Curriculum Vitae

ALEXANDER A. GREEN

Biodesign Center for Molecular Design and Biomimetics
The Biodesign Institute
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EMPLOYMENT

2015- **Arizona State University,** *Assistant Professor*
Biodesign Center for Molecular Design and Biomimetics, The Biodesign Institute
School of Molecular Sciences

EDUCATION

2010-2014 **Wyss Institute at Harvard University,** *Postdoctoral Fellow*
Advisors: Peng Yin and James J. Collins
Research area: Synthetic biology and nucleic acid nanotechnology

2005-2010 **Northwestern University**
Ph.D. in Materials Science and Engineering
Advisor: Mark C. Hersam
Research area: Production and application of monodisperse carbon nanomaterials

2001-2005 **University of Toronto**
B.A.Sc. with Honours in Engineering Science, Nanoengineering Option
Advisors: Edward H. Sargent and R. J. Dwayne Miller
Research area: Photonic crystals and femtosecond electron diffraction

FELLOWSHIPS AND AWARDS

2019	DARPA Young Faculty Award Director's Fellowship
2017	NIH New Innovator Award
2017	DARPA Young Faculty Award
2017	Alfred P. Sloan Research Fellow in Computational & Evolutionary Molecular Biology
2017	Arizona Biomedical Research Commission New Investigator Award
2017	Distinction of Merit and Scholastic Occupation (DMSO) Teaching Award by the ASU Student Affiliates of the American Chemical Society (SAACS)
2017	Finalist, Moore Inventor Fellows program
2016	Gates Foundation Grand Challenges Explorations Award
2016	Finalist, Damon Runyon-Rachleff Innovation Award
2016	POPULAR SCIENCE Best of What's New Award in Health for Rapid Zika Test
2016	Katerva Award Finalist for Zika Test
2009-2010	Northwestern University Terminal Year Graduate Fellowship
2006-2009	NSERC Postgraduate Scholarship – Doctoral Level
2005-2006	NSERC Postgraduate Scholarship – Master's Level
2005	Northwestern University Cabell Fellowship (declined)
2005	DuPont-MIT Alliance Fellowship (declined)
2004	Engineering Science Academic Excellence Award
2003, 2004	University of Toronto Scholarships
2003, 2004	NSERC Undergraduate Student Research Awards
2002	Paulin Memorial Scholarship
2001	University of Toronto Scholarship
2001	Walter Scott Guest Memorial Scholarship
2001	James A. Gow Scholarship

I. SCHOLARSHIP

I.1. PUBLICATIONS

* indicates corresponding author(s) for publications as an ASU faculty member
Underlined names correspond to Green group graduate students
Italicized names correspond to students in other ASU groups
[1] indicates co-first authors
° indicates invited article
[c] indicates a cover article

Google Scholar: http://scholar.google.com/citations?user=8zJRDjkAAAAJ&hl=en

Total Publications: 61, Total Citations: 8568, H-Index: 39

A. Publications as an ASU faculty member

64. °**A. A. Green***, "Synthetic Bionanotechnology: Synthetic Biology Finds a Toehold in Nanotechnology," in revision at ***Emerging Topics in Life Science***s.

63. J. Kim[1], Y. Zhou[1], P. Carlson, M. Teichmann, S. Chaudhary, F. C. Simmel, P. A. Silver, J. J. Collins, J. B. Lucks, P. Yin* & **A. A. Green***, "De-Novo-Designed Translation-Repressing Riboregulators for Multi-Input Cellular Logic," in press at ***Nature Chemical Biology***.
bioRxiv pre-print: https://www.biorxiv.org/content/early/2018/12/19/501783

62. *D. O. Li*, M. S. Gilliam, *X. S. Chu*, A. Yousaf, *Y. Guo*, **A. A. Green** & Q. H. Wang*, "Covalent chemical functionalization of semiconducting layered chalcogenide nanosheets," ***Molecular Systems Design & Engineering*** **4**, 962-973 (2019)

61. D. Ma, L. Shen, K. Wu, C. W. Diehnelt & **A. A. Green***, "Low-Cost Detection of Norovirus Using Paper-Based Cell-Free Systems and Synbody-Based Viral Enrichment," ***Synthetic Biology*** **3** (1), ysy018 (2018).

60. *X. S. Chu*, A. Yousaf, *D. O. Li*, A. A. Tang, A. Debnath, D. Ma, **A. A. Green***, E. J. G. Santos* & Q. H. Wang*, "Direct Covalent Chemical Functionalization of Unmodified Two-Dimensional Molybdenum Disulfide," ***Chemistry of Materials*** **30**, 2112-2128 (2018). [Impact factor = 9.890]

59. J. Kim, P. Yin* & **A. A. Green***, "Ribocomputing: Cellular Logic Computation Using RNA Devices," ***Biochemistry*** **57**, 883-885 (2017).

58. *X. S. Chu*, *D. O. Li*, **A. A. Green** & Q. H. Wang[†], "Formation of MoO_3 and WO_3 Nanoscrolls from MoS_2 and WS_2 by Atmospheric Air Plasma," ***Journal of Materials Chemistry C*** **5**, 11301-11309 (2017).

