Opportunity available for TWO(2) NTU-IPP(ESG) PhD studentships in Materials Science and Engineering

Title: NTU-IPP(ESG) PhD in Materials Science and Engineering – Development of novel sorbent materials with application in next generation wearable kidney devices

Introduction: This a fully-funded 4-year PhD studentship supervised jointly by School of Materials Science and Engineering, NTU and AWAK Technologies Pte Ltd (AWAK), as part of the ESG-IPP (Enterprise Singapore – Industrial Postgraduate Programme) initiative. Trainees will be provided with postgraduate training in both university and corporate R&D environment through this research partnership. Successful applicants will be full-time salaried employees of AWAK while pursuing full-time PhD studies at NTU. The research topic for this PhD studentship will focus on the development of novel sorbent materials with applications in next generation of wearable kidney dialysis devices (wearable kidney). Candidates are expected to conduct research on AWAK-NTU identified research topic and spend 100% of their time on this project (supervised by a team comprising 1 academic faculty from NTU and 1 company staff) at both NTU and AWAK facilities.

Project background: Currently, there are 7,500 patients with end-stage kidney disease (ESKD) on dialysis in Singapore and 3 million patients worldwide, who are required to undergo routine in-centre dialysis treatment at great cost and inconvenience. The extreme lifestyle disruption imposed by existing treatment modalities has led to a growing interest in wearable kidneys. Sorbents and related materials are playing an important role in achieving the miniaturisation of bulky dialysis systems to create portable products for home dialysis, as well as in achieving the ultimate goal of a wearable kidney. The objective of this project will be to investigate novel materials with improved properties over contemporary sorbents, including selective removal of uremic toxins and enhanced management of electrolyte and acid-base homeostasis. By the end of the PhD candidates can expect to be well trained in materials synthesis and characterisation techniques and have a firm understanding of how this is applied in sorbent dialysis, getting the best of academic research and industrial insight.

Eligibility: We are looking for two candidates who are interested a career in medical device development, and are motivated to apply their R&D skills towards solving real-world problems in the dialysis field. Students from a materials science, bioengineering or chemistry background are encouraged to apply. Preferred skills include: characterisation techniques such as XRD and electron microscopy and materials synthesis. This role would suit candidates that are self-motivated and have an ability to critically analyse their work, building theoretical concepts into a commercially viable solution. Applicants to ESG-IPP are required to be a Singapore Citizen or Permanent Resident in order to be eligible.

About research partners: NTU Materials Science and Engineering has been ranked number 1 globally for both 2019 and 2018 in the category of materials science, based U.S. News Best Global Universities Ranking of top 750 universities. Within the NTU research group, the nanomaterials team is currently made up of three postdocs and two other PhD students working on a variety of application projects. AWAK Technologies is a Singapore-based medical device innovator, and has been working on innovative products in the dialysis industry for over 12 years. AWAK has successfully developed and evaluated a miniaturised sorbent-based wearable peritoneal dialysis machine (AWAK PD) on 15 patients at Singapore General Hospital. This First-in-Human study was the first and largest trial undertaken for a sorbent-based PD device; based on this progress AWAK PD was awarded Breakthrough Device Designation by the US FDA.

Interested candidates are invited to send their application to the email below. Please submit your detailed resume, sample research publications (if any), names and contacts (including email addresses) of 2 referees and a cover letter explaining why you are suitable for this position.

Contact:
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