

**BIOGRAPHICAL SKETCH**

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NAME Nitsan Maharshak		POSITION TITLE Assistant Professor, Tel Aviv Medical Center, Tel Aviv University, Israel	
eRA COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
Tel Aviv University, Sackler School of Medicine, Tel Aviv, Israel	MD	1990-1997	Medicine
Tel Aviv Medical Center, Tel Aviv, Israel	Residency	10/02-09/06	Internal Medicine
Weizmann Institute of Science, Rehovot, Israel	Postdoctoral training	10/06-8/07	Immunology
Tel Aviv Medical Center, Tel Aviv, Israel	Residency	09/07-02/10	Gastroenterology and Liver diseases
University of North Carolina	Postdoctoral training	08/10-01/13	Immunology & Microbiology

**B. Positions and Honors****Positions and Employment**

1998-2002 Physician, Israeli Defense Forces.  
 2002-2006 Resident Physician in Internal Medicine, Tel Aviv Medical Center, Tel Aviv, Israel  
 2006-2007 Postdoctoral Researcher in Immunology, Weizmann Institute of Science, Rehovot, Israel  
 2006-current Lecturer, Department of Medicine, Sackler School of Medicine, Tel Aviv University, Tel Aviv, Israel  
 2007-2010 Resident Physician in Gastroenterology and Liver Diseases, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel  
 2010 Senior physician, Department of Gastroenterology and Liver diseases, Tel Aviv Medical Center, Tel Aviv, Israel  
 2010-2013 Postdoctoral Research Associate, University of North Carolina, Chapel Hill, NC, USA  
 2013- currently Senior physician, IBD Center, Department of Gastroenterology and Liver diseases, Tel Aviv Medical Center, Tel Aviv, Israel  
 2013-current Assistant Professor, Tel Aviv University  
 2014-current Head of the Bacteriotherapy Clinic  
 2016-current Deputy Chief, Department of Gastroenterology and Liver Diseases  
 2017-current Head of IBD Unit, Department of Gastroenterology and Liver Diseases, TLVMC

**Licensures and Certifications**

1998 Israel Medical License, Registration No. 30222  
 1998 Educational Commission for Foreign Medical Graduates (ECFMG) certification  
 2006 Board Certified Member of Israel Medical Association of Internal Medicine  
 2010 Board Certified Member of Israel Medical Association of Gastroenterology and Liver disease

**Other Experience and Professional Memberships**

2003-current Member of the Israeli Medical Association  
 2007-current Member of the Israel Association for Gastroenterology and Liver Diseases  
 2008-current Member of the American Gastroenterology Association  
 2011-2013 Member of the Crohn's & Colitis Foundation Association

2013-current Member of the European Crohn's and Colitis Organization

### Honors

2004- Young Investigator Award, Israel Society of Internal Medicine Conference, Israel  
 2008- Best Poster Award, 3<sup>rd</sup> Binational Israeli-Italian Gastroenterology Conference, Israel  
 2008- Excellence Enhancement Award, Tel Aviv Sourasky Medical Center, Israel  
 2010- The Sima Vaisman Award for research abroad, Sackler School of Medicine, Israel  
 2013- European Crohn's and Colitis Organization (ECCO). Top 10 abstracts award, Vienna, Austria