57. J. Li, **A. A. Green***, H. Yan* & C. Fan*, "DNA nanotechnology for programmable molecular circuitry and intracellular biocomputation," ***Nature Chemistry*** **9**, 1056-1067 (2017). [Impact factor = 25.870]
    - Times cited: 67

56. **A. A. Green***[,1], J. Kim[1], D. Ma, P. A. Silver, J. J. Collins & P. Yin*, "Complex cellular logic computation using ribocomputing devices," ***Nature 548***, 117-121 (2017). [Impact factor = 40.137]
    - Demonstrated an RNA-only strategy for biocomputing in *E. coli*
    - Technique was used to evaluate a 12-input logical expression in live cells
    - Times cited: 96

55. K. Pardee[1], **A. A. Green**[1], M. K. Takahashi[1], D. Braff[1], G. Lambert[1], J. W. Lee, T. Ferrante, D. Ma, N. Donghia, M. Fan, N. M. Daringer, I. Bosch, D. M. Dudley, D. H. O'Connor, L. Gehrke & J. J. Collins*, "Rapid, Low-Cost Detection of Zika Virus Using Programmable Biomolecular Components," ***Cell*** **165**, 1255-1266 (2016). [Impact factor = 28.710]
    - Demonstrated that freeze-dried, room-temperature-stable biomolecular components can be used to detect the Zika virus at clinically relevant concentrations.
    - Provide portable nucleic acid diagnostic capabilities at $1 per test.
    - A period of only 6 weeks was required to develop and validate a successful prototype.
    - Times cited: 311

54. *J. Appel*, *D. O. Li*, *J. Podlevsky*, A. Debnath, **A. A. Green**, Q. H. Wang & Junseok Chae*, "Low Cytotoxicity and Genotoxicity of Two-Dimensional MoS_2 and WS_2," ***ACS Biomater. Sci. Eng.*** **2**, 361-367 (2016). [Impact factor = 3.234]
    - Times cited: 51

B. Postdoctoral Publications

53. **A. A. Green,** P. A. Silver, J. J. Collins & P. Yin, "Toehold Switches: De-Novo-Designed Regulators of Gene Expression," ***Cell*** **159**, 925-939 (2014). [Impact factor = 28.710]
    - Use first-principles considerations and *in silico* sequence design to generate synthetic RNA switches with high dynamic range and orthogonality.
    - Toehold switches provide >400-fold modulation of gene expression in *E. coli* and can be used for endogenous RNA sensing and complex circuit construction.
    - Highlighted in: "Synthetic biology: Toehold gene switches make big footprints", S. Ausländer & M. Fussenegger, ***Nature*** **516**, 333-334 (2014)
    - Highlighted in "De novo–designed riboregulators", N. Rusk, ***Nature Meth.*** **11**, 1192-1193 (2014).
    - Times cited: 306

52. K. Pardee, **A. A. Green,** T. Ferrante, D. E. Cameron, A. DaleyKeyser, P. Yin & J. J. Collins, "Paper-based Synthetic Gene Networks," ***Cell*** **159**, 940-954 (2014). [Impact factor = 28.710]
    - Demonstrate that cell-free systems can be embedded onto paper and remain functional even after storage at room temperature
    - Accompanying Preview article: "Synthetic Biology Looks Good on Paper", A. J. Lopatkin & L. You, ***Cell*** **159**, 718-720 (2014).
    - Times cited: 296

C. Graduate Publications

51. J.-W. T. Seo, N. L. Yoder, T. A. Shastry, J. J. Humes, J. E. Johns, **A. A. Green** & M. C. Hersam, "Diameter refinement of semiconducting arc discharge single-walled carbon nanotubes via density gradient ultracentrifugation," *J. Phys. Chem. Lett.* **4**, 2805-2810 (2013).

50. M. E. Regler, H. J. Krenner, **A. A. Green**, M. C. Hersam, A. Wixforth & A. Hartschuh, "Controlling exciton decay dynamics in semiconducting single-walled carbon nanotubes by surface acoustic waves," *Chem. Phys.* **413**, 39-44 (2013).

49. J. Huang, A. Ng, Y. M. Piao, C.-F. Chen, **A. A. Green**, C.-F. Sun, M. C. Hersam, C. Lee & Y. H. Wang, "Covalently functionalized double-walled carbon nanotubes combine high sensitivity and selectivity in the electrical detection of small molecules," *J. Am. Chem. Soc.* **135**, 2306-2312 (2013).

48. A. L. Antaris, J.-W. T. Seo, R. E. Brock, J. E. Herriman, M. J. Born, **A. A. Green** & M. C. Hersam, "Probing and Tailoring pH-Dependent Interactions between Block Copolymers and Single-Walled Carbon Nanotubes for Density Gradient Sorting," *J. Phys. Chem. C* **116**, 20103-20108 (2012).

47. M. Engel, M. Steiner, R. S. Sundaram, R. Krupke, **A. A. Green**, M. C. Hersam & P. Avouris, "Spatially Resolved Electrostatic Potential and Photocurrent Generation in Carbon Nanotube Array Devices," *ACS Nano* **6**, 7303-7310 (2012).

46. M. Steiner, M. Engel, Y.-M. Lin, Y. Wu, K. Jenkins, D. B. Farmer, J. J. Humes, N. L. Yoder, J.-W. T. Seo, **A. A. Green**, M. C. Hersam, R. Krupke & P. Avouris, "High-frequency performance of scaled carbon nanotube array field-effect transistors," *Appl. Phys. Lett.* **101**, 053123 (2012).

