

CURRICULUM VITAE

ADEL ALHALAWANI, Ph.D., P.Eng.

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EDUCATION

Doctor of Philosophy (Ph.D.), Ryerson University, Canada

Sept. 2013 - Major: **Mechanical Engineering** | CGPA: 3.90/4.33
Dec. 2016 Field of Research: Biomaterials and Biomechanics
Advisor: Dr. Mark Towler

Master of Engineering Science (M.Sc.Eng.), University of Malaya, Malaysia

Sept. 2012 - Major: **Biomedical Engineering** | Dissertation-Based Degree
Aug. 2013 Field of Research: Biomaterials and Tissue Engineering
Advisors: Dr. Mark Towler and Dr. Belinda Murphy

Bachelor of Engineering (B.Eng.), Mehran University of Engineering and Technology, Pakistan

Jan. 2006 - Major: **Biomedical Engineering** | CGPA: 3.52/4.00
Jan. 2010 Advisor: Dr. Kehkashan Memon

EMPLOYMENT

University of Akron, Akron, United States

Aug. 2019- **Assistant Professor of Engineering Instruction- Biomedical Engineering**

Ryerson University, Toronto, Canada

Jan. 2017 - **Post-Doctoral Fellow**
Aug. 2019

May 2016 – **Sessional Instructor**
Aug. 2019

Sept. 2013 – **Graduate Research & Teaching Assistant**
Dec. 2016

Bradford Institute for Private Training, Kuwait City, Kuwait

Oct. 2011 - **Instructor & Quality Assurance Manager**
Aug. 2012

IFRAD for Research and Development, Amman, Jordan

Feb. 2010 - **Research & Development Engineer**
Aug. 2011

TEACHING EXPERIENCE _____

Sessional Instructor, Ryerson University, Toronto, Canada

Spring 2016 - **Introduction to Biomedical Engineering (BME100)**
Aug. 2019

Fall 2018 **Radiation Therapy Devices (BME704)**

Winter 2019 **Biomedical Systems Modelling (BME809/BE8104)**

Teaching Assistant, Ryerson University, Toronto, Canada

Winter 2014 - **Introduction to Biomedical Engineering (BME100)**
Spring 2018

Winter 2014 - **Biomaterials (BME423)**
2016

Fall 2013 - **Statics and Mechanics of Materials (BME/MEC323)**
Spring 2016

Fall 2015 **Sensors, Measurements and Instruments (MEC751)**

HONORS AND AWARDS _____

2017 **The Ryerson Gold Medal**
Nominated by the Dean of the Engineering Faculty at Ryerson University

2017 **Ph.D. Completion Award- C\$ 10k**
Awarded by Ryerson University for completing the Ph.D. program in less than four years

2016 **Dr. Jacob and Helen Friedman Research Excellence Award- C\$ 2.5k**
Awarded by Ryerson University for research excellence and leadership

2016 **Graduate Seminar Award- C\$ 500**
Awarded for research excellence and presentation skills

- 2015-2017 **International Conference and Research Support Fund-** C\$ 1.7k
Awarded by Ryerson University
- 2014-2015 **International Student & Access to Opportunity Program-** C\$ 21k
Awarded by Ryerson University
- 2013 **Mechanical Engineer Graduate & Ryerson Graduate Award-** C\$ 11k
Awarded by Ryerson University

PROFESSIONAL AFFILIATIONS AND SERVICES

Professional Organization Member

Professional Engineers Ontario (PEO)
Jordan Engineers Association (JEA)

Mentor & Advisor

The Ontario Foundation for Student Science and Technology (2017-Present)
Toronto, Canada

MENTORSHIP

PH.D. STUDENTS

- 2018 - **Amatulraheem Abdullah**
2019 *Finite Element Analysis of Open-Heart Surgery and Sternum Fixation*
- 2018 - **Varinder Sidhu**
2019 *Impact Analysis of Glass-Based Cements*
- 2018 - **Faizan Bilwani**
2019 *Fracture Toughness of Glass-Based Cements*
- 2017 - **Leyla Hasandoost**
2019 *Glass-Based Knee Augments*
- 2017 - **Malvika Nagrath**
2019 *Electrospun Mesoporous Glasses for Dental Applications*

MASTER STUDENTS

- 2018 - **Daniella Marx**
2019 *Biological Effects of Glass-Based Materials on Bone Modelling*
- 2018 - **Emily Deignan**
2019 *In-vivo Implantation of Bioglass-Based Adhesives in Sheep*

- 2018 - **Sunjeev Phull**
2019 *Effect of Gallium-Containing Tantalum Bioactive Glasses on Cancer Treatment*
- 2017 - **MD Saidur Rahman**
2018 *Sol-Gel Bioglasses for Hemostatic Applications*
- 2017 - **Andrew Mendonca**
2018 *Tantalum-Containing Sol-Gel Bioglasses for Hemostatic Applications*
- 2016 - **Cina Mehrvar**
2018 *Glass Polyalkenoate Cements for Orthopedic Applications*

