

CURRICULUM VITAE

Dafna Knani, DSc.

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Position: Senior Lecturer, Department of Biotechnology Engineering, ORT Braude Academic College,
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EDUCATION

MBA, 2001, Master in Business Administration, University of Haifa, Haifa, Israel.

D.Sc., 1990, Chemistry, Faculty of Chemistry, Technion-Israel Institute of Technology, Haifa, Israel.
Thesis: Enzymatic Polymerization of Hydroxyesters in Organic Media. **Supervisor:** Prof. D.H. Kohn

M.Sc., 1985, Chemistry, Faculty of Chemistry, Technion-Israel Institute of Technology, Haifa, Israel.
Thesis: Copolymerization of Vinyl Monomers Substituted by Nitrile and Sulfonyl Groups with Styrene and Acrylonitrile. **Supervisor:** Prof. D.H. Kohn

B.A., 1982, Chemistry, Faculty of Chemistry, Technion-Israel Institute of Technology, Haifa, Israel

ACADEMIC EXPERIENCE

2014- Head of MSc program in biotechnology

1996 - present: Member of academic staff, Department of Biotechnology Engineering, ORT Braude College, Karmiel.

1991 -1992: Adjunct Lecturer, Department of Chemical and Environmental Practical Engineering, Western Galilee College, Akko.

1982 -1990: Teaching Assistant, Faculty of Chemistry, Technion-Israel Institute of Technology, Haifa, Israel.

PROFESSIONAL EXPERIENCE

2014 : Visiting scientist at the Institut für Kunststoffverarbeitung (IKV), RWTH university Aachen, Germany

Research topics:

- Molecular modeling study of absorbable foam produced in a Controlled Expansion of Saturated Polymers process (CESP) with CO₂ used for efficient drug release in the urinary bladder
- Simulation of bilayer system based on neutral and cationic lipids in combination with fluorescent lipids (in collaboration with Dr. Agnes Csisza' r and Prof. Rudolf Merkel from Forschungszentrum Jülich GmbH, Jülich, Germany)

1996 – present : ORT Braude College

Research topic: Molecular Modeling of Materials and Biomaterials.

- Simulation of novel Soy_Gelatin and Soy_Alginat systems used for tissue regeneration applications (in collaboratin with Hila Olami and Prof. Meital Zilberman from the Dept. of Biomedical Engineering, Tel Aviv University, Israel)

- Molecular modeling of enzyme – catalyzed polyesterification in organic media
- Molecular modeling of gelatin and chondroitin sulphate interactions in aqueous medium (in collaboration with Prof. Rosa Azhari, Dept. of Biotechnology engineering, Braude College).

In collaboration with Dr. David Alperstein (Department of Mechanical Engineering, Braude College) :

- Determination of plasticizers efficiency for Nylon by molecular modeling
- Simulation of curing of styrene-free unsaturated polyester alkyd
- Study of Fire Retardant Blooming in HIPS By Molecular Modeling
- In silico study of gelators for polymers

Additional research topics:

- Investigation of the mechanism of catalytic oxidation of glucose, methanol and ethanol in fuel cells in collaboration with the fuel cells research group in Braude College.

1993 - 1995: Research Chemist and Project Leader at Israel Chemicals Ltd. (ICL) ,IMI (TAMI)-Institute for Research & Development, Department of Organic Chemistry, Haifa-Bay, ISRAEL. Development of a continuous process for enzymatic resolution of agrochemicals' intermediates.

1992- 1993: Research Polymer Chemist at Surgical Bio-Polymeric Materials, Ltd. (SBPM), Gutwirth Science Based Industries Center, Technion City, Haifa. Development of New Formulations for hard tissues Adhesives and *In-vitro* and *In-vivo* Adhesion Tests.

TEACHING EXPERIENCE

A. ORT Braude College

Graduate Courses:

- Drug Design and Development (New Course – MSc program)

Undergraduate Courses:

Biotechnology Engineering Department

- Medicinal Chemistry (New Course)
- Polymer Chemistry (New Course)
- General and Analytical Chemistry
- General and Physical Chemistry
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Mechanical Engineering Department

- Chemistry of engineering materials (New Course)
- General Chemistry

Laboratory Courses

- General and Physical Chemistry laboratory
- Medicinal chemistry laboratory (New Course)

Undergraduate Student Supervision (50 students)

1997- present: Supervision of undergraduate students during their internship period in the following industries and academic institutions (partial list):

Companies: Teva Pharmaceutical Industry, Agis Pharmaceutical Industry, Omrix Biopharmaceutical, Haifa Chemicals, Taro Pharmaceutical Industry, Neve Yaar - Institute for agricultural Research, D-Pharm, Biorest, Novotide, Biosight, Stepac, Polyheal, Enzymotec , Hanita Lenses , Ortoscan , Renopharm, Starplast, Trima, Protalix

Academic institutions: Technion - Israel Institute of Technology (Chemical Engineering Faculty, Plastics and Rubber Center, Biomedical Engineering Department), Harvard - MIT Division of Health Sciences and Technology

Practical Engineering Student Projects

1998 –1999 Badiner Larisa and Zaitun Nasamat: Optical resolution of chiral compounds using enzymes in organic media.