45. M. W. Graham, T. R. Calhoun, **A. A. Green**, M. C. Hersam & G. R. Fleming, "Two-Dimensional Electronic Spectroscopy Reveals the Dynamics of Phonon-Mediated Excitation Pathways in Semiconducting Single-Walled Carbon Nanotubes," *Nano Lett.* **12**, 813-819 (2012).

44. D. M. Harrah, J. R. Schneck, **A. A. Green**, M. C. Hersam, L. D. Ziegler & A. K. Swan, "Intensity-Dependent Exciton Dynamics of (6,5) Single-Walled Carbon Nanotubes: Momentum Selection Rules, Diffusion, and Nonlinear Interactions," *ACS Nano* **5**, 9898-9906 (2011).

43. M. Kalbac, **A. A. Green**, M. C. Hersam & L. Kavan, "Probing charge transfer between shells of double-walled carbon nanotubes sorted by outer-wall electronic type," *Chem. Eur. J.* **17**, 9806-9815 (2011).

42. Y. M. Piao, C.-F. Chen, **A. A. Green**, H. Kwon, M. C. Hersam, C. S. Lee, G. C. Schatz & Y. H. Wang, "Optical and Electrical Properties of Inner Tubes in Outer Wall-Selectively Functionalized Double-Wall Carbon Nanotubes," *J. Phys. Chem. Lett.* **2**, 1577-1582 (2011).

41. [c]**A. A. Green** & M. C. Hersam, "Nearly Single-Chirality Single-Walled Carbon Nanotubes Produced via Orthogonal Iterative Density Gradient Ultracentrifugation," *Adv. Mater.* **23**, 2185-2190 (2011).
    - Fabricated high performance thin-film transistors with field-effect mobilities up to 17 cm^2/V-s and on/off ratios approaching 10^5 using carbon nanotubes sharing identical atomic structures
    - Times cited: 184

40. M. W. Graham, J. Chmeliov, Y. Z. Ma, H. Shinohara, **A. A. Green**, M. C. Hersam, L. Valkunas & G. R. Fleming, "Exciton Dynamics in Semiconducting Carbon Nanotubes," *J. Phys. Chem. B* **115**, 5201-5211 (2011).

39. J.-W. T. Seo[1], **A. A. Green**[1], A. L. Antaris & M. C. Hersam, "High-Concentration Aqueous Dispersions of Graphene Using Nonionic, Biocompatible Block Copolymers," *J. Phys. Chem. Lett.* **2**, 1004-1008 (2011).
    - Discovered that high concentration dispersions of graphene can be produced using several block copolymers. These dispersions enable application of graphene in biological contexts.
    - Times cited: 156

38. J. R. Schneck, A. G. Walsh, **A. A. Green**, M. C. Hersam, L. D. Ziegler & A. K. Swan, "Electron Correlation Effects on the Femtosecond Dephasing Dynamics of E_{22} Excitons in (6,5) Carbon Nanotubes," *J. Phys. Chem. A* **115**, 3917-3923 (2011).

37. M. Ganzhorn, A. Vijayaraghavan, **A. A. Green**, S. Dehm, A. Voigt, M. Rapp, M. C. Hersam & R. Krupke, "A Scalable, CMOS-Compatible Assembly of Ambipolar Semiconducting Single-Walled Carbon Nanotube Devices," *Adv. Mater.* **23**, 1734-1738 (2011).

36. R. W. Newson, **A. A. Green**, M. C. Hersam & H. M. van Driel, "Coherent injection and control of ballistic charge currents in single-walled carbon nanotubes and graphite," *Phys. Rev. B* **83** (2011).

35. M. Ganzhorn, A. Vijayaraghavan, S. Dehm, F. Hennrich, **A. A. Green**, M. Fichtner, A. Voigt, M. Rapp, H. von Lohneysen, M. C. Hersam, M. M. Kappes & R. Krupke, "Hydrogen Sensing with Diameter- and Chirality-Sorted Carbon Nanotubes," *ACS Nano* **5**, 1670-1676 (2011).

34. **A. A. Green** & M. C. Hersam, "Properties and Application of Double-Walled Carbon Nanotubes Sorted by Outer-Wall Electronic Type," ***ACS Nano* 5**, 1459-1467 (2011).
    - Produced the first high purity samples of electronically monodisperse double-walled carbon nanotubes. Characterized thin-film transistors fabricated from these unique materials.
    - Times cited: 80

33. M. W. Graham, Y. Z. Ma, **A. A. Green**, M. C. Hersam & G. R. Fleming, "Pure optical dephasing dynamics in semiconducting single-walled carbon nanotubes," *J. Chem. Phys.* **134** (2011).

32. S. You, M. Mases, I. Dobryden, **A. A. Green**, M. C. Hersam & A. V. Soldatov, "Probing structural stability of double-walled carbon nanotubes at high non-hydrostatic pressure by Raman spectroscopy," *High Pressure Res.* **31**, 186-190 (2011).

31. M. Kinoshita, M. Steiner, M. Engel, J. P. Small, **A. A. Green**, M. C. Hersam, R. Krupke, E. E. Mendez & P. Avouris, "The polarized carbon nanotube thin film LED," *Opt. Express* **18**, 25738-25745 (2010).

