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EDUCATION

- 2011 Ph.D., Organic Chemistry: University of Illinois at Chicago
2005 B.S., with Highest Honors, Organic Chemistry: Moscow State University

RESEARCH EXPERIENCE

- 2016 – present **Assistant Professor, University of California, Davis**
- 2013 – 2016 **Camille and Henry Dreyfus Postdoctoral Fellow with Prof. Tobin J. Marks
Northwestern University**
- Developed direct C–H arylation polymerization toward high-efficiency photovoltaic polymers
 - Discovered efficient ternary solar cells based on chemically similar small molecule donors
 - Developed polymerization method for synthesis of polymers with controllable molecular weights for applications in high-performance all-polymer solar cells
 - Explored effects of heavy atom substitution on fill factor of small-molecule-based solar cells
 - Developed lanthanide-catalyzed regioselective dearomatization reaction of pyridines
- 2011 – 2012 **Postdoctoral Associate with Prof. Gregory C. Fu
Massachusetts Institute of Technology & California Institute of Technology**
- Developed nickel-catalyzed borylation reactions of primary, secondary, and tertiary alkyl halides
- 2005 – 2011 **Graduate Student with Prof. Vladimir Gevorgyan
University of Illinois at Chicago**
- Established stereo/regiodivergent gold- and copper-catalyzed methods toward functionalized dienes
 - Investigated mechanisms of the gold-catalyzed isomerizations of alkynyl-pyridines and haloallenes
 - Developed removable/modifiable directing group for regioselective C–H functionalizations of arenes
 - Devised new catalytic migratory cycloisomerizations toward functionalized furans and naphthalenes
- 2000 – 2005 **Undergraduate Student with Prof. L. G. Tomilova & Prof. M. M. Krayushkin
Moscow State University and Zelinsky Institute of Organic Synthesis**
- Explored chemical transformations of thiophene-containing 1,2,3-dithiazolium imines
 - Synthesized and studied properties of ruthenium complexes of phthalocyanines and their analogs

HONORS AND AWARDS

- 2013 – 2015 Camille and Henry Dreyfus Environmental Chemistry Postdoctoral Fellowship
2011 University of Illinois Graduate College Outstanding Thesis Award
2009 University of Illinois Graduate Dean's Scholar Fellowship
2007 – 2010 Student Travel Award, University of Illinois, Graduate School
2007 & 2008 Moriarty Graduate Fellowship
2005 Edward G. Rietz Fellowship
2001 & 2002 Soros International Science Foundation Scholarship in Chemistry Award
2000 Silver medal of International Mendeleev Olympiad in Chemistry
1999 1st class winner of Soros International Science Foundation Chemistry Olympiad

PUBLICATIONS (citations: >2300; h-index: 20)

