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## Development of feedback-controlled neuromodulation strategies for the treatment of intractable repetitive hyperkinetic movement disorders (RD_aDBS).

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Tourette syndrome is characterized by a combination of motor and vocal tics. Many Tourette-patients are or become refractory to current treatments or suffer side-effects severe enough to necessitate discontinuation of treatment. Deep brain stimulation (DBS) has shown promise in the treatment of some challenging patients. "Conventional" continuous DBS, however, poorly matches the temporal presentation of symptoms and accordingly it may be ineffective and associated with stimulation-induced side effects. The future of DBS entails targeted modulation of only those brain regions implicated in the disease at only those times the symptoms are imminent or manifest. The RD_aDBS project seeks to unravel the underlying pathology of Tourette to facilitate the development of a more effective, targeted DBS. It is designed to identify electrical brain signals which indicate or predict the onset of tics. As such, the project studies electrical and behavioral phenomena arising in animals with the specific brain abnormalities implicated in Tourette syndrome and compares them with the electrophysiological measurements of the nearest equivalent data recorded from human patients undergoing DBS treatment. The resulting translational database will be used to detect the onset of tics, enabling the development of a DBS device that interfaces directly with the brain region in which symptoms originate in order to suppress tics in a timely manner.