B. Other Universities

I. Western Galilee College

Undergraduate Courses:

- General and Analytical Chemistry
- Organic Chemistry

II. Technion – Israel Institute of Technology

Undergraduate Courses:

- General Chemistry
- Organic Chemistry
- Polymer Chemistry

PROFESSIONAL ACTIVITIES

- Development of the Medical Science program (2010 – present)
- Development of the MSc degree program (with thesis) (2010 – present)
- Member ,Development team of the Biotechnology MSc degree program (without thesis) (2003 – 2009)
- Member, Development team of the Biotechnology Engineering BSc degree program (2002 – 2005)
- Development of new academic expertise in Biomaterials and Pharma (2002 - 2004)
- Coordinator, Biomaterials track (2004 - present)
- Member, College animal experiments committee (2004 - present)
- Member, College library committee (2006 - present)
- Member, Educational committee of ORT Braude College (2000 – 2003)
- Member, Braude Academic Council (2001- 2005)
- Academic advisor to 3rd year and 4th year students (2005 - 2014)
- Member, Academic committee of ORT Braude College (2010 – 2013)
- Development of Medical Science degree program
- Development of Biotechnology research MSc degree program
- Development a joint Biotechnology Engineering- Mechanical Engineering BSc degree program

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- Israel Chemical Society
- American Chemical Society
- The Medicinal Chemistry Section of The Israel Chemical Society
- Israel Polymer and Plastics Society
- The Controlled Release Society

LIST OF PUBLICATIONS

A. Theses

D.Sc. Enzymatic Polymerization of Hydroxyesters in Organic Media.
Chemistry, Technion-Israel Institute of Technology , Haifa, Israel.

M.Sc. Copolymerization of Vinyl Monomers Substituted by Nitrile and Sulfonyl Groups with Styrene and Acrylonitrile.

Chemistry, Technion-Israel Institute of Technology , Haifa, Israel.

B. Refereed Papers

1. **D. Knani** and D.H. Kohn . Copolymerization of Styrene with Vinyl Monomers Substituted by Nitrile and Sulfonyl Groups, *Journal of Applied Polymer Science*, **43**, 1941 (1991).
2. **D. Knani**, A.L. Gutman and D.H. Kohn. Enzymatic Polyesterification in Organic Media. Enzyme Catalyzed Synthesis of Linear Polyesters. I. Condensation Polymerization of Linear Hydroxyesters. II. Ring-opening Polymerization of ϵ -caprolactone, *Journal of Polymer Science: Part A: Polymer Chemistry*, **31**, 1221 (1993).
3. **D. Knani** and D.H. Kohn. Enzymatic Polyesterification in Organic Media. Enzyme Catalyzed Synthesis of Lateral Substituted Polyesters and Copolyesters, *Journal of Polymer Science: Part A: Polymer Chemistry*, **31**, 2887 (1993).
4. I. Mironi-Harpaz, D. Alperstein, **D. Knani** and M. Narkis. Curing of Styrene-Free Unsaturated Polyester Alkyd: Synthesis, Characterization and Simulation, *Polymer International* , 59(6), 836-841 (2010). DOI: 10.1002/pi.2796
5. D. Alperstein, N. Kornberg and **D. Knani**. A Study of Fire Retardant Blooming In HIPS By Molecular Modeling, *Polymers for Advanced Technologies*, **22** , 1446-1451 (2011). DOI: 10.1002/pat.1636
6. E. Bashkansky, T. Gadrich and **D. Knani**. Some metrological aspects of the comparison between two ordinal measuring systems, *Accreditation and Quality Assurance*, 16 (2), 63–72 (2011). DOI: 10.1007/s00769-010-0741-2
7. D. Alperstein, **D. Knani**, A Goichman, and M. Narkis, "Determination of plasticizers efficiency for Nylon by Molecular Modeling", *Polymer Bulletin*, 68 (7), 1977-1988 (2012). DOI : 10.1007/s00289-012-0705-2
8. D. Alperstein, **D. Knani**, " In Silico studies of 1,3(R):2,4(S)-dibenzylidene-D-sorbitol as a gelator for Polypropylene", *Polymers for Advanced Technologies*, **24** (4), 391–397, (2013). DOI: 10.1002/pat.3093
9. D. Alperstein, **D. Knani**, "Toward computational design of efficient plasticizers for Nylon", *Polymers for Advanced Technologies* , **25** (3), 307-313 (2014). DOI: 10.1002/pat.3240
10. D. Alperstein, **D. Knani** , N. Borchmann, M. Spekowius, C. Hopmann, "Prediction of environmental stress cracking in polycarbonate by molecular modeling", *Polymers for Advanced Technologies* , Accepted: 25 July 2014, DOI: 10.1002/pat.3384