UNDERGRADUATE STUDENTS

- 2018 **Deanna Polintan & Michael Shulman**
pH and Ion Release Evaluation of Glass Polyalkenoate Cements
- 2017 **Adam Zalzal & Jamshied Shamlou**
Mechanical Evaluation of Glass-Based Cements on Cadaveric Bones
- 2016 **Sunjeev Phull, Prushodhj Niranjani, Isaac Beniluz & Bharath Krishnan**
Injectable Glass Polyalkenoate Cements: Evaluation of Their Rheological and Mechanical Properties with and without the Incorporation of Lidocaine Hydrochloride
- 2015 **Cina Mehrvar**
Comparative Study of Weibull Characteristic Strength and Mean Strength of GPCs to Confirm the Minimum Number of Samples Needed for Confident Strength Reporting

FUNDING

Applications I **co-authored** and played an instrumental role in writing and preparing for submission

GRANTED

- 2018 - **Development of a Proprietary, Glass-Based Adhesive for Sternal Fixation and Stabilization.** C\$ 602,438 (PI: Dr. Mark Towler, co-PIs: Drs. Gideon Cohen, Marcello Papini, Oleg Safir and Mark Hurtig), Canadian Institutes of Health Research (CIHR)
- 2018 - **Optimization of a Device for the Storage, Mixing and Delivery of Sterilized Bone Adhesive.** C\$ 119,950 (PI: Dr. Mark Towler, co-PIs: Key Wang, and Drs. Oleg Safir and Paul Zalzal), Natural Sciences and Engineering Research Council of Canada (NSERC)
- 2018 **Inductively Coupled Plasma – Optical Emission Spectroscopy Requisition.** (PI: Dr. Mark Towler), NSERC Research Tools and Instruments (RTI)

CERTIFICATES/ PROFESSIONAL DEVELOPMENT

Ryerson University, Toronto, Canada

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| 2018 | University Teaching Development Program |
| 2018 | Instructional Skills Workshop |
| 2018 | Future Smart: Essential Professional Skills |

PATENTS

Towler, M.R. and **Alhalawani, A.** Glasses, Cements and Uses Thereof. PCT/CA2017/050854
(Filed: July 14, 2017). <https://patents.google.com/patent/WO2018014120A1>

PUBLICATIONS

PEER-REVIEWED JOURNAL ARTICLES

- Nagrath, M.; **Alhalawani, A.**; Yazdi, A.R.; Towler, M.R. (2019). Bioactive glass fiber fabrication via a combination of sol-gel process with electro-spinning technique, *Mater. Sci. Eng. C. Mater. Biol. Appl.* 101, 521.
- Mendonca, A.; Rahman, MS.; **Alhalawani, A.**; Rodriguez, O.; Gallant, RC.; Ni, H.; Clarkin, O.; Towler, M.R. (2019). The Effect of Tantalum Incorporation on the Physical and Chemical Properties of Ternary Silicon–Calcium–Phosphorous Mesoporous Bioactive Glasses. *J. Biomed. Mater. Res. B Appl. Biomater.*, 9999B:9999B:1–9.
- Mehrvar, C.; Kuzyk, P.; Cohen, G.; Safir, O.; Zalzal, P.; **Alhalawani, A.**; Towler, M.R.; Papini, M. (2019). Novel Adhesives for Sternal Fixation and Stabilization: A Biomechanical Analysis. *Clin. Biomech.*, 62, 66-71.
- Mehrvar, C.; Kuzyk, P.; Shamlou, J.; Safir, O.; Zalzal, P.; **Alhalawani, A.**; Towler, M.R.; Papini, M. (2019). Novel Adhesives for Distal Radius Fixation: A Biomechanical Analysis. *J. Mech. Behav. Biomed. Mater.*, 89, 99-106.
- Rahman, S.; Mendonca, A.; **Alhalawani, A.**; Polintan, D.; Clarkin, O.; Towler, M.R. (2018). The Effect of Calcination Rate on the Structure of Mesoporous Bioactive Glasses, *J. Solgel. Sci. Technol.*, 1-10.
- Arshad, S.; Rodriguez, O.; **Alhalawani, A.**; Towler, M.R. (2018). Rapidly-Dissolving Silver-Containing Bioactive Glasses for Cariostatic Applications, *J. Funct. Biomater.*, 9, 28.
- Zalzal, P.; Safir, O.; **Alhalawani, A.**; Papini, M.; and Towler, M.R. (2018). Percutaneous Upper Extremity Fracture Fixation Using a Novel Glass-Based Adhesive, *J. Orthop.*, 15, 67-69.

Niranjan, P.; **Alhalawani, A.**; Phull, S.; Beniluz, I.; Bharath, K.; Zalzal, P.; and Towler, M.R. (2018). Injectable Glass Polyalkenoate Cements: Evaluation of Their Rheological and Mechanical Properties with and without the Incorporation of Lidocaine Hydrochloride, *Biomed. Phys. Eng. Express*, 4, 027002.

Alhalawani, A.; Mehrvar, C.; Stone, W.; Waldman, S.D.; and Towler, M.R. (2017). A Novel Tantalum-Containing Bioglass. Part II. Development of a Bioadhesive for Sternal Fixation and Repair, *Mater. Sci. Eng. C. Mater. Biol. Appl.*, 71, 401-411.