- (28) Eastham, N. D.; **Dudnik, A. S.**; Harutyunyan, B.; Aldrich, T. J.; Leonardi, M. J.; Manley, E. F.; Butler, M. R.; Harschneck, T.; Ratner, M. A.; Chen, L. X.; Bedzyk, M. J.; Melkonyan, F. S.; Facchetti, A.; Chang, R. P. H.; Marks, T. J. “Enhanced Light Absorption in Fluorinated Ternary Small-Molecule Photovoltaics” *ACS Energy Lett.* **2017**, *2*, 1690-1697.
- (27) Eastham, N. D.; **Dudnik, A. S.**; Aldrich, T. A.; Manley, E. F.; Fauvell, T. J.; Hartnett, P. E.; Wasielewski, M. R.; Chen, L. X.; Melkonyan, F. S.; Facchetti, A.; Chang, R. P. H.; Marks, T. J. “Small Molecule Acceptor and Polymer Donor Crystallinity and Aggregation Effects on Microstructure Templating: Understanding Photovoltaic Response in Fullerene-Free Solar Cells” *Chem. Mater.* **2017**, *29*, 4432-4444.
- **Most Read Article in June 2017.**
- (26) **Dudnik, A. S.**;† Aldrich, T. A.;† Eastham, N. D.; Chang, R. P. H.; Facchetti, A.; Marks, T. J. “Tin-Free Direct C–H Arylation Polymerization for High Photovoltaic Efficiency Conjugated Copolymers” *J. Am. Chem. Soc.* **2016**, *138*, 15699-15709. († denotes equal contribution).
- (25) Zhou, N.; **Dudnik, A. S.**; Li, T. I. N. G.; Manley, E. F.; Aldrich, T. A.; Guo, P.; Liao, H.-C.; Chen, Z.; Chen, L. X.; Chang, R. P. H.; Facchetti, A.; Olvera de la Cruz, M.; Marks, T. J. “All-Polymer Solar Cell Performance Optimized via Systematic Molecular Weight Tuning of both Donor and Acceptor Polymers” *J. Am. Chem. Soc.* **2016**, *138*, 1240-1251.
- (24) Shiroodi, R. K.; Rivera Vera, C. I.; **Dudnik, A. S.**; Gevorgyan, V. “Synthesis of Furans and Pyrroles via Migratory Cycloisomerization Reactions of Homopropargylic Aldehydes and Imines” *Tetrahedron Lett.* **2015**, *56*, 3251-3254 (Invited article).
- (23) **Dudnik, A. S.**;† Weidner, V. L.;† Motta, A.; Delferro, M.; Marks, T. J. “Atom-Efficient Regioselective 1,2-De aromatization of Functionalized Pyridines by Earth-Abundant Organolanthanide Catalyst” *Nature Chem.* **2014**, *6*, 1100-1107 († denotes equal contribution).
- **Highlighted in Synfacts 2015, 357.**
- (22) Gulevich, A. V.; **Dudnik, A. S.**; Chernyak, N.; Gevorgyan, V. “Transition Metal-Catalyzed Synthesis of Monocyclic Aromatic Heterocycles” *Chem. Rev.* **2013**, *113*, 3084-3213.
- (21) Dubinina, T. V.; Dyumaeva, D. V.; Trashin, S. A.; Belosevich, A. V.; Sedova, M. V.; **Dudnik, A. S.**; Borisova, N. E.; Tomilova, L. G.; Zefirov, N. S. “Novel Planar and Sandwich-Type Complexes of Substituted Tetrathieno[2,3-*b*]porphyrazine: Synthesis and Investigation of Properties” *Dyes Pigm.* **2013**, *96*, 699-704.
- (20) **Dudnik, A. S.**; Fu, G. C. “Nickel-Catalyzed Coupling Reactions of Alkyl Electrophiles, Including Unactivated Tertiary Halides, To Generate Carbon–Boron Bonds” *J. Am. Chem. Soc.* **2012**, *134*, 10693-10697.
- **Featured in Organic Chemistry Portal: Miyaura Borylation Reaction.**
- (19) Shiroodi, R. K.; **Dudnik, A. S.**; Gevorgyan, V. “Stereocontrolled 1,3-Phosphatylxy and 1,3-Halogen Migration Relay toward Highly Functionalized 1,3-Dienes” *J. Am. Chem. Soc.* **2012**, *134*, 6928-6931.
- **Highlighted in Synfacts 2012, 762.**
- (18) Huang, C.; Chernyak, N.; **Dudnik, A. S.**; Gevorgyan, V. “The Pyridyldiisopropylsilyl Group: A Masked Functionality and Directing Group for Monoselective *ortho*-Acyloxylation and *ortho*-Halogenation Reactions of Arenes” *Adv. Synth. Catal.* **2011**, *353*, 1285-1305.
- (17) Xia, Y.; **Dudnik, A. S.**; Li, Y.; Gevorgyan, V. “On the Validity of Au-Vinylidenes in the Gold-Catalyzed 1,2-Migratory Cycloisomerization of Skipped Propargylpyridines” *Org. Lett.* **2010**, *12*, 5538-5541.