30. C. Georgi, **A. A. Green**, M. C. Hersam & A. Hartschuh, "Probing Exciton Localization in Single-Walled Carbon Nanotubes Using High-Resolution Near-Field Microscopy," *ACS Nano* **4**, 5914-5920 (2010).

29. M. Bohmler, N. Hartmann, C. Georgi, F. Hennrich, **A. A. Green**, M. C. Hersam & A. Hartschuh, "Enhancing and redirecting carbon nanotube photoluminescence by an optical antenna," *Opt. Express* **18**, 16443-16451 (2010).

28. M. J. Ha, Y. Xia, **A. A. Green**, W. Zhang, M. J. Renn, C. H. Kim, M. C. Hersam & C. D. Frisbie, "Printed, Sub-3V Digital Circuits on Plastic from Aqueous Carbon Nanotube Inks," *ACS Nano* **4**, 4388-4395 (2010).

27. A. L. Antaris, J.-W. T. Seo, **A. A. Green** & M. C. Hersam, "Sorting Single-Walled Carbon Nanotubes by Electronic Type Using Nonionic, Biocompatible Block Copolymers," *ACS Nano* **4**, 4725-4732 (2010).

26. G. M. Mutlu, G. R. S. Budinger, **A. A. Green**, D. Urich, S. Soberanes, S. E. Chiarella, G. F. Alheid, D. McCrimmon, I. Szleifer & Mark C. Hersam, "Biocompatible Nanoscale Dispersion of Single Walled Carbon Nanotubes Minimizes in vivo Pulmonary Toxicity," *Nano Lett.* **10**, 1664-1670 (2010).

25. S. Essig, C. W. Marquardt, A. Vijayaraghavan, M. Ganzhorn, S. Dehm, F. Hennrich, F. Ou, **A. A. Green**, C. Sciascia, F. Bonaccorso, K.-P. Bohnen, H. v. Löhneysen, M. M. Kappes, P. Ajayan, M. C. Hersam, Mark, A. C. Ferrari, & R. Krupke, "Phonon assisted electroluminescence from metallic carbon nanotubes and graphene," *Nano Lett.* **10**, 1589-1594 (2010).

24. °,ᶜ**A. A. Green** & M. C. Hersam, "Emerging Methods for Producing Monodisperse Graphene Dispersions," *J. Phys. Chem. Lett.* **1**, 544-549 (2010).
    - Perspective on methods of dispersing graphene with controlled lateral dimensions and thickness, and the importance of monodisperse graphene.
    - Times cited: 193

23. M. Kalbac, **A. A. Green**, M. C. Hersam & L. Kavan, "Tuning of Sorted Double-Walled Carbon Nanotubes by Electrochemical Charging," *ACS Nano* **4**, 459-469 (2010).

22. **A. A. Green** & M. C. Hersam, "Solution Phase Production of Graphene with Controlled Thickness via Density Differentiation," *Nano Lett.* **9**, 4031-4036 (2009).
    - First paper to demonstrate solution-phase separation of graphene flakes by atomic layer thickness, an important step toward applications of graphene with tailored optical and electronic properties.
    - Times cited: 707

21. H. Harutyunyan, T. Gokus, **A. A. Green**, M. C. Hersam, M. Allegrini & A. Hartschuh, "Photoluminescence from disorder induced states in individual single-walled carbon nanotubes," *Phys. Status Solidi B* **246**, 2679-2682 (2009).

20. A. V. Naumov, O. A. Kuznetsov, A. R. Harutyunyan, **A. A. Green**, M. C. Hersam, D. E. Resasco, P. N. Nikolaev & R. B. Weisman, "Quantifying the Semiconducting Fraction in Single-Walled Carbon Nanotube Samples through Comparative Atomic Force and Photoluminescence Microscopies," *Nano Lett.* **9**, 3203-3208 (2009).

19. L. Nougaret, H. Happy, G. Dambrine, V. Derycke, J. P. Bourgoin, **A. A. Green** & M. C. Hersam, "80 GHz field-effect transistors produced using high purity semiconducting single-walled carbon nanotubes," *Appl. Phys. Lett.* **94** (2009).

18. H. Harutyunyan, T. Gokus, **A. A. Green**, M. C. Hersam, M. Allegrini & A. Hartschuh, "Defect-Induced Photoluminescence from Dark Excitonic States in Individual Single-Walled Carbon Nanotubes," *Nano Lett.* **9**, 2010-2014 (2009).

17. [c]**A. A. Green** & M. C. Hersam, "Processing and properties of highly enriched double-wall carbon nanotubes," ***Nature Nanotech.*** **4**, 64-70 (2009).
    - First paper to demonstrate the isolation of double-wall carbon nanotubes from a polydisperse sample, a key development for application of double-wall carbon nanotubes.
    - Times cited: 209

16. [c]**A. A. Green**, M. C. Duch & M. C. Hersam, "Isolation of single-walled carbon nanotube enantiomers by density differentiation," *Nano Res.* **2**, 69-77 (2009).
    - First report to use density differentiation to extract left- and right-handed carbon nanotubes from a racemic initial population.
    - Times cited: 171

15. M. Engel, J. P. Small, M. Steiner, M. Freitag, **A. A. Green**, M. C. Hersam & P. Avouris, "Thin Film Nanotube Transistors Based on Self-Assembled, Aligned, Semiconducting Carbon Nanotube Arrays," *ACS Nano* **2**, 2445-2452 (2008).

