

Curriculum Vitae – Orly Levitan

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EDUCATION

- 2001-2005:** Direct track to M.Sc. in Environmental and plant biology and B.Sc. in biology at the Faculty of Life Sciences, Bar-Ilan University, Ramat Gan, Israel.
Title of M.Sc. thesis: The influence of elevated atmospheric $p\text{CO}_2$ on N_2 fixation and photosynthesis in the marine cyanobacterium *Trichodesmium erythraeum*.
Advisor: Dr. Ilana Berman-Frank.
- 2005- 2010:** Ph.D. research in Aquatic Ecology at The Mina and Everard Goodman Faculty of Life Sciences at Bar-Ilan University, Ramat Gan, Israel.
Title of PhD thesis: The influence of $p\text{CO}_2$, temperature and light on the marine diazotrophic cyanobacteria, *Trichodesmium* spp.
Advisor: Dr. Ilana Berman-Frank

ACADEMIC EMPLOYMENT AND TEACHING EXPERIENCE

- 2004-2010** Teaching assistant at the Mina and Everard Faculty of Life Sciences at Bar-Ilan University, in three courses: Biochemistry -200 level, Introduction to Ecology, and The Global Importance of Algae.
- 2002-2003** Teaching life science courses to gifted youth at Bar Ilan University youth program.
- 2010-present** Conducting research as a Post-doctoral Associate in Prof. Paul Falkowski's biofuels group at the Institute of Marine and Coastal Sciences, Rutgers University. The research is focused on understanding and manipulating the biochemical pathways of the central carbon metabolism pathways in diatoms.

RESEARCH INTERESTS

- Nitrogen fixation
- Photosynthesis, carbon decision tree, and carbon concentration mechanisms in cyanobacteria and algae
- Anthropogenic effect on the open, oligotrophic ocean fauna and its effect on biogeochemical cycles
- Microorganisms as the key factor in evolutionary processes
- Redox reactions in biological systems
- Renewable energy and biofuels

AWARDS AND DISTINCTIONS

- 2004** B.Sc. graduating with high distinction- *summa com laude*
2006 Graduating the fast track to M.Sc. with distinction- *magna com laude*
2006 The University's Rector's award for excellence of Ph.D. students
2007 Wolf Foundation award for Ph.D. students
2008 Best student scientific paper award from the Israeli Association of Aquatic Sciences
2009 The University's Rector's award for excellence of Ph.D. students (second time)

FELLOWSHIPS AND SCHOLARSHIPS

- 2005** The Rieger Foundation-Jewish national fund program fellowship for Environmental studies, for M.Sc. students
- 2006-2007** Israeli Ministry of Sciences one-year scholarship for women in science
- 2005 – 2008** The University's President scholarship for doctoral studies
- 2005, 2006, 2007, 2008, 2009, 2010** The Dean's Excellence Scholarship: The Mina and Everard Goodman Faculty of life sciences at Bar-Ilan University
- 2008** DAAD (The German Academic Exchange Service) scholarship for 2 months research at the Alfred Wegener Institute (AWI), Bremerhaven, Germany.
- 2008** Rieger Foundation-Jewish national fund program fellowship for Environmental studies, for Ph.D. students
- 2008-2010** Eshkol scholarship for excellent Ph.D. students, given by the Israeli Ministry of Sciences

FIELD WORK EXPERIENCE

- 2006** Participated in the RV/ Meteor Atlantic Ocean Cruise (leg 68/3). Examining the combined effect of elevated $p\text{CO}_2$ and nutrients on population of Atlantic diazotrophs and photoautotroph.
- 2008** Examining the combined effect of elevated $p\text{CO}_2$ and nutrients on natural population of the Gulf of Aqaba (Eilat). Organized one month of fieldwork, including building and setting up instruments to prepare the experiment for participants from Germany and the Czech Republic.
- 2009** Examining the combined effect of elevated $p\text{CO}_2$ and nutrients on natural population of Atlantic diazotrophs and photoautotroph, off shore of the Cape Verde Islands. National Institute for Fisheries of the Republic of Cape Verde (INDP), Sao Vicente, Cape Verde.