C. Unpublished Professional Reports

SBPM (1992-1993): Four internal research and development Reports

IMI (1993-1995): Four internal research and development Reports

(2003-2007): Consulting research and development Reports in collaboration with Dr. David Alperstein

1. Investigation and prediction of fire retardants activity and toxicity

2. Investigation of gelators for polymers
3. Investigation of corrosion inhibitors for polymers
4. Feasibility study and evaluation of technological validity of research proposals submitted to the chief scientist of ministry of industry and commerce by the nanotechnology consortium

D. Congress Papers, Proceedings and Posters

1. A.L. Gutman, T. Bravdo, K. Zuobi, and D. Knani "Enzymatic Synthesis of Chiral Lactones and Polyesters", The 56th Annual Meeting of the Israel Chemical Society, the Hebrew University of Jerusalem, Jerusalem, Israel, February 1991.
2. A.L. Gutman, T. Bravdo, M. Shapira, E. Meyer, K. Zuobi, D. Knani and D.H. Kohn "Stereospecific Synthesis with Enzymes in Organic Solvents", The 57th Annual Meeting of the Israel Chemical Society, Technion-Israel Institute of Technology, Haifa, Israel, February 1992.
3. A.L. Gutman, T. Bravdo, M. Shapira, E. Meyer, K. Zuobi, D. Knani and D.H. Kohn "Stereospecific Synthesis with Enzymes in Organic Solvents", a lecture given at The 58th Annual Meeting of the Israel Chemical Society, Bar-Ilan University, Ramat Gan, Israel, February 1993.
4. D. Knani, A.L. Gutman and D.H. Kohn "Enzymatic Polyesterification and Copolyesterification of Linear and Branched Hydroxyesters in Organic Media", a poster presented at the 58th Annual Meeting of the Israel Chemical Society, Bar-Ilan University, Ramat Gan, Israel, February 1993.
5. D. Knani and D. Alperstein, "In Silico studies of 1,3:2,4-dibenzylidene-D-sorbitol as a gelator for Polypropylene", a poster presented at The 6th European Conference on Computational Chemistry, Tale, Slovakia, September 2006.
6. D. Knani and D. Alperstein, "In Silico studies of 1,3:2,4-dibenzylidene-D-sorbitol as a gelator for Polypropylene", a lecture given at the 35th Annual Meeting of the Israel Polymer and Plastics Society, Herzlyia, Israel, December 2006.
7. D. Knani, M. Shilo and R. Azhari, "Molecular modelling of gelatin and chondroitin sulfate interactions in aqueous medium", The 6th Annual Israel Meeting of ICRS, Caesarea, September 2007.
8. D. Knani and D. Alperstein, "In Silico studies of 1,3:2,4-dibenzylidene-D-sorbitol as a gelator for Polypropylene", a lecture given at The 1st workshop on multiscale modelling of nanostructured and functional polymeric materials, Brno, Czech Republic, October 2007.
9. D. Knani, "Molecular modelling of gelatin and chondroitin sulfate interactions in aqueous medium", a lecture given at The 4th Interdisciplinary Research Conference, ORT Braude College, Nazareth Iit, Israel, October 2008.
10. D. Knani and D. Alperstein, "In Silico studies of 1,3:2,4-dibenzylidene-D-sorbitol as a gelator for Polypropylene", a poster presented at NanoIsrael 2009 Conference, Jerusalem, March 2009.
11. D. Knani and D. Alperstein, "Molecular modeling study of carbon nanotubes (CNT) dispersion in aqueous media", a lecture given at The 5th Interdisciplinary Research Conference, ORT Braude College, Naharyia, Israel, October 2009.
12. D. Knani and D. Alperstein, "Molecular modelling studies of curing of styrene-free unsaturated polyester alkyl", a lecture given at the 7th annual research meeting of Braude College, Kfar Bloom, October 2011.
13. D. Knani, "Molecular modeling of enzyme-catalyzed polyesterification", a lecture given at the 8th annual research meeting of Braude College, Acco, October 2012.
14. D. Knani and D. Alperstein, "In Silico studies of 1,3:2,4-dibenzylidene-D-sorbitol as a gelator for Polypropylene", a poster presented at Multifunctional, Hybrid and Nanomaterials Conference (Hybrid Materials 2013), Sorrento, Italy, March 2013.
15. D. Knani, "Molecular modeling of enzyme-catalyzed polyesterification", The 2nd Conference of The Israel Society for Biotechnology Engineering (ISBE), Tel-Aviv, December 2013.

16. D. Knani, ""Simulation of Bilayer Systems Based on Neutral and Cationic Lipids in Combination with Fluorescent Lipids" ,a lecture and a poster presented at the 9th Annual Meeting of the Israeli Chapter of The Controlled Release Society, September 9-11, 2014, Hacienda Forestview Hotel, Maalot, Israel. Chairperson of a session in the conference.