

Dr. Patricia Vazquez

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ACADEMIC EXPERIENCE

Senior Researcher

University of Galway | 2019 – 2025

- Development of miniaturised wireless implantable sensors for cardiovascular applications and AI integration for personalized healthcare, in collaboration with industry and academia.
- Supervised 3 postdocs, 1 PhD, and 5 MSc students in biomedical device development and AI-enabled monitoring.

Postdoctoral Researcher

Tyndall National Institute, Ireland | 2011 – 2018

- Coordinated the Irish contribution to an H2020 Horizon project focused on novel MEMS system for small industry partners.
- Technical lead in SFI-funded National Access Programme, developing micro/nanoscale platforms for point-of-care diagnostics and supporting national research initiatives.
- Contributed to organizing international conferences and workshops, including Microneedles 2014 and the Smart System Integration Conference 2017 (Cork).

FUNDING

- Enterprise Ireland's Commercialization Fund - secured €156,781 to develop a neuromodulation device for urinary incontinence.
- Secured €5,000 for the study of ultrasound characterisation of cervical tissue, to develop an ultrasound system for early detection of Preterm birth.
- Supervised a group of students (1 PhD, 1 BSc, 3 Erasmus) with diverse backgrounds.

PhD SUPERVISION

Dr. Shifa Felemban, PhD. (co-supervised, UCC, 2015-2020) – Portable electrochemical system for detection of environmental pollutants.

PUBLICATIONS

Iqbal, T., Masud, M., Amin, B., Feely, C., Faherty, M., Jones, T., Tierney, M., Shahzad, A. and Vazquez, P., 2024. Towards integration of artificial intelligence into medical devices as a real-time recommender system for personalised healthcare: State-of-the-art and future prospects. *Health Sciences Review*, p.100150.

<https://www.sciencedirect.com/science/article/pii/S2772632024000035>

Farooq, M., ur Rehman, M.R., Vazquez, P., Wijns, W., Shahzad, A. and Krašný, M.J., 2024. Open-source controller for dynamic cardiovascular models. *HardwareX*, 17, p.e00500.

<https://www.sciencedirect.com/science/article/pii/S2468067223001074>

Amin, B., Rehman, M.R.U., Farooq, M., Elahi, A., Donaghey, K., Wijns, W., Shahzad, A. and Vazquez, P., 2023. Optimizing cardiac wireless implant communication: A feasibility study on selecting the frequency and matching medium. *Sensors*, 23(7), p.3411.

<https://www.mdpi.com/1424-8220/23/7/3411>

Masud, M., Vazquez, P., Rehman, M.R.U., Elahi, A., Wijns, W. and Shahzad, A., 2023. Measurement techniques and challenges of wireless LC resonant sensors: a review. *IEEE Access*, 11, pp.95235-95252.

<https://ieeexplore.ieee.org/abstract/document/10232998>

Felemban, S., Vazquez, P., Balbaied, T. and Moore, E., 2022. Lab-on-a-chip electrochemical immunosensor array integrated with microfluidics: Development and characterisation. *Electrochem*, 3(4), pp.570-580. <https://www.mdpi.com/2673-3293/3/4/39>

Iqbal, T., Elahi, A., Redon, P., Vazquez, P., Wijns, W. and Shahzad, A., 2021. A review of biophysiological and biochemical indicators of stress for connected and preventive healthcare. *Diagnostics*, 11(3), p.556. <https://www.mdpi.com/2075-4418/11/3/556>

Farooq, M., Iqbal, T., Vazquez, P., Farid, N., Thampi, S., Wijns, W. and Shahzad, A., 2020. Thin-film flexible wireless pressure sensor for continuous pressure monitoring in medical applications. *Sensors*, 20(22), p.6653.

