

## Tiffany Abitbol

Postdoctoral Fellow  
Curriculum vitae

The Hebrew University of Jerusalem

The Robert H. Smith Institute of Plant Sciences and Genetics in Agriculture, Food and the Environment  
P.O.B. 12 Rehovot, 76100, Israel

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### RESEARCH INTERESTS

Polymers – adhesives, coatings, transparent, responsive, bio-based

Nano-enhanced composite materials – coatings, stand-alone films, gels, and foams

Surface modification of nanoparticles for suspension stabilization and added functionality  
Self-assembly processes

Optically active materials – transparent, structural colors, fluorescence

Adsorption measurements/interaction studies using model surfaces

Effective Science communication (writing/editing)

### SKILLS

General polymer handling and processing (films/foams/fibers)

Cellulose nanocrystal preparation – control over viscosity, surface charge, and surface functionality

Surface charge measurements – Zeta-potential/mobility, conductometric titration

Coatings by spin-coating & doctor blade film coater

Mechanical/flow properties – Rheology, Dynamic Mechanical Analysis (DMA), Instron

Optical microscopy – Light, polarized, fluorescence

Surface profilometry

Infrared spectroscopy (ATR/FTIR)

Thermogravimetric analysis (TGA); Differential scanning calorimetry (DSC)

Scanning electron microscopy (SEM)

Atomic force microscopy (AFM)

Surface Plasmon Resonance (SPR)

Quartz crystal microbalance with dissipation (QCM-

D) Design of Experiments

Writing, Editing, Grant writing

### EDUCATION & EMPLOYMENT

Postdoctoral Fellow

The Hebrew University of Jerusalem, Department of Plant Science

Supervisor: Prof. Oded Shoseyov

10/2014-current

Rehovot, Israel

Research Assistant/Consultant

Melodea Ltd. (Cellulose nanocrystal start-up)

8/2014-current

Rehovot, Israel

Role: Consulting, generating a database, cellulose nanocrystal scale-up, cellulose nanocrystal-based foams

Postdoctoral Fellow McMaster University, Department of Chemical Engineering Supervisor: Prof. Emily Cranston	4/2012-8/2014 Hamilton, Ontario
PhD, Chemistry (Materials) McGill University Supervisor: Prof. Derek Gray Thesis: Preparation and characterization of cellulose-based nanomaterials	01/2004-08/2011 Montréal, Quebec
Science Editor, Wow Lab McGill University Supervisor: Morag Weller Role: Edited scientific content and style of documents generated by the Wow lab, a joint initiative of the faculties of Education and Science, tasked to create engaging "WOW" factor lesson plans for grades K-12.	03/2011-12/2011 Montréal, Quebec
Teaching Assistant McGill University Various Laboratories – Organic Chemistry (2006, 2007), General Chemistry (2004, 2005), Analytical Chemistry (2003)	2002-2007 Montréal, Quebec
BSc, Honors, Chemistry (Environmental Option) McGill University Supervisor: Prof. Derek Gray Thesis: Drying induced chiral twist in paper sheets	09/1999-12/2004 Montréal, Quebec

#### ART & SCIENCE

Part of design team for Israel's contribution to the Venice Biennale (International Architecture Exhibition). Specific role is to create nanocellulose foams and films as building blocks for architectural structures. 11/2015-current

Joint Hebrew University and Bezalel Academy of Arts and Design competition with the end goal of developing innovative products that straddle Science and Art. Project led to the design and prototyping of a sports garment with an unobtrusive, removable pouch feature that can be used to filter and purify water. 2<sup>nd</sup> place prize awarded in 4/2016. Prototype presented at 2016 Geek Picnic (Jerusalem, Israel) – a 3 day festival dedicated to science, technology and art. 5/2015-4/2016

#### SERVICE & COLLABORATIONS

Peer reviewer for Biomacromolecules, Composites Science and Technology, Analyst, Cellulose, Langmuir, ACS Sustainable Chemistry & Engineering, RSC Advances, Catalysis 2011-current

Industrial projects: Cabot Corporation/ Dr. Brian Prevo (Sr. Applications Development Specialist) and Christopher Galli (Lead Scientist)/ Project: Nanoparticles in solvent and waterborne coatings; Charlotte Products/ Asquith

Williams (General Manager)/ Project: Cellulose nanocrystals in a line of green cleaning products; Rescraft Plastic Products/ Doug Cunningham (President)/Project: Rotational molding of recycled plastics from agricultural waste.