### C. Selected Peer-reviewed Publications (out of 57)

1. L. Zilberman, N. Maharshak, Y. Arbel, O. Rogowski, M. Rozenblat, I. Shapira, I. S. Berliner, N. Arber, I. Dotan. Correlated expression of high-sensitivity C-reactive protein in relation to disease activity in inflammatory bowel disease: lack of differences between Crohn's disease and Ulcerative Colitis. *Digestion*, Vol. 73 (4), pp. 205-209, 2006.
2. N. Maharshak, Y. Arbel, NM. Borenstein, A. Gal-Oz, AY. Gur, I. Shapira, O. Rogowski, S. Berliner, Z. Halpern, I. Dotan. Inflammatory bowel disease is not associated with increased intimal media thickening. *Am J Gastroenterol*. Vol. 102(5), pp. 1050-1055, 2007.
3. O. Raz, O. Rogowski, I. Shapira, N. Maharshak, Y. Karni, S. Berliner. Dissociated effects of physical activity and weight loss on fibrinogen concentrations and markers of red blood cell aggregation. Relevance for life style modification and in atherothrombosis. *Clin Hemorheol Microcirc*. Vol. 37(3), pp. 253-262, 2007.
4. Y. Gore, D. Starlets, N. Maharshak, S. Beker-Herman, U. Kaneyuki, L. L. Leng, R. Bucala, I. Shachar. Macrophage migration inhibitory factor (MIF) induces B cell survival by activation of a CD74/CD44 receptor complex. *J Biol Chem*. Vol. 283(5), pp. 2784-2792, 2008.
5. N. Maharshak, Y. Arbel, A. Gal-Oz, O. Rogowski, I. Shapira, S. Berliner, Y. Vered, J. Canaani, I. Dotan. Comparative analysis between Bayer wide range C-reactive protein (wr- CRP) and the Dade-Behring high sensitivity C-reactive protein (hs-CRP) in patients with inflammatory bowel disease. *J Dig Dis*. Vol. 9, pp. 140-143, 2008.
6. N. Maharshak, L. Zilberman, Y. Arbel, I. Shapira, S. Berliner, N. Arber, I. Dotan. Microinflammation in patients with Crohn's disease in clinical remission. *J Crohn's Colitis*. Vol. 2 (4), pp. 310-314, 2008.
7. N. Maharshak, Y. Arbel, I. Shapira, S. Berliner, R. Ben-Ami, S. Yedgar, G. Barshein, I. Dotan. Increased strength of erythrocyte aggregates in blood of patients with inflammatory bowel diseases. *Inflamm Bowel Dis*. Vol.15(5), pp. 703-713, 2009.
8. I. Dotan, L. Werner, S. Vigodman, S. Weiss, E. Brazowski, N. Maharshak, O. Chen, H. Tulchinsky, Z. Halpern, H. Guzner-Gur. CXCL12 is a constitutive and inflammatory chemokine in the intestinal immune system. *Inflamm Bowel Dis*. Vol.16(4), pp. 583-592, 2010.
9. N. Maharshak, G. Hart, E. Ron E, E. Zelman, A. Sagiv, N. Arber, E. Brazowski, R. Margalit, E. Elinav, I. Shachar. CCL2 (pM levels) as a therapeutic agent in inflammatory bowel disease models in mice. *Inflamm Bowel Dis*. Vol. 16(9), pp. 1496-1504, 2010.
10. N. Maharshak, S. Cohen, F. Lantner, G. Hart, L. Leng, R. Bucala I. Shacher. CD74 is a novel survival receptor on colon epithelial cells. *World J Gastroenterol*. Vol 16(26), pp. 3258-66, 2010.
11. Maharshak N, Hart G, Ron E, Zelman E, Sagiv A, Arber N, Brazowski E, Margalit R, Elinav E, Shachar I. CCL2 (pM levels) as a therapeutic agent in Inflammatory Bowel Disease models in mice. *Inflamm Bowel Dis*. 2010;16:1496-504.