Manavi, T., Vazquez, P., O'Grady, H., Martina, J., Rose, M., Nielsen, D., Fitzpatrick, D., Forouzan, O., Nagy, M., Sharif, F. and Zafar, H., 2020. A novel wireless implant for central

venous pressure measurement: First animal experience. *Cardiovascular Digital Health Journal*, 1(3), pp.130-138.

<https://www.sciencedirect.com/science/article/pii/S2666693620300554>

Manavi, T., Vazquez, P., Tubassam, M., Zafar, J., Sharif, F. and Zafar, H., 2020. Determination of optimal implantation site in central venous system for wireless hemodynamic monitoring. *IJC Heart & Vasculature*, 27, p.100510.

<https://www.sciencedirect.com/science/article/pii/S2352906720300634>

Felemban, S., Vazquez, P. and Moore, E., 2019. Future trends for in situ monitoring of polycyclic aromatic hydrocarbons in water sources: The role of immunosensing techniques. *Biosensors*, 9(4), p.142. <https://www.mdpi.com/2079-6374/9/4/142>

Vazquez, P., Herzog, G., O'Mahony, C., O'Brien, J., Scully, J., Blake, A., O'Mathuna, C. and Galvin, P., 2014. Microscopic gel-liquid interfaces supported by hollow microneedle array for voltammetric drug detection. *Sensors and Actuators B: Chemical*, 201, pp.572-578.

<https://www.sciencedirect.com/science/article/pii/S0925400514004912>

Vazquez, P., O'Mahony, C., O'Brien, J., Scully, J., Blake, A., O'Mathuna, C., Galvin, P. and Herzog, G., 2014, November. Microneedle sensor for voltammetric drug detection in physiological fluids. In *SENSORS, 2014 IEEE* (pp. 1768-1771). IEEE.

<https://ieeexplore.ieee.org/abstract/document/6985367>

Twomey, K., O'Mara, P., Pulka, J., McGillicuddy, S., Hurley, E., Blake, A., Vazquez, P., Vereshchagina, E., Manning, M., Homsy, A. and Glynn, B., 2015. Fabrication and characterization of a test platform integrating nanoporous structures with biochemical functionality. *IEEE Sensors Journal*, 15(8), pp.4329-4337.

<https://ieeexplore.ieee.org/abstract/document/7027781>

Dimaki, M., Vazquez, P., Aimone, A., Olsen, M.H., Sasso, L., Rodriguez-Trujillo, R. and Svendsen, W.E., 2012. Novel 3d microelectrodes and pipettes by wet and dry etching. *Microelectronic engineering*, 100, pp.33-36.

<https://www.sciencedirect.com/science/article/pii/S0167931712004182>

"Fabrication and Characterization of 3D Micro- and Nanoelectrodes for Neuron Recordings". M. Dimaki, P. Vazquez, M. H. Olsen, L. Sasso, R. Rodriguez-Trujillo, I. Vedarethinam, W. E. Svendsen. *Sensors* 2011, 10(11), 10339-10355.

<https://www.mdpi.com/1424-8220/10/11/10339>

Vazquez, P., Dimaki, M. and Svendsen, W.E., 2011, October. Scalloped electrodes for highly sensitive electrical measurements. In *SENSORS, 2011 IEEE* (pp. 1584-1587). IEEE.

“Conducting polymer 3D microelectrodes”. L. Sasso, P. Vazquez, J. Castillo-Leon, J. Emneus, W.E. Svendsen, *Sensors* 2010. <https://www.mdpi.com/1424-8220/10/12/10986>

“Three dimensional electrochemical system for neurobiological studies”. Vazquez, P., Dimaki, M., & Svendsen, W. E. 2009 Annual International Conference of the IEEE Engineering in Medicine and Biology Society (pp. 5870-5874). IEEE. <https://ieeexplore.ieee.org/abstract/document/5334443>

“Metallization of high aspect ratio, out of plane structures”. Vazquez, P., Dimaki, M., & Svendsen, W. E. 3rd International Workshop on Advances in sensors and Interfaces (pp. 193-196). IEEE, 2009.