

# Brian P. Timko

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## Education

- |           |                                     |  |
|-----------|-------------------------------------|--|
| 2002-2009 | Harvard University<br>Cambridge, MA | <ul style="list-style-type: none"><li>• <b>Ph.D. in Chemistry (2009)</b></li><li>• <b>A.M. in Chemistry (2004)</b></li></ul>   |
| 1998-2002 | Lehigh University<br>Bethlehem, PA  | <ul style="list-style-type: none"><li>• <b>B.S. in Chemistry with Highest Honors (2002)</b></li><li>• <b>B.S. in Chemical Engineering with Highest Honors (2002)</b></li><li>• Elected to <b>Phi Beta Kappa</b> and <b>Tau Beta Pi</b> honor societies</li></ul> |

## Work Experience

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|-----------|-------------------------------|--|
| 2016 -    | Assistant Professor           | Tufts University, Dept. of Biomedical Engineering, Medford MA    |
| 2016 -    | Research Affiliate            | Boston Children's Hospital, Harvard Medical School, Boston MA    |
| 2013-2016 | Instructor in Anaesthesiology | Boston Children's Hospital, Harvard Medical School, Boston MA    |
| 2009-2013 | Postdoctoral Fellow           | MIT Koch Institute for Integrative Cancer Research, Cambridge MA |

## Awards, Fellowships and Honors

- 2016 MIT Sloan Healthcare Innovations Prize
- 2016 Finalist, MIT 100k Accelerate Competition
- 2016 Anesthesia Foundation Distinguished Trailblazer Award, Boston Children's Hospital
- 2015 Grand Prize and Audience Choice Award, MIT 100k Pitch Competition
- 2011 NIH Ruth Kirschstein National Research Service Award
- 2008 Gold Award, Materials Research Society
- 2007 Finalist, National Collegiate Inventors Competition
- 2002 NSF Graduate Research Fellowship
- 2000 Barry M. Goldwater Scholarship
- 2000 Rotary Foundation Ambassadorial Scholarship

## Teaching and Mentoring Activities

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|-----------|--|
| 2016      | Course Instructor for BME 5, Junior Design and Research I, Tufts University                              |
| 2009-2015 | Research Mentor for undergraduate students in Kohane and Langer Groups, MIT / Boston Children's Hospital |
| 2002-2009 | Research Mentor for undergraduate students in Lieber Group, Harvard University                           |
| 2002      | Teaching Fellow for CHM 60, Principles of Physical Chemistry, Harvard University                         |

## Other Professional / Service Experience

**Membership in professional societies:** American Chemical Society, Materials Research Society, American Institute of Chemical Engineers, Alpha Chi Sigma, Sigma Xi

**Peer reviewer for journals (ad hoc):** *Nano Letters, ACS Nano, PNAS, Nature Medicine, Biomacromolecules, Acta Biomaterialia, Nanoscale, Nanomedicine, Current Opinion in Biotechnology*