Alhalawani, A.; and Towler, M.R. (2017). A Novel Tantalum-Containing Bioglass. Part I. Structure and Solubility, *Mater. Sci. Eng. C. Mater. Biol. Appl.*, 72, 202-211.

Alhalawani, A.; and Towler, M.R. (2016). The Effect of ZnO→Ta₂O₅ Substitution on the Structural and Thermal Properties of SiO₂-ZnO-SrO-CaO-P₂O₅ Glasses, *Mater. Charact.*, 114, 218-224.

Alhalawani, A.; Curran, D.J.; Boyd, D.; and Towler, M.R. (2015). The Role of Poly(Acrylic Acid) in Conventional Glass Polyalkenoate Cements: A Review of the Literature, *J. poly. Eng.*, 36, 221-237.

Alhalawani, A.; Rodriguez, O.; Curran, D.J.; Co, R.; Kieran, S.; Arshad, S.; Keenan, T.J.; Wren, A.W.; Crasto, G.; Peel, S.A.F.; and Towler, M.R. (2015). A Glass Polyalkenoate Cement Carrier for Bone Morphogenetic Proteins, *J. Mater. Sci. Mater. Med.*, 26, 151.

Mehrvar, C.; Curran, D.J.; **Alhalawani, A.**; Boyd, D.; and Towler, M.R. (2015). Comparative Study of Weibull Characteristic Strength and Mean Strength of GPCs to Confirm the Minimum Number of Samples Needed for Confident Strength Reporting, *J. Mech. Behav. Biomed. Mater.*, 43, 53-58.

Alhalawani, A.; Placek, L.; Wren, A.W.; Curran, D.J.; Boyd, D.; and Towler, M.R. (2014). Influence of Gallium on the Surface Properties of Zinc Based Glass Polyalkenoate Cements, *Mater. Chem. Phys.*, 147, 360-364.

Alhalawani, A.; Curran, D.J.; Pinguan-Murphy, B.; Boyd, D.; and Towler, M.R. (2013). A Novel Glass Polyalkenoate Cement for Fixation and Stabilisation of the Ribcage, Post Sternotomy Surgery: An *Ex-Vivo* Study, *J. Funct. Biomater.*, 4, 329-357.

Alhalawani, A.; and Towler, M.R. (2013). A Review of Sternal Closure Techniques, *J. Biomater. Appl.*, 28, 483-497.

MANUSCRIPTS IN PREPARATION/SUBMITTED FOR REVIEW

Hasandoost, L.; Rodriguez, O.; **Alhalawani, A.**; Zalzal, P.; Schemitsch, E.; Waldman, S.; Papini, M.; Grant, I.; Towler, M.R. (In Preparation). The Role of Poly(methyl methacrylate) in Management of Bone Loss and Bone Infection in Revision Total Knee Arthroplasty: A Review

CONFERENCE PRESENTATIONS

TALKS

Alhalawani, A.; and Towler, M.R. (2018). Antibacterial and Cytotoxic Activities of Novel Tantalum-Containing Glass Polyalkenoate Cements, *42nd International Conference and Exposition on Advanced Ceramics and Composites*, Orlando, FL.

Alhalawani, A.; and Towler, M.R. (2017). The Use of Novel Glass-Based Adhesives for Orthopedic Applications, *BIT's 3rd Annual World Congress of Smart Materials*, Bangkok, Thailand.

POSTERS

Alhalawani, A. and Towler, M.R. (2017). The Structural Role of Ta₂O₅ in SiO₂-CaO-ZnO-SrO-P₂O₅ Glasses, *12th Pacific Rim Conference on Ceramic and Glass Technology*; Hawaii, HI.

Alhalawani, A.; Curran, D.J.; Timothy, T.J.; Wren, A.W.; Boyd, D.; and Towler, M.R. (2016). A Fourier Transform Infrared Spectroscopic Study of Tantalum-Containing Silicate Bio-Glasses, *10th World Biomaterials Congress*; Montreal, QC.

Alhalawani, A.; Rodriguez, O.; Curran, D.J.; Co, R.; Kieran, S.; Arshad, S.; Keenan, T.J.; Wren, A.W.; Crasto, G.; Peel, S.A.F.; and Towler, M.R. (2015). A Glass Polyalkenoate Cement Carrier for Bone Morphogenetic Proteins, *BMES 2015 Annual Meeting*; Tampa, FL.

Alhalawani, A.; Curran, D.J.; and Towler, M.R. (2015). Structural Analysis of Gallium Based Glass Polyalkenoate Cements by Infrared Spectroscopy, *Society for Biomaterials 2015 Annual Meeting*; Charlotte, NC.

Alhalawani, A.; Curran, D.J.; and Towler, M.R. (2014). Influence of Gallium Incorporation on Wettability of Glass Polyalkenoate Cements, *BMES 2014 Annual Meeting*; San Antonio, TX.

Alhalawani, A.; Curran, D.J.; and Towler, M.R. (2014). Gallium Based Cements for Sternal Fixation, *Society for Biomaterials 2014 Annual Meeting*; Denver, CO.