12. Hod K, Dickman R, Sperber A, Melamed S, Dekel R, Ron Y, Halpern Z, Berliner S, Maharshak N. Assessment of high-sensitivity CRP as a marker of micro-inflammation in irritable bowel syndrome. *Neurogastroenterol Motil.* 2011;23:1105-10.
13. Cohen S, Shoshana OY, Zelman-Toister E, Maharshak N, Binsky-Ehrenreich I, Gordin M, Hazan-Halevy I, Herishanu Y, Shvidel L, Haran M, Leng L, Bucala R, Harroch S, Shachar I. The cytokine midkine and its receptor RPTPzeta regulate B cell survival in a pathway induced by CD74. *J Immunol.* 2012;188:259-69.
14. Elloumi HZ, Maharshak N, Rao KN, Kobayashi T, Ryu HS, Muhlbauer M, Li F, Jobin C, Plevy SE. A cell permeable peptide inhibitor of NFAT inhibits macrophage cytokine expression and ameliorates experimental colitis. *PLoS One.* 2012;7:e34172. Maharshak N and Elloumi HZ had contributed equally to the article
15. Lennon E, Maharshak N, Elloumi H, Borst L, Plevy SE, Moeser AJ. Early life stress triggers persistent colonic barrier dysfunction and exacerbates colitis in adult IL-10-/- mice. *Inflamm Bowel Dis.* 2013;19(4):712-9. Maharshak N and Lennon E contributed equally to the article.
16. Maharshak N, Shenhar-Tsarfaty S, Aroyo N, Orpaz N, Guberman I, Canaani J, Halpern Z, Dotan I, Berliner S, Soreq H. MicroRNA-132 Modulates Cholinergic Signaling and inflammation in Human Inflammatory Bowel Disease. *Inflamm Bowel Dis.* 2013;19(7):136-53.
17. Onyiah JC, Sheikh SZ, Maharshak N, Russo SM, Steinbach EC, Kobayashi T, Mackey LC, Moeser AJ, Rawls JF, Borst LB, Otterbein LE, Plevy SE. Carbon monoxide and heme oxygenase-1 maintain intestinal homeostasis in mice through augmented bacterial clearance. *Gastroenterology.* 2013;144(4):789-798.
18. Maharshak N, Packey CD, Manick S, Siddle JP, Ellermann M, Plevy SE, Sartor RB, Carroll IM. Altered enteric microbiota ecology in interleukin 10-deficient mice during development and progression of intestinal inflammation. *Gut Microbes.* 2013;4(4):316-24.
19. Nighot PK, Young KM, Sung EJ, Maharshak N, Plevy SE, Blikslager AT. Chloride channel ClC-2 is a key factor in the development of DSS-induced murine colitis. *Inflamm Bowel Dis.* 2013;19(13):2867-77.
20. Kobayashi T, Russo SM, Matsuoka K, Nochi T, Maharshak N, Borst LB, Hostager B, Garcia-Martinez JV, Rothman PB, Kashiwada M, Murray PJ, Plevy SE. NFIL3 deficient mice develop microbiota dependent, IL-12/23 driven spontaneous colitis. *Ji.* 2014;15;192(4):1918-27
21. Reshef A, Kovacs A, Yahav L, Keren N, Ofer A, Maharshak N, Konikoff FM, Tulchinsky H, Gophna U, Dotan I. Pouch inflammation is associated with a decrease in key bacterial taxa. *Gastroenterology.* 2015; 149(3):718-27
22. Maharshak N, Huh E, Thurlow L, Herzog J, Djukic Z, Orlando R, Pawlinski R, Zang Y, Shanahan M, Ellermann M, Borst L, Patel S, Von Furstenberg R, Dotan, I, Henning S, Sartor RB, Carroll IM. Enterococcus faecalis serine protease mediates intestinal permeability and inflammation via Protease Activated Receptor 2. *Infect Immun.* 2015;83(7):2762-70
23. Ringel Y, Maharshak N, Ringel Kulka T, Lundqvist A, Sartor RB, Carroll, IM. High throughput sequencing reveals distinct microbial populations within the mucosal and luminal niches in healthy Individuals. *Gut Microbes.* 2015;6(3):173-81  
Maharshak N and Ringel Y contributed equally to the article.
24. Maharshak N, Ryu HS, Jia FanT, Onyiah JC, Schulz S, Otterbein SL, Wong R, HansenJ, Otterbein EL, Carroll I, Plevy SE. Escherichia coli heme oxygenase modulates host innate immune responses. *Microbiol Immunol.* 2015;59(8):452-65
25. Hod K, Ringel-KulkanT, Martin CF, Maharshak N, Ringel Y. High Sensitive C-Reactive Protein as a Marker for Inflammation in Irritable Bowel Syndrome. *JCG.* 2016. 50(3):227-32.
26. Maharshak N, Cohen NA, Reshef L, Tulchinsky H, Gophna U, Dotan I. Enteric microbiota alterations in patients with a normal ileal pouch are predictive of pouchitis. *JCC* 2016.

27. Cohen NA, Livovsky DM, Yaakovovitch S, Ben Yehoyada M, Ben Ami R, Adler A, Guzner-Gur H, Goldin E, Santo ME, Halpern Z, Paz K, Maharshak N. Fecal microbiota transplantation for recurrent *Clostridium difficile* infection is highly effective- a retrospective study from two Israeli tertiary centers. *Isr Med Assoc J*. 2016.

### **C. Research Support**

#### **Ongoing Research Support**

- 2012- Abbott Laboratories. Adalimumab for post operative Crohn's disease patients. \$452000  
2013- Tel Aviv Medical Center. Research support for Excellency. \$23000  
2015- Sackler School of Medicine, Tel Aviv University. Proteases in pouch inflammation. \$10000  
2015- Israeli Gastrointestinal Association. Fecal Microbial Transplantation for Diabetes and Obesity. \$10000  
2017- European Crohn's and Colitis Organization (Pioneer grant). FMT & diet for ulcerative colitis. €200000

#### **Completed Research Support**

- 2008 The Stolz Foundation, Sackler School of Medicine, Tel Aviv University, Tel Aviv, Israel. Research scholarship: "CCL2 as a therapeutic agent for colon cancer models in mice". \$10,000  
2011 American Physicians Fellowship, Research fellowship grant. \$5000  
2012 Crohn's and Colitis Foundation of America. Mammalian and Bacterial Heme Oxygenase Modulate Intestinal Inflammation . \$56000.