Academic collaborations: Hayuka lab/ Hebrew University (6/2015-current); Shoseyov lab/ Hebrew University (12/2013-8/2014); Moran-Mirabal lab/ McMaster University (4/2012-8/2014); Quinn lab/ McGill University (2010, 2011); Eichhorn lab/ Manchester University (2008, 2009)

#### AWARDS

2 <sup>nd</sup> place in joint Hebrew University and Bezalel Academy of Arts and Design competition (5000 NIS)	2016
Best poster at Hebrew University Center for Nanoscience annual meeting (1000 NIS)	2015
Azrieli Postdoctoral Fellowship (40,000 CAD/year)	2014-current
Best poster at Cost Action Workshop	2014
Eastman Chemical Graduate student award, 3 <sup>rd</sup> place (1500 USD)	2009
Graduate Research Enhancement and Travel Award (750 CAD)	2009
McGill University Alma Mater Travel Grant (750 CAD)	2006

#### LANGUAGES

English (native)

French (intermediate in written and spoken)

Hebrew (intermediate in written and spoken)

#### VOLUNTEERING

Neot Semadar Kibbutz, Arava Desert, Israel	6/2016-8/2016
Lasova Soup Kitchen, Tel Aviv, Israel	11/2014-current
English language tutor at ARDC (African Refugee Development Centre), Tel Aviv, Israel	11/2014-6/2015

#### PUBLICATIONS & PATENTS

15. Abitbol T, Marway H, Kedzior S, Yang X, Franey A, Gray, DG, Cranston ED (2016) "Hybrid fluorescent nanoparticles from quantum dots coupled to cellulose nanocrystals" Manuscript in Preparation.
14. Abitbol T, Rivkin A, Cao Y, Nevo Y, Abraham E, Ben-Shalom T, Lapidot S, Shoseyov O (2016) "Nanocellulose, a tiny fiber with huge applications" *Current Opinion in Biotechnology*, 39, 76-88.
13. Rivkin A\*, Abitbol T\*, Nevo Y, Verker R, Lapidot S, Komarov A, Veldhuis SC, Zilberman G, Rechtes M, Cranston ED, Shoseyov O. (2015) "Bionanocomposite films from Resilin-CBD bound to cellulose nanocrystals", *Industrial Biotechnology*, 11(1), 44-58. \*First two authors contributed equally. Invited contribution: Nanocellulose themed issue.
12. Abitbol T, Prevo BG, Galli C, Choudhary S, Corwin J, Villapando-Páez F, Nguyen L, Komarov A, Villalobos M, Veldhuis SC, Cranston ED. (2014) "Comparison of nanocrystalline cellulose and fumed silica in latex coatings", *Green Materials*, 2(4), 206-221. Invited contribution: Green Nanocomposites themed issue.
11. Abitbol T, Marway H, Cranston ED. (2014) "Surface modification of cellulose nanocrystals with cetyltrimethylammonium bromide", *Nordic Pulp and Paper Research Journal*, 29 (1), 46-57. Invited contribution, themed issue: Nanocellulose.

