

# Mirit Sharabi

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## CURRICULUM VITAE

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### ACADEMIC APPOINTMENTS

10/2018-present **Lecturer** Head of the Laboratory of Bio-inspired and Complex Materials Mechanics (BCMM), Department of mechanical engineering and Mechatronics, Ariel University, Israel.

2/2018-10/2018 **Postdoctoral Fellow**. Department of materials and interfaces, Weizmann institute, Israel.

Adviser: Prof. Daniel Wagner

7/2017-2/2018 **Postdoctoral Fellow**. School of Mechanical Engineering, Tel-Aviv University, Israel.

Adviser: Dr. Ayelet Lesman

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### EDUCATION

2013-2018 **Ph.D.**, Material Science and Engineering, Tel-Aviv University, Israel.

Thesis: "Novel bio-composite materials and constructs based on unique collagen fibers for soft tissue bio-mimetics".

Advisers: Prof. Rami Haj-Ali and Prof. Dafna Benayahu.

2010-2013 **M.Sc.**, Nanotechnology and Material Engineering, Tel-Aviv University, Israel.

Thesis: "Novel bio-composite material system from marine long collagen fibers: design, fabrication and mechanical characterization".

Advisers: Prof. Rami Haj-Ali R. and Prof. Abdussalam Azem.

2004-2008 **B.Sc.**, Biotechnology engineering, Ben Gurion University of the Negev, Israel.

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### TEACHING APPOINTMENTS

2018-2019 **Lecturer**. Department of mechanical engineering and Mechatronics, Ariel University, Israel.

Courses (undergraduate level):

- Introduction to Materials Engineering
- Advance laboratory in mechanical engineering

2015-2016 **Teaching Assistant.** School of Mechanical Engineering, Tel-Aviv University, Israel.

Courses (undergraduate level):

- Engineering Materials Laboratory
- Introduction to Materials Science and Engineering
- Introduction to Materials Science and Engineering Laboratory

#### ADDITIONAL TEACHING EXPERIENCE

2017 "Novel bio-composite materials and constructs based on unique collagen fibers for soft tissue bio-mimetics"- Seminar for chemical engineering, SCE College of Engineering, Ashdod, Israel.

2017 "Novel bio-composite materials and constructs based on unique collagen fibers for soft tissue bio-mimetics" in practical aspects in biomaterials science course. Afeka- Tel Aviv Academic College of Engineering, Tel Aviv, Israel.

2015 "Novel bio-composite materials and constructs for soft tissue bio-mimetics" in Cellular and tissue engineering for biomedical engineering course- visitor lecture. Tel Aviv University, Tel Aviv, Israel.

Scientific lectures for school students as Noar Shocher Mada, high school and elementary school

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#### INDUSTRIAL ENGINEERING EXPERIENCE

2010-2013 R&D Engineer in bio-diagnostics ImmunArray, Rehovot, Israel.

2008-2010 R&D Engineer at Nulens, Herzeliya, Israel

2007-2008 QA at Lycord LTD, Beer Sheva, Israel.

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#### ACADEMIC RESEARCH AND DEVELOPMENT ACTIVITIES

2013-2017 Developing novel soft bio-composite materials for soft tissue repair (3 peer-reviewed papers).

10/2016 Biomechanics of the intervertebral disc, Ulm, Germany (2 submitted papers).

2015-2017 Kamin Project- Non-Destructive Piezoresistive Testing Devices for Self-Health Damage Monitoring of Composite Structures (Tel-Aviv University).

2011-2012 Developing Molecular Controlled Semiconductor Resistor (MOCSER) as a Platform for High Throughput Screening of Blood (Cooperation between Immunarray to Weizmann institute).

- 2008 Developing PNA Field effect transistor based biosensor (Bursary program, Julich, Germany).
- 2007-2008 Developing Biochip for simultaneous detection of several pathogens (Ben Gurion University).

