

Live Demonstration: Implantable Stimulator for Epileptic Seizure Suppression with Loading Impedance Adaptability

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ABSTRACT

An implantable stimulator for epileptic seizure suppression with loading impedance adaptability [1] is demonstrated in the Conference. The stimulator consisted of a high voltage generator, an output driver, an adaptor, and switches, has been integrated in a silicon chip. The fabricated chip of the stimulator has been applied to a closed-loop epileptic seizure monitoring and controlling system [2] for animal test. The measurement setup with the equipments is shown in Fig. 1. The implantable stimulator with Long-Evans rat is shown in Fig. 2. All these experimental procedures have been reviewed and approved by Institutional Animal Care and Use Committee of National Cheng Kung University, Taiwan.

The implantable stimulator to suppress the epileptic seizure of the Long-Evans rat will be demonstrated in the Conference. The electroencephalography (EEG) signals of the Long-Evans rat without and with applying the stimulation is presented in the Conference, as shown in Fig. 3. In Fig. 3(a), the epileptic discharges are observed during 3.5~12 s. When the seizure controller is applied in Fig. 3(b), the seizure is detected during 3.5~5.5 s. Upon the detection of the seizure, the intensive and rapidly brain activities are suppressed by the stimulation.

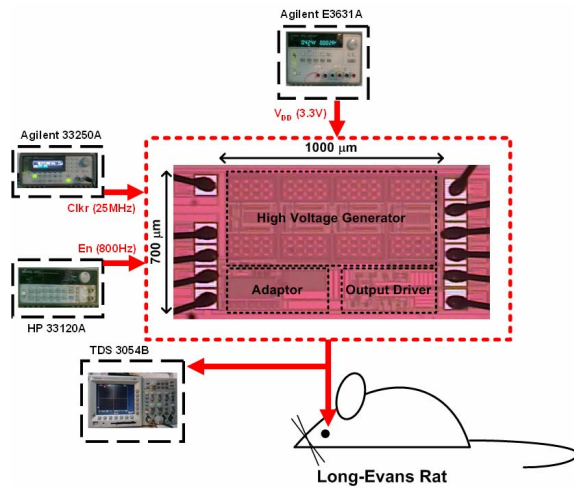


Fig. 1. Measurement setup with on-chip implantable stimulator.

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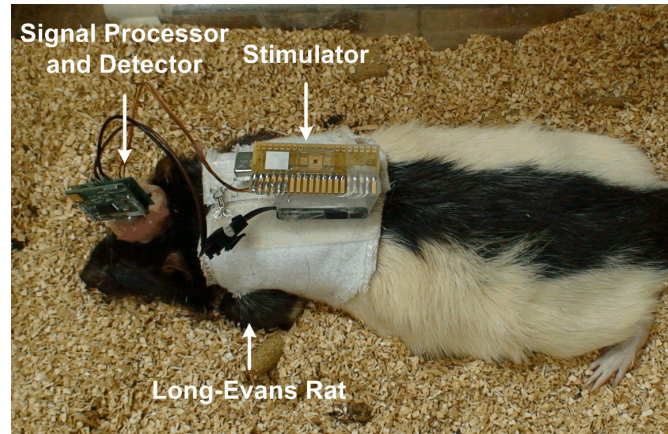


Fig. 2. Animal test.

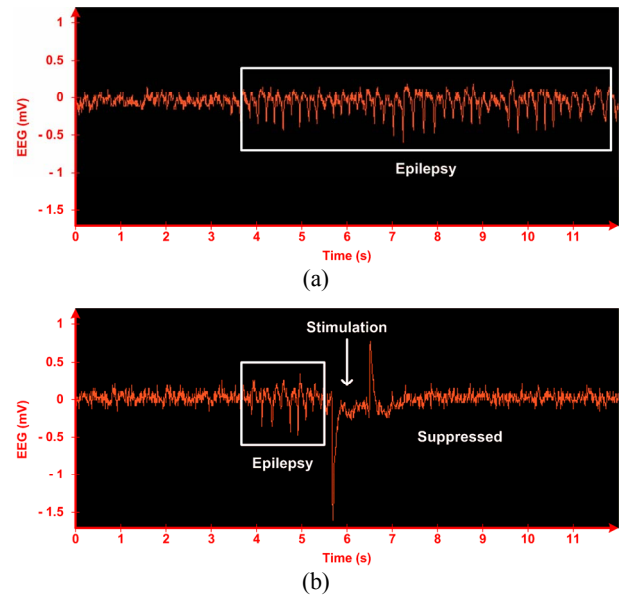


Fig. 3. Experimental results on EEG signals of Long-Evans rat.

REFERENCES

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