10. Abitbol T, Palermo A, Moran-Mirabal JM, Cranston ED. (2013) "Fluorescent labeling and characterization of cellulose nanocrystals with varying charge contents", *Biomacromolecules*, 14(9), 3278-3284.
9. Book Chapter: Abitbol T, Cranston ED. (2013) "Directed assembly of oriented cellulose nanocrystal films", in *Handbook of Green Materials, Vol. 3 Self-and Directed Assembling of Bio Nanomaterials*; Oksman K, Rojas O, Qvintas P, Eds. Invited contribution.
8. Book Chapter: Abitbol T, Cranston ED. (2013), "Chiral nematic self-assembly of cellulose nanocrystals in suspensions and solid films", in *Handbook of Green Materials, Vol. 3 Self-and Directed Assembling of Bio Nanomaterials*; Oksman K, Rojas O, Qvintas P, Eds. Invited contribution.
7. Abitbol T, Kloser E, and Gray DG. (2013) "Estimation of the surface sulfur content of cellulose nanocrystals prepared by sulfuric acid hydrolysis", *Cellulose*, 20(2), 785-794.
6. Abitbol T, Johnstone T, Quinn TM, and Gray, DG. (2012) "Reinforcement with cellulose nanocrystals of polyvinyl alcohol hydrogels prepared by cyclic freezing and thawing", *Soft Matter*, 7(6), 2373-2379.
5. Abitbol T, Wilson JT, and Gray DG. (2011) "Electrospinning of fluorescent fibers from CdSe/ZnS quantum dots in cellulose triacetate", *Journal of Applied Polymer Science*, 119(2), 803-810.
4. Patent: Gray DG and Abitbol T. (2010) "Cellulose composites comprising hydrophobic particles and their use in paper products", US Patent 7820009.
3. Abitbol T and Gray DG. (2009) "Incorporation into paper of cellulose triacetate films containing semiconductor nanoparticles", *Cellulose*, 16(2), 319-326. (Cover art)
2. Abitbol T and Gray DG. (2007) "CdSe/ZnS quantum dots embedded in cellulose triacetate films with hydrophilic surfaces", *Chemistry of Materials*, 19(17), 4270-4276.
1. Yu M, Abitbol T, and Gray DG. (2004) "Evidence for a chiral internal stress in paper sheets", *Journal of Pulp and Paper Science*, 30(4), 91-94.

#### SELECTED PRESENTATIONS

Abitbol T, Rivkin A, Shoseyov O (2015) "Bionanocomposite films from resilin-cellulose binding domain bound to cellulose nanocrystals", The Hebrew University of Jerusalem Center for Nanoscience and Nanotechnology, Ashkelon, Israel. (Poster)

Abitbol T, Marway H, Cranston ED. (2014) "Surface modification of cellulose nanocrystals with cetyltrimethyl ammonium bromide", Third Cost Action FP1205 Workshop within the areas of "Science and uses of nanocellulose" and "Cellulose films and foams", Bangor, UK. (Poster)

Abitbol T, Palermo A, Moran-Mirabal JM, and Cranston ED. (2013) "Fluorescent labeling and characterization of cellulose nanocrystals with a range of charge contents", ACS National Meeting, New Orleans, Louisiana, USA. (Poster)

Abitbol T, Kloser E, and Gray DG. (2011) "Estimation of surface sulfate content of cellulose nanocrystals prepared by sulfuric acid hydrolysis". ACS Colloids Symposium, Montreal, Quebec, Canada. (Talk)

Abitbol T, Quinn TM, and Gray DG. (2010) "Reinforcement of polyvinyl alcohol hydrogels with cellulose nanocrystals", Pacificchem, Honolulu, Hawaii, USA. (Talk)

Abitbol T, Quinn TM, and Gray DG. (2010) "Polyvinyl alcohol hydrogels reinforced with cellulose nanocrystals", ACS National Meeting, San Francisco, California, USA. (Talk)

Abitbol T and Gray DG. (2009) "Electrospun fluorescent fibres from quantum dots in cellulose triacetate", ACS National Meeting, Salt Lake City, Utah, USA. (Talk)

Abitbol T and Gray DG. (2008) "Evidence for drying-induced chiral internal stress in paper", ACS National Meeting, New Orleans, Louisiana, USA. (Poster)

Abitbol T and Gray DG. (2007) "Incorporation of quantum dot taggants into paper and board products". ACS National Meeting, Chicago, Illinois, USA. (Talk)