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## AWARDS

- 2017 ICNB 2017-Best presentation award for the presentation:"novel bio-composite materials and constructs based on unique collagen fibers for soft tissue bio-mimetics", Amsterdam, Netherlands.
- 2017 Travel scholarship for an international conference, Ministry of science, technology and space, Israel
- 2016 Travel scholarship for an international conference, Ministry of science, technology and space, Israel
- 2014 COMPO-2014- Best Poster Award for the poster "A new class of bio-composite materials with soft-coral long collagen fibers"
- 2004 Outstanding undergraduate student award

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## PUBLICATIONS

### PEER REVIEWED PAPERS

1. Sopher R. S, Tokash H., Natan S., **Sharabi M.**, Shelah O., Tchaicheeyan O, and Lesman A., Nonlinear elasticity of the extracellular matrix fibers facilitates efficient inter-cellular mechanical communication. *Biophysical journal* (2018), 115 (7), 1357-1370.
2. **Sharabi M.**, Levi-Sasson A., Wolfson R., Wade K. R, Galbusera R, Benayahu D., Wilke H-J. and Haj-Ali R. The mechanical role of the radial fibers network within the annulus fibrosus of the lumbar intervertebral disc: a finite elements study. *Journal of Biomechanical Engineering* (2018), doi:10.1115/1.4041769.
3. **Sharabi M.**, Wade K. R., Galbusera F., Rasche V., Haj-Ali R. and Wilke H-J. Three-dimensional microstructural reconstruction of the intervertebral disc using ultra-high field MRI. *The spine journal* (2018).  
<https://doi.org/10.1016/j.spinee.2018.06.356>
4. Benayahu D., **Sharabi M.**, Pomeraniec L., Awad L. Haj-Ali R. and Benayahu Y., Unique collagen fibers for biomedical applications. *Marine drugs Journal* (2018), 16(4), 102.
5. **Sharabi M.**, Varssano D., Eliasy R., Benayahu Y., Benayahu D., and Haj-Ali R., Mechanical flexure behavior of bio-inspired collagen-reinforced thin composites (2016), *Composite Structures*, 153, 392-400.

6. **Sharabi M.**, Benayahu D., Benayahu Y., Issacs J., and Haj-Ali R., Laminated Collagen-based bio-composites for tailor designed soft tissue mimetics. *Composites Science and Technology* (2015), 117, 268-276.
7. **Sharabi M.**, Mandelberg Y., Benayahu D., Benayahu Y., Azem A. and Haj-Ali R., A new class of bio-composite materials of unique collagen fibers. *Journal of the mechanical behavior of biomedical materials* (2014), 36, 71-81.

#### BOOK CHAPTERS

1. **Sharabi M.** Wilke H-J. and Haj-Ali R., Chapter 5: Vertebral bone. In: *Biomechanics of the Spine*. pp. 71-87, Editors Hans-Joachim Wilke and Fabio Galbusera, Elsevier (2018), <https://doi.org/10.1016/C2016-0-04439-X>.
2. **Sharabi M.** Wade K. R. and Haj-Ali R., Chapter 7: The role of collagen fibers. In: *Biomechanics of the Spine*. pp. 105-123, Editors Hans-Joachim Wilke and Fabio Galbusera, Elsevier. (2018), <https://doi.org/10.1016/C2016-0-04439-X>

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#### PATENTS

1. Haj-Ali R., Benayahu Y., Benayahu D., Sason-Levi A., **Sharabi M.** Composites comprising collagen extracted from sarcophyton sp. Coral US9821089B2, US Grant (2017)
2. Haj-Ali R., Benayahu Y., Benayahu D., Sason-Levi A., **Sharabi M.** Composites comprising collagen extracted from sarcophyton sp. Coral EP2812039B1, EP Grant (2018)

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#### PROFESSIONAL ACTIVITIES

##### MANUSCRIPTS REVIEWER

Since 2017 European Spine Journal.

##### POSITIONS IN CONFERENCES

Chair. Israel Society for Medical and Biological Engineering (ISMBE 2018), Haifa, Israel, 2018.

Chair. European Society of Biomechanics (ESB 2017), Seville, Spain, 2017.

##### MEMBERSHIP IN PROFESSIONAL/SCIENTIFIC SOCIETIES

European Society of Biomechanics (ESB)

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#### PRESENTATIONS IN CONFERENCES

##### CONFERENCE TALKS

1. **Sharabi M.**, Benayahu D., and Haj-Ali R. "Novel bio-composite materials and constructs based on unique collagen fibers for soft tissue bio-mimetics", International Conference on Nanomaterials and Biomaterials (ICNB 2017), Amsterdam, Netherlands, 2017.