**First-round Judge:** *National Collegiate Inventors Competition*

**Session co-chair:** *World Biomaterials Conference, Montreal, May 17-22, 2016*

## **Publications - Original Research**

15. C. Zhan, W. Wang, J.B. McAlvin, S. Guo, **B.P. Timko**, C. Santamaria & D.S. Kohane, "Phototriggered local anesthesia." *Nano Lett.*, **13**, 177 (2016).
14. I.P. Monteiro, D. Gabriel, **B.P. Timko**, M. Hashimoto, S. Karajanagi, R. Tong, A.P. Marques, R.L. Reis, D.S. Kohane, "A two-component pre-seeded dermal-epidermal scaffold," *Acta Biomater.*, **10**, 4928 (2015).
13. **B.P. Timko**, M. Arruebo, S.A. Shankarappa, J. B. McAlvin, O.S. Okonkwo, B. Mizrahi, C. Stefanescu, L. Gomez, J. Zhu, A. Zhu, J. Santamaria, R. Langer & D.S. Kohane, "Near-infrared Actuated Devices for Remotely Controlled Drug Delivery," *Proc. Natl. Acad. Sci. USA*, **111**, 1349 (2014). **Featured as "Editors' Choice," *Science Translational Medicine* (12 Feb. 2014) and in "The Distillery," *Nature / Science-Business eXchange (SciBX)*.**
12. B. Mizrahi, S.A. Shankarappa, J. Hickey, J. Dohlman, **B.P. Timko**, K.A. Whitehead, J-J. Lee, R. Langer, D.G. Anderson & Daniel S. Kohane, "A Stiff Injectable Biodegradable Elastomer," *Adv. Funct. Mater.* **23**, 1527 (2013).
11. **B.P. Timko\***, T. Dvir\*, M.D. Brigham, S.R. Naik, S.S. Karajanagi, O. Levy, H. Jin, K.K. Parker, R. Langer & D.S. Kohane, "Nanowired three-dimensional cardiac patches," *Nature Nanotechnol.* **6**, 720 (2011). (\*I am listed second on this paper but with equal first contribution.)
10. **B.P. Timko\***, T. Hoare, J. Santamaria, G.F. Goya, S. Irusta, S. Lau, C.F. Stefanescu, D. Lin, R. Langer & D.S. Kohane, "Magnetically Triggered Nanocomposite Membranes: A Versatile Platform for Triggered Drug Release," *Nano. Lett.* **11**, 1395 (2011). (\*I am listed second on this paper but with equal first contribution)
9. T. Dvir, M.R. Banghart, **B.P. Timko**, R. Langer & D.S. Kohane, "Photo-Targeted Nanoparticles," *Nano Lett.* **10**, 250 (2010).
8. **B.P. Timko**, T. Cohen-Karni, Guihua Yu & C.M. Lieber, "Electrical Recording from Hearts using Flexible Nanowire Device Arrays." *Nano. Lett.* **9**, 914 (2009).
7. T. Cohen-Karni, **B.P. Timko**, L.E. Weiss & C.M. Lieber, "Flexible electrical recording from cells using nanowire transistor arrays," *Proc. Natl. Acad. Sci. USA* **106**, 7309 (2009).
6. **B.P. Timko\***, F. Patolsky,\* G. Yu, Y. Fang, A.B. Greytak, G. Zheng & C.M. Lieber, "Detection, Stimulation, and Inhibition of Neuronal Signals with High-Density Nanowire Transistor Arrays," *Science*. **313**, 1100 (2006). (\*I am listed second on this paper but with equal first contribution) **Featured as one of the "Top Five Nanotech Breakthroughs of 2006" in the *Forbes/Wolfe Nanotechnology Report* and "The Top 100 Science Stories in 2006" in *Discover Magazine*.**
5. Q. Qing, S. K. Pal, B. Tian, X. Duan, **B.P. Timko**, T. Cohen-Karni, V.N. Murthy & C.M. Lieber, "Nanowire transistor arrays for mapping neural circuits in acute brain slices," *Proc. Natl. Acad. Sci. USA* **107**, 1882 (2010).
4. W. Lu, J. Xiang, **B.P. Timko**, Y. Wu & C.M. Lieber, "One-dimensional hole gas in germanium/silicon nanowire heterostructures," *Proc. Natl. Acad. Sci. USA* **102**, 10046 (2005).
3. D. C. Bell, Y. Wu, C. J. Barrelet, S. Gradecak, J. Xiang, **B.P. Timko** & C. M. Lieber, "Imaging and Analysis of Nanowires," *Microsc. Res. Techniq.* **64**, 373 (2004).
2. T. Reuther, V. M. Hultgren, **B.P. Timko**, A. M. Bond, W. R. Jackson & A. G. Wedd. "Electrochemical Investigation of Photooxidation Processes Promoted by Sulfo-polyoxometalates: Coupling of Photochemical and Electrochemical Processes into an Effective Catalytic Cycle," *J. Am. Chem. Soc.* **125**, 10133 (2003).
1. M. C. Henry, C.-C. Hsueh, **B.P. Timko** & M. S. Freund. "Reaction of Pyrrole and Chlorauric Acid: a New Route to Composite Colloids," *J. Electrochem. Soc.* **148**, K155 (2001).

