

PROFESSIONAL SKILLS

Analytical Chemistry

Biotechnology

Smart Materials

Commercialisation

PATENTS

Sensor Device for Odorant Sensing NZ Patent Application (NZ727745) 2017

Conducting Polymers and Uses Thereof NZ Patent Application (NZ724050) 2016

Methods and Apparatus for Amplifying Nucleic Acids US Patent. US 14/738,179 (Tech ID 32827, AJP ref 788399) 2015

REFERENCES

Jadranka Travas-Sejdic
Professor, UOA
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Esma Sezer
Professor, Istanbul Technical University
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Andrew Kralicek
Team Leader, Plant & Food Research Ltd.
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NIHAN AYDEMIR

Assistant Professor

GEBZE TECHNICAL UNIVERSITY,

<https://scholar.google.com/citations?user=toZNM5YAAAAJ&hl=en>

naydemir@gtu.edu.tr

EDUCATION

- 2012 **Doctor of Philosophy (PhD)** in Chemical Sciences,
2016 Conducting polymers for label-free electrochemical DNA sensors.
UNIVERSITY OF AUCKLAND (UOA), Auckland, New Zealand
- 2017 **Masters of Commercialisation & Entrepreneurship (MCE)**
2019 **UNIVERSITY OF AUCKLAND (UOA)** Auckland, New Zealand
- 2009 **Masters of Science (MS)** in Polymer Science and Technology.
2012 **ISTANBUL TECHNICAL UNIVERSITY**, Istanbul, Turkey
- 2001 **Bachelor of Science (BSc)** in Chemistry,
2009 **ISTANBUL TECHNICAL UNIVERSITY**, Istanbul, Turkey

EXPERIENCE

- Present **Assistant Professor,**
2020 **GEBZE TECHNICAL UNIVERSITY**, Kocaeli Turkey,
Currently working towards building a research group that focuses on the nano fabrication of smart materials and stretchable electronics to be utilised in medical applications and biosensors.
- 2020 **Post-Doctoral Research Associate,**
2017 **PLANT & FOOD RESEARCH LTD**, Auckland, New Zealand
Prototype development and investigation of the volatile sensing mechanisms on gold electrodes upon functionalisation with membrane proteins which are embedded in nano-discs and nano-liposomes.
- 2017 **Post-Doctoral Research Associate,**
2016 **UNIVERSITY OF AUCKLAND**, Auckland, New Zealand
Development of miniaturised biosensors for very rapid identification and diagnostics of infectious and non-communicable diseases in real samples, where a characteristic DNA signature is present.
- 2012 **PhD Candidate,**
2016 **UNIVERSITY OF AUCKLAND**, Auckland, New Zealand
Nano/micro fabrication of conducting polymers and their applications as label-free, electrochemical, highly sensitive and selective biosensors and actuators.

LIST OF PUBLICATIONS

- 1 Investigating Electrochemical Stability and Reliability of Gold Electrode-Electrolyte Systems to Develop Bioelectronic Nose Using Insect Olfactory Receptor. *Electroanalysis* 31 (4), 726-738. (2019)
R Khadka, **N Aydemir**, C Carraher, C Hamiaux, P Baek, J Cheema, Andrew Kralicek, Jadranka Travas-Sejdic
- 2 An ultrasensitive electrochemical impedance-based biosensor using insect odorant receptors to detect odorants. *Biosensors and Bioelectronics* 126, 207-213 (2019)
R Khadka, **N Aydemir**, C Carraher, C Hamiaux, D Colbert, J Cheema, Jenny Malmström, Andrew Kralicek, Jadranka Travas-Sejdic
- 3 Data on preparation and characterization of an insect odorant receptor based biosensor. *Data in brief* 21, 2142-2148 (2018)
R Khadka, **N Aydemir**, C Carraher, C Hamiaux, D Colbert, J Cheema, Jenny Malmström, Andrew Kralicek, Jadranka Travas-Sejdic
- 4 Chain shape and thin film behaviour of poly (thiophene)-graft-poly (acrylate urethane). *Soft matter*, 2018,14, 6875-6882. (2018)
P Baek, J Mata, A Sokolova, A Nelson, **N Aydemir**, R Shahlori, Duncan James McGillivray, David Barker, Jadranka Travas-Sejdic
- 5 Direct Writing and Characterization of Three-Dimensional Conducting Polymer PEDOT Arrays. *ACS applied materials & interfaces* 10 (14), 11888-11895. (2018)
P Zhang, **N Aydemir**, M Alkaisi, DE Williams, J Travas-Sejdic
- 6 Molecularly Engineered Intrinsically Healable and Stretchable Conducting Polymers, *Chemistry of Materials*, DOI: 10.1021/acs.chemmater.7b03291. (2018)
P Baek, **N Aydemir**, Y An, E W Chan, A Sokolova, A Nelson, J P Mata, D McGillivray, D Barker, and J Travas-Sejdic
- 7 Conducting electrospun brushes with polyanionic grafts as highly selective, label-free, electrochemical biosensor with a low detection limit for non-Hodgkin lymphoma gene, *Biosensors and Bioelectronics*, Volume 100, 2018, Pages 549-555, (2018)
T E. Kerr-Phillips, **N Aydemir**, E W Chan, D Barker, J Malmström, C Plesse, J Travas-Sejdic
- 8 New immobilisation method for oligonucleotides on electrodes enables highly-sensitive, electrochemical label-free gene sensing, *Biosensors and Bioelectronics* 97, 128-135. (2017)
N Aydemir, E Chan, P Baek, D Barker, DE Williams, J Travas-Sejdic
- 9 Direct laser scribed graphene/PVDF-HFP composite electrodes with improved mechanical water wear and their electrochemistry, *Applied Materials Today* 8, 35-43 (2017)
G Xu, **N Aydemir**, PA Kilmartin, J Travas-Sejdic
- 10 Enhanced Capacitive Energy Storage in PolyoxometalateDoped Polypyrrole, *Advanced Functional Materials*. (2017)
S Herrmann, **N Aydemir**, F Nägele, D Fantauzzi, T Jacob, Jadranka TravasSejdic, Carsten Streb
- 11 Polymer electronic composites that heal by solvent vapour, *RSC Advances* 6 (100), 98466-98474. (2016)
P Baek, **N Aydemir**, OJ Chaudhary, EWC Chan, J Malmstrom, T Giney, R Khadka, D Barker, J Travas-Sejdic
- 12 Conducting polymer based electrochemical biosensors, *Physical Chemistry Chemical Physics* 18 (12), 8264-8277. (2016)
N Aydemir, J Malmström, J Travas-Sejdic