2. **Sharabi M.**, Benayahu D., and Haj-Ali R. "Long collagen fibers reinforced bio-composites for tailor-designed mechanical behavior of soft tissues". European Society of Biomechanics (ESB 2017), Seville, Spain, 2017.
3. **Sharabi M.**, Benayahu D., Benayahu Y., and Haj-Ali R. Long collagen fibers reinforced bio-composite laminates and constructs, 2nd International Conference on Mechanics of Composites, University of Porto, Porto, Portugal, 2016
4. **Sharabi M.**, Benayahu D., and Haj-Ali R. Collagen fiber bio-composite laminates and constructs. 5th International Conference "Smart and Multifunctional Materials, Structures and Systems" (CIMTEC 2016), Perugia, Italy, 2016.
5. **Sharabi M.**, Benayahu D., Benayahu Y., and Haj-Ali R. Mechanical behavior of soft bio-composite laminated constructs. The 17th Israel materials engineering conference, (IMEC17), Ramat-Gan, Israel, 2016.
6. **Sharabi M.**, Varssano D., Benayahu D., Benayahu Y., and Haj-Ali R. Cornea bio-inspired constructs based on oriented long collagen fibers bio-composites. The 25th Congress of the International Society of Biomechanics (ISB2015) Glasgow, Scotland, 2015.
7. **Sharabi M.**, Benayahu D., Benayahu Y., and Haj-Ali R. A new class of bio-composite materials with soft-coral long collagen fibers. The Israel Society for Medical and Biological Engineering conference (ISMBE2015) Haifa, Israel, 2015.
8. **Sharabi M.** and Haj-Ali R. Biocomposite materials of unique collagen fibers, ICME 2012, Tel-Aviv University, Israel, 2012.
9. **Sharabi M.**, Benayahu D. and Haj-Ali R. Biocomposite materials of unique collagen fibers, 2nd TAU Biophysics students conference, Nazareth, Israel, 2012.

#### CONFERENCE POSTERS

1. **Sharabi M.** and Wagner DH, Bio-mimetics of Structural Micro-mechanisms in Soft Composite Materials, Architected Material Mechanics (AMM), IUTAM, Chicago, IL, USA, 2018.
2. **Sharabi M.**, Wertheimer S., Shelah O., Haj-Ali R. and Lesman A., Bio-composites Based on Coral Collagen Fibers for Tissue Engineering, Israel Society for Medical and Biological Engineering (ISMBE 2018), Haifa, Israel, 2018.
3. Sopher R. S., Tokash H., **Sharabi M.**, Tchaicheeyan O., and Lesman A., Nonlinear Elasticity of Biological Fibrous Networks Facilitates Efficient Inter-Cellular Mechanical Signaling, Israel Society for Medical and Biological Engineering (ISMBE 2018), Haifa, Israel, 2018.
4. Mann A., Koren Y., Sopher R., **Sharabi M.** and Lesman A. Computational modeling of cell-matrix and cell-cell interactions. Frontiers in single molecule biophysics meeting 2017, Neve Ilan hotel, Israel, 2017.
5. **Sharabi M.**, Benayahu D., and Haj-Ali R. Novel biocomposite materials and constructs based on unique collagen fibers for soft tissue bio-mimetics. MOST Conference, Tel-Aviv, Israel, 2016

6. **Sharabi M.**, Awad L., Benayahu Y., Haj-Ali R. and Benayahu D., A bio-composite based on long collagen fibers scaffold for mimicking intervertebral disc structure, Israel Society of Skeletal Biology and Medicine (ISSBM), Tel-Aviv, Israel, 2016.
7. **Sharabi M.**, Haj-Ali R., Non-Destructive Piezo-resistive Testing Devices for Self-Health Damage Monitoring of Composite Structures, Industrial Affiliates Program (IAP 2016), Tel-Aviv, Israel, 2016.
8. **Sharabi M.**, Benayahu D., Benayahu Y., and Haj-Ali R. A new class of bio-composite materials with soft-coral long collagen fibers. The Israel Society for Medical and Biological Engineering conference (ISMBE2015) Haifa, Israel, 2015.
9. **Sharabi M.**, Benayahu D., Benayahu Y., and Haj-Ali R. A new class of bio-composite materials with soft-coral long collagen fibers. Nanocomposites & Biocomposites (COMPO2014) Rehovot, Israel, 2015.