14. Y. Z. Ma, M. W. Graham, G. R. Fleming, **A. A. Green** & M. C. Hersam, "Ultrafast Exciton Dephasing in Semiconducting Single-Walled Carbon Nanotubes," *Phys. Rev. Lett.* **101**, 217402 (2008).

13. O. Frank, L. Kavan, **A. A. Green**, M. C. Hersam & L. Dunsch, "In-situ Vis/NIR spectroelectrochemistry of single-walled carbon nanotubes enriched with (6,5) tubes," *Phys. Status Solidi B* **245**, 2239-2242 (2008).

12. H. H. Qian, C. Georgi, N. Anderson, **A. A. Green**, M. C. Hersam, L. Novotny & A. Hartschuh, "Exciton transfer and propagation in carbon nanotubes studied by near-field optical microscopy," *Phys. Status Solidi B* **245**, 2243-2246 (2008).

11. H. Qian, P. T. Araujo, C. Georgi, T. Gokus, N. Hartmann, **A. A. Green**, A. Jorio, M. C. Hersam, L. Novotny & A. Hartschuh, "Visualizing the local optical response of semiconducting carbon nanotubes to DNA-wrapping," *Nano Lett.* **8**, 2706-2711 (2008).

10. L. Kavan, O. Frank, **A. A. Green**, M. C. Hersam, J. Koltai, V. Zolyomi, J. Kurti & L. Dunsch, "In situ Raman spectroelectrochemistry of single-walled carbon nanotubes: Investigation of materials enriched with (6,5) tubes," *J. Phys. Chem. C* **112**, 14179-14187 (2008).

9. C. Georgi, N. Hartmann, T. Gokus, **A. A. Green**, M. C. Hersam & A. Hartschuh, "Photoinduced luminescence blinking and bleaching in individual single-walled carbon nanotubes," *ChemPhysChem* **9**, 1460-1464 (2008).

8. H.H. Qian, C. Georgi, N. Anderson, **A.A. Green**, M.C. Hersam, L. Novotny & A. Hartschuh, "Exciton energy transfer in pairs of single-walled carbon nanotubes," *Nano Lett.* **8**, 1363-1367 (2008).

7. **A. A. Green** & M. C. Hersam, "Colored semitransparent conductive coatings consisting of monodisperse metallic single-walled carbon nanotubes," *Nano Lett.* **8**, 1417-1422 (2008).
    - Produced colorful “stained glass” transparent conductors with 5-fold higher conductivity using metallic carbon nanotubes sorted with angstrom-level resolution in diameter.
    - Work featured as Research Highlight in “Tube Conductors”, *Nature* **452**, 668 (2008)
    - Times cited: 373

6. T. Gokus, A. Hartschuh, H. Harutyunyan, M. Allegrini, F. Hennrich, M. Kappes, **A.A. Green**, M.C. Hersam, P.T. Araujo & A. Jorio, "Exciton decay dynamics in individual carbon nanotubes at room temperature," *Appl. Phys. Lett.* **92**, 153116 (2008).

5. °**A.A. Green** & M. C. Hersam, "Ultracentrifugation of single-walled nanotubes," *Mater. Today* **10**, 59-60 (2007).

4. M. S. Arnold, **A. A. Green**, J. F. Hulvat, S. I. Stupp & M. C. Hersam, "Sorting carbon nanotubes by electronic structure using density differentiation," ***Nature Nanotech.*** **1**, 60-65 (2006).
    - Accompanying News & Views article: “Materials processing: Sorting out carbon nanotube electronics”, A. G. Rinzler, *Nature Nanotech.* **1**, 17-18 (2006).
    - Times cited: 2276

D. Undergraduate Publications

3. **A. A. Green**, E. Istrate & E. H. Sargent, "Efficient design and optimization of photonic crystal waveguides and couplers: The Interface Diffraction Method," *Opt. Express* **13**, 7304-7318 (2005).

2. E. Istrate, **A. A. Green** & E. H. Sargent, "Behavior of light at photonic crystal interfaces," *Phys. Rev. B* **71**, 195122 (2005).

1. B. J. Siwick, **A. A. Green**, C. T. Hebeisen & R. J. D. Miller, "Characterization of ultrashort electron pulses by electron-laser pulse cross correlation," *Opt. Lett.* **30**, 1057-1059 (2005).

I.2. INVITED BOOK CHAPTERS

2. A. Tinafar, Y. Zhou, F. Hong, K. L. Swingle, A. A. Tang, **A. A. Green*** & Keith Pardee*, “Cell-Free Biosensors: Synthetic Biology Without Borders” *Handbook of Cell Biosensors*, in press.

1. **A. A. Green***, “Construction and *In Vivo* Testing of Prokaryotic Riboregulators,” *Methods in Molecular Biology*, RNA Nanostructures Issue, 2017.