LIST OF PUBLICATIONS

- 12 Electrolyte and solvent effects in PPy/DBS linear actuators, *Sensors and Actuators B: Chemical* 216, 24-32. (2015)
N Aydemir, PA Kilmartin, J Travas-Sejdic, A Kesküla, AL Peikolainen, J Parcell, M Harjo, A Aabloo, R Kiefer
- 13 A Label-free, sensitive, real-time, semiquantitative electrochemical measurement method for DNA polymerase. (2015)
amplification (ePCR), *Analytical chemistry* 87 (10), 5189-5197
N Aydemir, H McArdle, S Patel, W Whitford, CW Evans, J Travas-Sejdic, D.E Williams
- 14 Bio-inspired flow sensor from printed PEDOT: PSS micro-hairs, *Bioinspiration & biomimetics* 10 (1), 016017. (2015)
H Devaraj, J Travas-Sejdic, R Sharma, **N Aydemir**, D Williams, E Haemmerle, K.C Aw
- 15 Carbide-derived carbon as active interlayer of polypyrrole tri-layer linear actuator, *Sensors and Actuators B: Chemical* 201, 100-106. (2014)
R Kiefer, **N Aydemir**, J Torop, T Tamm, R Temmer, J Travas-Sejdic, I Must, F Kaasik, A Aabloo
- 16 Electrochemistry of interlayer supported polypyrrole tri-layer linear actuators, *Electrochimica Acta* 122, 322-328. (2014)
R Kiefer, R Temmer, **N Aydemir**, J Travas-Sejdic, A Aabloo, T Tamm
- 17 Carbide-derived carbon (CDC) linear actuator properties in combination with conducting polymers,
SPIE Smart Structures and Materials+ Nondestructive Evaluation and Health Monitoring Pages 90561V-90561V-7. (2014)
R Kiefer, **N Aydemir**, J Torop, PA Kilmartin, T Tamm, F Kaasik, A Kesküla, J Travas-Sejdic, A Aabloo
- 18 Electrochemomechanical deformation (ECMD) of PPyDBS in free standing Im formation and trilayer designs,
SPIE Smart Structures and Materials+ Nondestructive Evaluation and Health Monitoring Pages 905631-905631-8. (2014)
N Aydemir, T Tamm, J Travas-Sejdic, PA Kilmartin, A Aabloo, R Kiefer
- 19 Intrinsically conducting polymer nanowires for biosensing, *Journal of Materials Chemistry B* 2 (29), 4593-4609. (2014)
J Travas-Sejdic, **N Aydemir**, B Kannan, DE Williams, J Malmström
- 20 A novel air flow sensor from printed PEDOT micro-hairs, *Smart Materials and Structures* 22 (11), 112001. (2013)
J Parcell, **N Aydemir**, H Devaraj, J Travas-Sejdic, DE Williams, KC Aw
- 21 *Macromol. Rapid Commun.* 16/2013, *Macromolecular rapid communications* 34 (16), 1336-1336 (Cover Picture) (2013)
N Aydemir, J Parcell, C Laslau, M Nieuwoudt, DE Williams, J Travas-Sejdic
- 22 Direct writing of conducting polymers, *Macromolecular rapid communications* 34 (16), 1296-1300. (2013)
N Aydemir, J Parcell, C Laslau, M Nieuwoudt, DE Williams, J Travas-Sejdic
- 23 A new precursor for conducting polymer-based brush interfaces with electroactivity in aqueous solution, *Polymer* 54 (4), 1305-1317. (2013)
LT Strover, J Malmström, O Laita, J Reynisson, **N Aydemir**, MK Nieuwoudt, DE Williams, PR Dunbar, MA Brimble, J Travas-Sejdic

