PhD project: **Flexible electronics for advanced healthcare applications**

The Phan research group at UNSW (https://www.phan-lab.com/) is looking for highly motivated and talented PhD candidates to work on Bio Micro ElectroMechanical Systems (Bio-MEMS). In particular, the project aims to employ advanced materials such as mesoporous materials and wide bandgap semiconductors to develop a new class of long-term implanted bioelectronics for health care applications. Different from the traditional biomedical devices, the new platforms are designed with mechanical flexibility that well matches with that of biotissue, and long-term stability that allows the devices to operate in human body for several decades. The use of these implanted electronics will enable real-time monitoring of chronical disease as well as timely treatment through in vivo electrical stimulation. Candidates with a background in one of the following areas: electrical, mechanical, material engineering, and applied physics are highly preferred.

The candidates will have opportunities to collaborate with chemists and biologists to deploy their devices in *in vitro* (i.e., organ on chips) and *in vivo* (i.e., animal models) biological systems. The students will receive training in cutting-edge nanofabrication technologies at the Australian National Fabrication Facility-UNSW node, opportunity to work for a short-term overseas research internship for period of up to 2 months (at renowned institutions such as Stanford University with Prof. Debbie G. Senesky, Northwestern University with Prof. John A. Rogers, The University of Tokyo with Prof. Toshihiro Itoh, who are long-standing collaborator with the Phan lab).

For further information, please contact Dr. Phan at hp.phan@unsw.edu.au

Related papers from Phan research group:

1. H.-P. Phan, Y. Zhong, T.-K. Nguyen, Y. Park, T. Dinh, E. Song, R.K. Vadivelu, M. K. Masud, J. Li, M.J.A. Shiddiky, D.V. Dao, Y. Yamauchi, J. A. Rogers, and N.-T. Nguyen, Long-lived, transferred crystalline silicon carbide nanomembranes for implantable flexible electronics, ***ACS Nano***, 13, 10, 11572-11581, 2019.

2. T.-A. Pham, T.-K. Nguyen, R.K. Vadivelu, T. Dinh, A. Qamar, S. Yadav, Y. Yamauchi, J.A. Rogers, N.-T. Nguyen, H.-P. Phan*, A Versatile Sacrificial Layer for Transfer Printing of Wide Bandgap Materials for Implantable and Stretchable Bioelectronics, ***Advanced Functional Materials***, 30(43), 2004655, 2020.

3. T. Nagaura,* H.-P. Phan,* V. Malgras, T.-A. Pham, H. Lim, A. Ashok, J. Kim, J. You, N.-T. Nguyen, J. Na, Y. Yamauchi, Universal Electrochemical Synthesis of Mesoporous Chalcogenide Semiconductors: Mesoporous CdSe and CdTe Thin Films for Optoelectronic Applications, ***Angewandte Chemie International Edition***, 60(17), 9660, 2021.

4. V.-T. Nguyen, T. Dinh, A.R. Md Foisal, H.-P. Phan, T.-K. Nguyen, N.-T. Nguyen, and V.D. Dao, Giant piezoresistive effect by optoelectronic coupling in a heterojunction, ***Nature Communications***, 10, 4139, 2019.

5. T.-K. Nguyen, M. Barton, A. Ashok, T.-A. Truong, S. Yadav, M. Leitch, T.-V. Nguyen, N. Kashaninejad, T. Dinh, L. Hold, Y. Yamauchi, N.-T. Nguyen, H.-P. Phan, Wide bandgap semiconductor nanomembranes as a long-term bio-interface for flexible, implanted neuromodulator, ***The Proceedings of the National Academy of Sciences*** (***PNAS***), 2022. *In press.* DOI: https://orcid.org/0000-0003-0479-0348