## **Publications – Reviews and Editorial**

9. **B.P. Timko** & D.S. Kohane (Editorial): "Prospects for near-infrared technology in remotely-triggered drug delivery," *Expert Opin. Drug Del.*, **12**, 4928 (2014).
8. **B.P. Timko** & D.S. Kohane, "Drug Delivery Systems for Customized and Localized Drug Release," *Isrl. J. Chem.*, **53**, 728 (2013).

7. **B.P. Timko** & D.S. Kohane, "Materials to Clinical Devices: Technologies for Remotely-triggered Drug Delivery," *Clin. Ther.* **34**, S25 (2012).
6. T. Dvir, **B.P. Timko**, D.S. Kohane & R. Langer, "Tissue engineering in the era of nanotechnology," *Nat. Nanotechnol.* **6**, 13 (2011).
5. **B.P. Timko**, K. Whitehead, W. Gao, D. Kohane, O. Farokhzad, D. Anderson & R. Langer, "Advances in Drug Delivery," *Ann. Rev. Mater. Res.*, **41**, 1 (2011).
4. **B.P. Timko**, T. Dvir & D.S. Kohane, "Remotely triggerable drug delivery systems," *Adv. Mater.* **22**, 4925 (2010).
3. **B.P. Timko**, T. Cohen-Karni, Q. Qing, B. Tian & C.M. Lieber, "Design and implementation of functional nanoelectronic interfaces with biomolecules, cells and tissue using nanowire device arrays," *IEEE Trans. Nanotechnol.* **9**, 269 (2010).
2. N.A. Kotov, I. Clements, J. Winter, **B.P. Timko**, E. Jan, S. Campidelli, S. Pathak, R.V. Bellamkonda, A. Mazzatenta, L. Ballerini, M. Prato, F. Patolsky, C.M. Lieber, D. Da Silva, N.W.S. Kam, A. Curtis, A. Beattie, C.D.W. Wilkinson & M. Riehle, "Nanomaterials for Neural Interfaces," *Adv. Mater.* **21**, 3970 (2009).
1. F. Patolsky, **B.P. Timko**, G. Zheng & C.M. Lieber, "Nanowire-Based Nanoelectronic Devices in the Life Sciences," *MRS Bull.* **32**, 142 (2007).

### Articles

2. **B.P. Timko**, D.S. Kohane, "Remote Controlled Drugs," *The Medicine Maker*, Issue #0315, April 9, 2015.
1. **B.P. Timko**, D.S. Kohane, Research Highlights, *Nanomedicine* **7**, 315 (2012).

### Patents

3. T. Dvir, D.S. Kohane, R.S. Langer & **B.P. Timko**, "Nanowired Three Dimensional Tissue Scaffolds," U.S. Patent, US9114009B2, granted 25 August 2015.
2. F. Patolsky, **B.P. Timko**, G. Yu & C.M. Lieber, "Nanobioelectronics," U.S. Patent Pending, US12225142, filed 15 September 2008.
1. C.M. Lieber, W. Lu, J. Xiang, Y. Wu, **B.P. Timko** & H. Yan, "Nanowire Heterostructures," U.S. Patent, US7858965B2, granted 28 December 2010.

### Ongoing Research Support

1R01GM116920-01 (Kohane / Boston Children's Hospital)  
NIH, NIGMS

9/2015-8/2020

#### **Nanoparticle-driven Systems for Tunable Local Pain Relief**

The goal of this research is to develop injectable and implantable systems that allow near-infrared-triggered on demand local pain relief.

**Role: Co-Investigator**

### Past Research Support

F32 GM096546 (Timko)  
NIH, NIGMS

01/2011-12/2012

#### **A Photo-triggered On-demand Drug Delivery System**

The goal of this study is to design polymer membrane and microparticle systems that release drug in response to near-infrared laser irradiation.

**Role: Postdoc/PI**