basic research but there has been a failure to translate basic findings into deliverable treatments. In collaboration with my industrial partner I have developed a deliverable treatment for tinnitus. In western Europe, 18 million people suffer from tinnitus. What we know is that some tinnitus sufferers have lower levels of certain kinds of brain activity, known as oscillations, at specific frequencies. By using Transcranial Alternating Current Stimulation we have been able to increase the necessary activity.

In most studies, patients are given one dose of treatment (and things sometimes work for a few minutes). We have given intensive brain stimulation treatments over a period of 4 weeks and the patients receiving the critical frequency have measurable and subjectively appreciable improvements (none wanted to stop the experiment!). We are following the improvements over longer periods and currently have evidence for benefits lasting for several months. In the barren landscape of treatments for tinnitus, this is a major advance,

The machines for this treatment are currently cumbersome, expensive and have interfaces designed by engineers for engineers (they are lousy). With my industrial partner, Magstim, we have designed a new brain stimulator, with new capabilities, an elegant design and an interface usable by any patient. It is also cheaper but not yet affordable by many individuals. The problem is a simple one of scale. Demand from patients will reduce the cost.

Delivering new treatments.

Brain stimulation is not like drugs. Doctors cannot send a patient home with two weeks supply of brain stimulation. The brain stimulation companies are small and cannot put pharma-like muscle behind developments. We therefore need to find new ways of making treatments available to patients. Again with my industrial partner, Magstim, we have embarked upon brain stimulation clinics for depression. This requires delivering training programmes for psychiatrists, advertising the availability of the treatment to patients and overcoming a great deal of conservatism.

We will be showcasing the new product and our treatments at the Magstim Neuroenhancement Conference in Oxford, May 2013.

My Industry Research Fellowship is based at The Magstim Company, Whitland Wales. Through this secondment I have been able to develop a product and a new treatment protocol and we are currently developing new clinics for depression. Without it I wouldn't have the time and freedom to develop the protocols and products nor the face validity to convince business and industrial colleagues that some of these things are possible.