I.3. SELECTED PRESS COVERAGE

A. Ribocomputing Devices [Green et al., Nature 548, 117-121 (2017)]:

- "Complex Biological Computer Commands Living Cells" by Emily Waltz, IEEE Spectrum: https://spectrum.ieee.org/the-human-os/biomedical/devices/biological-computer-commands-living-cells-to-light-up
- "RNA used to make 'living computers' for nanotechnology" by Tim Sandle, Digital Journal: http://www.digitaljournal.com/tech-and-science/science/rna-circuits-transform-cells-into-nanodevices/article/498704
- "Hacked E. Coli Shows the Promise of Programmable Biology" by Michael Byrne, Motherboard: https://motherboard.vice.com/en_us/article/pad5d8/hacked-e-coli-shows-the-promise-of-programmable-biology
- "RNA circuits transform cells into nanodevices with 12 input logic" by Brian Wang, Next Big Future: https://www.nextbigfuture.com/2017/07/rna-circuits-transform-cells-into-nanodevices-with-12-input-logic.html
- "Synthetic Biology Creates Living Computers" by Al Williams, Hackaday: https://hackaday.com/2017/08/09/synthetic-biology-creates-living-computers/
- "Living Computers: RNA Circuits Transform Cells Into Nanodevices" by Richard Harth, ASU Press Release: https://www.biodesign.asu.edu/news/living-computers-rna-circuits-transform-cells-nanodevices
- "Programming cells with computer-like logic" by Benjamin Boettner, Wyss Institute Press Release: https://wyss.harvard.edu/programming-cells-with-computer-like-logic/

B. Low-Cost, Paper-Based Zika Test [Pardee, Green, et al., Cell 165, 1255-1266 (2016)]:

- "Scientists reveal low-cost test for Zika" by Richard Harth, ASU Press Release: https://asunow.asu.edu/20160506-solutions-scientists-reveal-low-cost-test-zika
    - Selected as one of ASU's top stories of 2016: https://asunow.asu.edu/20161219-sun-devil-life-asus-year-review-2016
- "Arizona State University developing affordable Zika virus test" by Kathy Cline, KTAR News: http://ktar.com/story/1070332/arizona-state-university-developing-affordable-zika-virus-test/
- "Rapid Zika test introduced by researchers" by Donald G. McNeil Jr., New York Times: https://www.nytimes.com/2016/05/07/health/rapid-zika-test-is-introduced-by-researchers.html?_r=0
- "New fast, cheap test for Zika Virus" by David Common, CBC: http://www.cbc.ca/news/thenational/new-fast-cheap-test-for-zika-virus-1.3616201
- "Scientists develop method to test for Zika Virus" by Jessica Hartogs, CNBC: https://www.cnbc.com/2016/05/10/scientists-develop-method-to-test-for-zika-virus.html
- "Low-Cost Paper Diagnostic Test May Reduce Spread Of Zika Virus" by Rina Marie Doctor, IBT Tech Times: http://www.techtimes.com/articles/157127/20160510/low-cost-paper-diagnostic-test-may-reduce-spread-of-zika-virus.htm
- "Researchers Develop Low-Cost Paper Diagnostic Test For Zika Virus" by Jennifer Kite-Powell, Forbes: https://www.forbes.com/sites/jenniferhicks/2016/05/09/researchers-develop-low-cost-paper-diagnostic-test-for-zika-virus/#d7551733fb45
- "New low-cost Zika test looks good on paper" by Michael Irving, New Atlas: http://newatlas.com/low-cost-paper-based-zika-test/43229/
- "This Piece of Paper Can Diagnose Zika Incredibly Fast" by George Dvorsky, Gizmodo: http://gizmodo.com/this-piece-of-paper-can-diagnose-zika-incredibly-fast-1775161783
- "Cheap, Paper-Based Zika Diagnostic Tests Are Here" by Mike Orcutt, MIT Technology Review: https://www.technologyreview.com/s/601384/cheap-paper-based-zika-diagnostic-tests-are-here/
- "Zika portable test can detect virus" by Sheryl Ubelacker, Toronto Star: https://www.thestar.com/news/world/2016/05/06/zika-portable-test-can-rapidly-detect-help-contain-spread-of-virus-researchers.html

- "New test could detect Zika in hours" by Wency Leung, The Globe and Mail: https://beta.theglobeandmail.com/life/health-and-fitness/health/new-test-could-detect-zika-in-hours/article29910804/?ref=http://www.theglobeandmail.com&cmpid=rss1
- "Finding Zika one paper disc at a time" by Kat J. McAlpine, Wyss Institute Press Release: https://wyss.harvard.edu/finding-zika-one-paper-disc-at-a-time/

I.4. ISSUED PATENTS

A. Issued Patents from Work at ASU

5. X. Chu, A. Yousaf, **A. A. Green** & Q. H. Wang, "Method for Functionalizing Transition Metal Dichalcogenides," Granted U.S. Patent 10,155,782B2 December 18, 2018.

B. Issued Patents from Work Prior to ASU

4. **A. A. Green**, P. Yin & J. J. Collins, "Riboregulator Compositions and Methods of Use," PCT International Application PCT/US2013/068818 filed November 6, 2013. U.S. Patent Granted September 23, 2016.

3. A. L. Antaris, **A. A. Green** & M. C. Hersam, "Separation of Single-Walled Carbon Nanotubes by Electronic Type Using Block Copolymers," Granted U.S. Patent 9,034,213 May 19, 2015 and PCT International Application PCT/US2011/000979 filed May 31, 2011.