OTHER PROFESSIONAL ACTIVITIES

- 2004- 2005** Studied physiological and bio-optical response of the nitrogen fixing cyanobacteria, *Trichodesmium* IMS101, to different levels of $p\text{CO}_2$, in the lab of Dr. Ondrej Prasil, Laboratory of Photosynthesis, Institute of Microbiology Trebon, Czech Republic.
- 2005 - 2006** Konstanz University, Germany. Collaborative research on *Trichodesmium*'s response to iron availability in the lab of Prof. Dr. Hendrik Küpper.
- 2007** Conducted research at the IFM-GEOMAR in Kiel, Germany as part of the joint BMBF-MOST project with Ilana Berman-frank and Julie LaRoche .
- 2008** Assisted in organizing a workshop of the Group for Aquatic Primary Productivity (GAP) that was held at the Interuniversity Institute (IUI) in Eilat, Israel in May 2008.
- 2007- 2008** Working on light and $p\text{CO}_2$ effects on *Trichodesmium* IMS101 at the Alfred Wegener Institute (AWI), Bremerhaven, Germany. The study was conducted in the group of Prof. Dieter Wolf-Gladrow, together with Dr. Sven Kranz and under the supervision of Dr. Bjoern Rost.
- 2007-2010** Instruction of undergraduates and graduate students in the lab of Dr. Berman-Frank.

MILITARY SERVICE

- Completed 6 years of army service as a Captain in the Israeli intelligent corps:
- 1999-2002** Designer and system analyst of communication systems.
Managing technological teams, designing projects and budgets.
- 1997-1999** Technological / operational officer in a field base.
- 1996** Technological communication researcher.

LANGUAGES

Hebrew – mother tongue

English – fluent

German – Basic

PEER REVIEWED PAPERS

2007

Levitan, O., Rosenberg, G., Šetlík I., Šetlíkova E., Gtigel, J., Klepetar, J., Prášil, O., Berman-Frank, I.. 2007. Elevated CO₂ enhances nitrogen fixation and growth in the marine cyanobacterium *Trichodesmium*. *Global Change Biology* **13**: 1-8

Berman-Frank, I., Rosenberg, G., **Levitan, O.**, Haramaty, L., Mari X.. 2007. Coupling between autocatalytic cell death and transparent exopolymeric particle production in the marine cyanobacterium *Trichodesmium*. *Environmental Microbiology* **9**: 1415-1422

2008

Küpper, H., Seibert, S., Šetlík, I., Prášil, O., Šetlíkova, E., Strittmatter, M., **Levitan, O.**, Lohscheider, J., Adamska, I., Berman-Frank, I.. 2008. Iron limitation in the marine cyanobacterium *Trichodesmium* reveals new insights into regulation of photosynthesis for nitrogen fixation. *New Phytologist*. **179**: 784-798

2009

Suggett, DJ, Stambler, N., Prášil O, Kolber, Z., Quigg, A., Vázquez-Dominguez E., Zohary, T., Berman T., Iluz D., **Levitan, O.**, Lawson, T., Meeder, E., Bar-Zeev, E., Medova, H., Berman-Frank, I.. 2009. Nutrient control of oceanic microbial growth during spring in the Gulf of Aqaba. *Aquatic Microbial Ecology* **56**: 227-239

Ionescu, D., Oren A., **Levitan, O.**, Hindiyeh, H., Malkawis, H., Berman-Frank, I.. 2009. The cyanobacterial community of the Zerka Ma'in hot springs, Jordan: morphological and molecular diversity and nitrogen fixation. *Algological Studies* **130**: 109-124

2010

Levitan, O., Brown, CM., Sudhaus, S., Campbell, D., LaRoche, J., and Berman-Frank, I.. 2010. Regulation of Nitrogen Metabolism in the Marine Diazotroph *Trichodesmium* IMS101 under Varying Temperatures and Atmospheric CO₂ Concentrations. *Environmental Microbiology*. **12(7)**: 1899-1912

Kranz, SA., **Levitan, O.**, Richter, K-U., Prášil, O., I. Berman-Frank I. Rost, B.. 2010. Combined effects of pCO₂ and light on the N₂ fixing cyanobacteria *Trichodesmium* IMS101: Physiological responses. *Plant Physiology* **154**: 334-345

Levitan, O., Kranz, SA., Spungin, D., Prášil, O., Rost, B., Berman-Frank, I.. 2010. The combined effects of pCO₂ and light on the N₂ fixing cyanobacterium *Trichodesmium* IMS101: A mechanistic view. *Plant Physiology* **154**: 346-356