AWARDS, GRANTS, SCHOLARSHIPS

- 1 **Scholarship:** Recipient of MBA Scholarship from MacDiarmid Institute for the completion of Masters of Commercialisation and Entrepreneurship (2018).
- 2 **Award & Grant:** Winner of 2016 Velocity 100k Challenge with “SpotCheck”, University of Auckland Entrepreneurship Programme (2016)
(Amongst more than 300 applicants).
- 3 **Grant:** Food and Health programme Seed Funding: Development of a Label-Free Biosensor for Detecting the Bacterial Contamination in Food Samples (2016)
- 4 **Award:** Commercial Ideas Prize Winner- Spark Ideas Challenge with “Real Time PCR Detection”,
University of Auckland Entrepreneurship Programme (2015).
- 5 **Award:** University of Auckland Uni-Services Special Prize Winner of Spark Ideas Challenge with "Smart Skin" Project, University of Auckland Entrepreneurship Programme (2015).
- 6 **Scholarship:** PhD Scholarship. Polymer Electronics Research Centre (2015).
- 7 **Award:** Best Poster- 7th Advance Materials and Nanotechnology Conference, Highly commended top 5 list. (2014)
for the excellence in student poster presentation.
- 8 **Award:** Best Poster- Revolution Fibers Award for Science Creativity. 10th MacDiarmid Student and Postdoc Symposium. (2014)
- 9 **Award:** Spark Ideas Challenge Commercialization Prize 2014 Winner- MicroPoly, Conducting polymer 3D micro/nano structures for highly sensitive DNA sensors. (2014)
- 10 **Award:** Best Poster- MacDiarmid Advanced Materials and Nanotechnology Institute special prize University of Auckland 5th Annual Chemistry Department Showcase 2013.
- 11 **Award:** Best Poster- University of Auckland 5th Annual Chemistry Department Showcase 2013- Second year students Best Poster-Runner-up
- 12 **Scholarship:** PhD Scholarship. Callahan Innovation. (2012)

PUBLIC REACH & MEDIA COVARAGE

<http://www.cie.auckland.ac.nz/newsroom/artmid/20949/articleid/559/spot-check-secures-further-investment-for-its-point-of-care-medical-testing-device>

<http://www.sharechat.co.nz/article/bdabc614/diagnostic-tool-for-infectious-and-chronic-disease-detection-wins-velocity-challenge.html>




<http://www.scoop.co.nz/stories/BU1610/S00653/diagnostic-tool-wins-velocity-challenge.htm>

<http://www.voxy.co.nz/business/5/266121>

<https://www.facebook.com/SCS.at.UoA/photos/congratulations-to-nihan-aydemir-eddie-chan-jennifer-barnes-david-barker-david-w/1789353927990320/>

<https://macdiarmid.ac.nz/nihan-aydemir-alumni-video/>

TEACHING EXPERIENCE

- 2021  **Asist. Prof, NANO 512**, Advanced Nano fabrication techniques included but not limited to the lithography, etching, thin film deposition and diffusion. (For Masters and PhD)
GEBZE TECHNICAL UNIVERSITY, Kocaeli, Turkey
- 2019  **Lecturer, PHARM 211 (1 module)**, Analytical techniques used in pharmacy such as FTIR, UV-VIS, AAS and Fluorescent Spectroscopy. (For Bachelors degree , 2nd year)
UNIVERSITY OF AUCKLAND, Auckland, New Zealand
- 2018  **Lecturer, CHEM 780, (1 module)** Conducting polymer based advanced materials and devices, including synthesis, conduction mechanisms and structural characterisation using spectroscopic techniques. (For Post-Graduate Level)
UNIVERSITY OF AUCKLAND, Auckland, New Zealand

TEACHING PHILOSOPHY STATEMENT

OBJECTIVES

We live in the era of information whereby both critical and analytical thinking are amongst of the most valuable skills as most of the hand labour can be done autonomously by robots. World needs problem solvers, innovators, solution architects and etc. I believe, science and/or engineering education can be an amazing opportunity to obtain such skills. Hence, my main objective is to teach students how to approach or understand an existing condition/ problem and then how to analyse and improve/solve it by using the available information. Finally, if relevant, I wish to guide them how to extract the new information from the process that they have been through.

METHODOLOGY

Achieving the objectives mentioned above requires a highly motivated class which can be achieved in an interactive environment. Also, the reasoning and functioning behind the given information is crucially important. For instance, when I start a subject, I always spend a couple of minutes to address the real life applications and then start talking about the theoretical knowledge. In terms of the theory, I like using a variety of resources including but not limited to text books, scientific publications, industry reports and etc. Upon transferring the theory, I always provide examples that we analyse and solve with students. If possible, I invite them to the lab in small groups and perform hands on experiments together. Also, I like organising field trips where students can get familiar with the field and working environment. Finally, I assign them a task, usually solving a problem that involves

- 1) Analysing the problem
- 2) Conducting research to find the relevant information and examples in literature
- 3) Devising a strategy and reaching a solution if possible.
- 4) Presenting the findings in appropriate formats.