2. **A. A. Green** & M. C. Hersam, "Sorting Two-Dimensional Nanomaterials by Thickness," Granted U.S. Patent US8852444 B2, October 7, 2014, and PCT International Application PCT/US2010/045493 filed August 13, 2010.

1. **A. A. Green** & M. C. Hersam, "Transparent Electrical Conductors Prepared from Sorted Carbon Nanotubes and Methods of Preparing Same," Granted U.S. Patent US8323784 B2, December 4, 2012. Other applications: CA 2698093, EP20080795560, PCT/US2008/010046.

I.5. PATENT APPLICATIONS

A. Selected Patent Applications as an ASU Faculty Member

16. D. Ma, L. Shen, C. W. Diehnelt & **A. A. Green**, "Low-Cost Detection of Norovirus Using Paper-Based Cell-Free Systems and Synbody-Based Viral Enrichment," U. S. Provisional Patent Application No. 62/632,792 filed February 20, 2018.

15. D. O. Li, M. S. Gilliam, **A. A. Green** & Q. H. Wang, "Adsorption and Removal of Heavy Metal Ions from Water by Transition Metal Dichalcogenides," U. S. Provisional Patent Application No. 62/585,935 filed November 11, 2017.

14. A. Tang, D. Ma & **A. A. Green**, "Unimolecular Aptamer-Based Sensors for Pathogen Detection," U. S. Provisional Patent Application No. 62/408,846 filed October 17, 2016.

12. K. Pardee, **A. A. Green**, M. K. Takahashi, D. Braff, G. Lambert, T. Ferrante & J. J. Collins, "Portable, Low-Cost Virus Detection and Strain Identification Platform," U. S. Provisional Patent Application No. 62/403,778 filed October 4, 2016.

11. D. Ma & **A. A. Green**, "Loop-Mediated Synthetic Riboregulators," U. S. Provisional Patent Application No. 62/371,094 filed August 4, 2016.

10. F. Hong & **A. A. Green**, "Ultraspecific Riboregulators Having Robust Single-Nucleotide Specificity for *in Vitro* and *in Vivo* Diagnostics," U. S. Provisional Patent Application filed August 1, 2016.

9. Y. Zhou & **A. A. Green**, "Synthetic Near-Threshold Translational Repressors," U. S. Provisional Patent Application No. 62/369,521 filed August 1, 2016.

8. K. Pardee, **A. A. Green**, M. K. Takahashi, D. Braff, G. Lambert, T. Ferrante & J. J. Collins, "Portable, Low-Cost Virus Detection and Strain Identification Platform," U. S. Provisional Patent Application No. 62/341,221 filed May 25, 2016.

7. A. Tang & **A. A. Green**, "Synthetic Translation-Sensing Riboswitches," U. S. Provisional Patent Application No. 62/300,276 filed February 26, 2016.

6. A. Yousaf, A. Debnath & **A. A. Green**, "Method of Preparing Metal Diboride Dispersions and Thin Films," U. S. Provisional Patent Application No. 62/254,623 filed November 12, 2015.

B. Patent Applications from Work Prior to ASU

5. J. Kim, **A. A. Green** & Peng Yin, "Compositions Comprising Riboregulators and Methods of Use Thereof," U.S. Provisional Patent Application No. 62/256,015 filed November 16, 2015.

4. **A. A. Green**, P. Yin & J. J. Collins, "Toehold Switches Enable Wide Dynamic Range and Highly Orthogonal Regulation of Gene Expression," PCT International Application filed July 2014.

3. M. C. Hersam, J.-W. T. Seo**, A. A. Green**, & A. L. Antaris, "High-Concentration Aqueous Dispersions of Graphene Using Nonionic, Biocompatible Copolymers," U.S. Formal Patent Application US2014/0248214 filed March 14, 2013 and PCT International Application PCT/US2013/000070 filed March 14, 2013.

2. M. C. Hersam, A. L. Antaris, J.-W. T. Seo & **A. A. Green**, "Separation of Single-Walled Carbon Nanotubes by Self-Forming Density Gradient Ultracentrifugation," U.S. Formal Patent Application US2013/0040798 filed August 7, 2012 and PCT International Application PCT/US2012/049852 filed August 7, 2012.

1. **A. A. Green** & M. C. Hersam, "Methods for Sorting Nanotubes by Wall Number," U.S. Formal Patent Application US2010/0072458 and PCT International Application PCT/US2009/004499 filed August 5, 2009.

I.6. PRESENTATIONS

A. Invited Conference Presentations as an ASU Faculty Member

9. *(International)* **A. A. Green**, "RNA Nanodevices for Biocomputing and Diagnostics," Functional DNA Nanotechnology Workshop, Rome, Italy, June 6, 2018.

8. *(International)* **A. A. Green**, "RNA Nanodevices for Biocomputing and Diagnostics," 2018 Chemical Biophysics Symposium, University of Toronto, Toronto, Canada, May 4, 2018.