Levitan, O., Sudhaus, S., LaRoche, J., Berman-Frank, I.. The influence of varying pCO₂ and temperature on gene expression of carbon and nitrogen pathways in *Trichodesmium* IMS101. *PLoS ONE*. **5(12)**: e15104

2011

Sharon, Y., **Levitan, O.**, Spungin, D., Berman-Frank, I., Beer, S.. 2011. Photoacclimation of the seagrass *Halophila stipulacea* to the dim irradiance at its 48-meter depth limit. *Limnology and Oceanography*. **(56)1**: 357-362

Manuscripts In review

Spungin, D., Berman-Frank, I., **Levitan, O.** *Trichodesmium* strategies to counteract P-imitation in the future acidified oceans. Resubmitted to *Environmental Microbiology*.

Guerra, T., **Levitan, O.**, Frada, M.J., Sunb, J.S., Falkowski P.G., Dismukes, C.G.,
Regulatory branch points affecting protein and lipid biosynthesis in the diatom
Phaeodactylum tricornutum. In review at journal of biomass and bioenergy.

Levitan, O., Dinamarca, J., Hochman, G., Falkowski, P.G.. Diatoms: the fossil fuels of the
future. In review at Trends in Biotechnology.

Manuscripts in preparation

Levitan, O., Dinamarca, J., Ehud ZelZion, Van Mooy, B., Bhattacharya, D., Falkowski, P.G..
Lipids and transcriptome analysis of central carbon metabolism pathways in
Phaeodactylum tricornutum. In prep for The Plant Cell.

Marie-Mathilde Perrineau, M.M., Zelzion, E., Gross, j., Price, D., Boyd, J., **Levitan, O.**, Bafna,
V., Udpa, N., Ronen, R., Bhattacharya, D.. Experimental evolution as a tool for the
improvement of algal biofuel crops. In prep for Nature Biotechnology.

Levitan, O., Sudhaus, S., Dpungin, D., Rahav, E., LaRoche, J., Berman-Frank, I.. The
combined influence of elevated pCO₂ on the photosynthetic and diazotrophic
population in the Gulf of Aqaba (Eilat). In prep for Limnology and Oceanography.

CONFERENCES AND SEMINARS

Oral presentations

- 2006** ASLO (American Society of Limnology and Oceanography) conference, Victoria,
British Columbia, Canada. The influence of elevated atmospheric pCO₂ on N₂ fixation
and photosynthesis in the marine cyanobacterium *Trichodesmium* IMS101.
- 2007** A colloquium talk given at the Alfred Wegener Institute (AWI), Bremerhaven,
Germany. The influence of global changes on the marine cyanobacterium
Trichodesmium IMS101.
- 2009** Advancing Marine Science conference. Eilat, Israel. The combined influence of ocean
acidification and nutrient enrichment on diazotrophic and phototrophic communities of the
Gulf of Aqaba.
- 2010** The Israel-French Mini Symposium. Haifa, Israel. The diazotrophic cyanobacterium
Trichodesmium in the future ocean.
- 2010** The Israeli Association for Aquatic Sciences. Eilat, Israel. Diazotrophs in the future
Ocean.
- 2012** SD-Cab fuel and food symposium. Crop protection in the diatom *Phaeodactylum*
tricornutum.
- 2013** Environmental Geology & Geochemistry Seminar (EGGS), Department of
Geosciences, Princeton University. Using molecular tools to make *Phaeodactylum*
tricornutum a platform for future renewable energy.

Poster presentations

- 2006** The Israeli Society of Microbiology, Beer-Sheva University, Israel and at the Israeli
society of aquatic sciences, Haifa University. The influence of elevated atmospheric
pCO₂ on N₂ fixation and photosynthesis in the marine cyanobacterium
Trichodesmium IMS101
- 2008** The Second international symposium on the ocean in a high CO₂ world, Monaco.
Regulation of nitrogen metabolism in the marine diazotroph *Trichodesmium* IMS101
under varying temperature and atmospheric CO₂ concentrations.

PEER REVIEWER

Proceedings of the National Academy of Sciences, Marine Ecology Progress series, FEMS,
Deep Sea Research- part 1, Limnology and Oceanography, Global Change Biology,
Geobiology, European Journal of phycology, Science, and Aquatic Microbial Ecology.