7. **A. A. Green**, "Advances in Genetic Circuitry for Synthetic Biology," Synthetic Biology Working Group Meeting VI, Technology Update: state of the science in rapidly developing areas of interest. Department of Homeland Security Science and Technology, Johns Hopkins University Applied Physics Laboratory, October 25, 2017. (Remote presentation)

6. *(International)* ***A. A. Green****, "Programming with RNA in Cells and on Paper," dnatec17: International Workshop on Future Trends in DNA-Based Nanotechnology, Dresden, Germany, May 30, 2017.*

5. *(International)* ***A. A. Green****, "A Primer on Toehold Switch Design," Connaught Summer Institute on Synthetic Biology, Toronto, Canada, June 7, 2016.*

4. *(International)* ***A. A. Green****, "Synthetic RNAs for Nucleic Acid Detection in Vivo and on Paper," Connaught Summer Institute on Synthetic Biology, Toronto, Canada, June 6, 2016.*

3. **A. A. Green**, "Synthetic RNAs for Nucleic Acid Detection in Vivo and on Paper," Foundations of Nanoscience Meeting (FNANO16), Snowbird, UT, April 12, 2016.

2. **A. A. Green**, "Computing Inside Cells and on Paper Using Synthetic RNA Networks," Molecular, Cellular, and Tissue Bioengineering Symposium, ASU, Tempe, AZ, April 2, 2016.

1. *(International)* ***A. A. Green****, "Synthetic RNA Networks for In Vivo Computation," RIBONETS RNA Design Workshop, Vienna, Austria, July 10, 2015.*

B. Invited Presentations at Academic Institutions as an ASU Faculty Member

3. *(International)* **A. A. Green**, "Cellular Computing and Paper-Based Diagnostics Powered by Engineered RNAs," Leslie Dan Faculty of Pharmacy, University of Toronto, Toronto, Canada, July 2, 2018.

2. **A. A. Green**, "RNA Synthetic Biology for Biocomputing and Diagnostics," 2018 Winter-Spring Dwain L Ford Lecture Series, Department of Chemistry & Biochemistry, Andrews University, February 15, 2018. (Remote presentation)

1. **A. A. Green**, "Harnessing RNA Nanotechnology for Biological Computing," ASU Nanoscale Science Seminar, Tempe, AZ, September 12, 2016.

C. Oral and Poster Presentationss by Green Group Graduate Students

3. A. Debnath, S. Saha, M. S. Gilliam, *D. O. Li*, Q. H. Wang & **A. A. Green**, "Eradiation of Multidrug-Resistant Bacteria by DNA-Encapsulated Two-Dimensional Transition Metal Dichalcogenides," ACS National Meeting, Boston, MA, August 20, 2018 (Oral Presentation and Poster).

2. A. Yousaf & **A. A. Green**, "Liquid-phase production and application of boron-rich two-dimensional materials," ACS National Meeting 2017, Washington, DC, August 22, 2017. (Poster)

1. A. Yousaf, Q. H. Wang & **A. A. Green**, "Solution-Phase Production and Application of Two-Dimensional Metal Diborides," MRS Spring 2017 Meeting, Symposium NM1: Emerging Non-Graphene 2D Materials, Phoenix, AZ, April 20, 2017. (Poster)

II. TEACHING EXPERIENCE

II.1. COURSES TAUGHT

Course	Year	Semester	Credit Hours	Enrollment
BCH 361: Principles of Biochemistry	2019	Fall	3	181
BCH 361: Principles of Biochemistry	2019	Spring	3	175
BCH 564 / BCH 494 / NAN 564: Bionanotechnology	2018	Fall	3	28
BCH 361: Principles of Biochemistry	2018	Spring	3	173
BCH 361: Principles of Biochemistry	2017	Spring	3	101
BCH 564 / BCH 494 / NAN 564: Bionanotechnology	2016	Fall	3	25
BCH 361: Principles of Biochemistry	2016	Spring	3	112
BCH 564 / BCH 494 / NAN 564: Bionanotechnology	2015	Fall	3	18

III. SERVICE

III.1. PROFESSIONAL SERVICE

Contributions to meeting organization:

- Co-chair Systems and Synthetic Biology Session of the 2017 Molecular, Cellular, and Tissue Bioengineering (MCTB) Symposium at ASU

Journal reviewer for:

- Nature Nanotechnology
- Nature Communications
- ACS Nano
- Advanced Materials
- Advanced Science
- Nucleic Acids Research
- ACS Synthetic Biology
- Advanced Engineering Materials
- The Journal of Physical Chemistry
- Nano Research
- Nucleic Acids Research
- Chemical Physics Letters
- Industrial & Engineering Chemistry Research
- Chemical Science
- Carbon
- Organic & Biomolecular Chemistry

Proposal reviewer for:

- National Science Foundation SBIR Program

III.2. DEPARTMENTAL SERVICE

- SMS Committee on Graduate Programs and Awards, 2015 – present
- SMS Library Liaison, 2017 – present
- Biodesign Laboratory Safety Committee, 2018 – present

III.3. UNIVERSITY SERVICE

- Team Leadership Academy (teamLA), 2015-2016 cohort
- Member of Advanced Materials Initiative Team

III.4. OUTREACH ACTIVITIES

- Runs demonstrations for ASU Night of the Open Door, 2016 – present
- Presentations to a lay audience:
    - **A. A. Green**, "A Primer on the Zika Virus," Spirit of the Senses salon, Tempe, AZ, July 11, 2016.