- (16) **Dudnik, A. S.**; Chernyak, N.; Gevorgyan, V. “Copper-, Silver-, and Gold-Catalyzed Migratory Cycloisomerizations Leading to Heterocyclic Five-Membered Rings” *Aldrichimica Acta* **2010**, *43*, 37-46. (Invited Review)
- (15) Yarovenko, V. N.; Sedishev, I. P.; **Dudnik, A. S.**; Zavarzin, I. V.; Krayushkin, M. M. “Synthesis and Reactivity of 2-(1,2,3-Dithiazol-5-ylidene)aminothiophenes” *Phosphorus, Sulfur Silicon Relat. Elem.* **2010**, *185*, 1558-1570.
- (14) **Dudnik, A. S.**; Chernyak, N.; Huang, C.; Gevorgyan, V. “A General Strategy toward Aromatic 1,2-Ambiphilic Synthons: Palladium-Catalyzed *ortho*-Halogenation of PyDipSi-Arenes” *Angew. Chem., Int. Ed.* **2010**, *49*, 8729-8732.
 • **Highlighted in *Org. Process Res. Dev.* 2011, 15, 306-313.**
- (13) Chernyak, N.; **Dudnik, A. S.**; Huang, C.; Gevorgyan, V. “PyDipSi: A General and Easily Modifiable/Traceless Si-Tethered Directing Group for C-H Acyloxylation of Arenes” *J. Am. Chem. Soc.* **2010**, *132*, 8270-8272.
- (12) **Dudnik, A. S.**; Xia, Y.; Li, Y.; Gevorgyan, V. “Computation-Guided Development of Au-Catalyzed Cycloisomerizations Proceeding via 1,2-Si- or 1,2-H Migrations: Regiodivergent Synthesis of Silylfurans” *J. Am. Chem. Soc.* **2010**, *132*, 7645-7655.
 • **Highlighted in *Organic Chemistry Highlights* (2010, October 18).**
- (11) **Dudnik, A. S.**; Gevorgyan, V. “Formal Inverse Sonogashira Reaction: Direct Alkynylation of Arenes and Heterocycles with Alkynyl Halides” *Angew. Chem., Int. Ed.* **2010**, *49*, 2096-2098.
- (10) **Dudnik, A. S.**; Gevorgyan, V. “Transition Metal-Catalyzed Synthesis of Monocyclic Five-Membered Aromatic Heterocycles”, in *Catalyzed Carbon-Heteroatom Bond Formation*; Yudin, A. K., Ed.; Wiley-VCH: Weinheim, **2010**, pp. 227-316.
- (9) **Dudnik, A. S.**; Gevorgyan, V. “Transition Metal-Catalyzed Synthesis of Fused Five-Membered Aromatic Heterocycles”, in *Catalyzed Carbon-Heteroatom Bond Formation*; Yudin, A. K., Ed.; Wiley-VCH: Weinheim, **2010**, pp. 317-410.
- (8) **Dudnik, A. S.**; Schwier, T.; Gevorgyan, V. “Gold(I)-Catalyzed Double Migration Cascades toward (1*E*,3*E*)-Dienes and Naphthalenes” *Tetrahedron* **2009**, *65*, 1859-1870. (Invited article)
- (7) **Dudnik, A. S.**; Schwier, T.; Gevorgyan, V. “Gold(I)-catalyzed Synthesis of (1*E*,3*E*)-Dienes from Propargylic Esters” *J. Organomet. Chem.* **2009**, *694*, 482-485. (Invited article)
- (6) Xia, Y.; **Dudnik, A. S.**; Gevorgyan, V.; Li, Y. “Mechanistic Insights into the Gold-Catalyzed Cycloisomerization of Bromoallenyl Ketones: Ligand-Controlled Regioselectivity” *J. Am. Chem. Soc.* **2008**, *130*, 6940-6941.
- (5) **Dudnik, A. S.**; Schwier, T.; Gevorgyan, V. “Gold-Catalyzed Double Migration/Benzannulation Cascade toward Naphthalenes” *Org. Lett.* **2008**, *10*, 1465-1468.
 • **Highlighted in *Synfacts* 2008, 630.**
- (4) **Dudnik, A. S.**; Sromek, A. W.; Rubina, M.; Kim, J. T.; Kel'in, A. V.; Gevorgyan, V. “Metal-Catalyzed 1,2-Shift of Diverse Migrating Groups in Allenyl Systems as a New Paradigm toward Densely Functionalized Heterocycles” *J. Am. Chem. Soc.* **2008**, *130*, 1440-1452.
 • **Highlighted in *Organic Chemistry Highlights* (2008, October 20).**
- (3) Chuprakov, S. N.; Chernyak, N.; **Dudnik, A. S.**; Gevorgyan, V. “Direct Pd-Catalyzed Arylation of 1,2,3-Triazoles” *Org. Lett.* **2007**, *9*, 2333-2336.
 • **Highlighted in *Org. Process Res. Dev.* 2007, 11, 784-796 and *Synfacts* 2007, 803.**
 • **2007 Top 20 Most Accessed Articles.**

- (2) **Dudnik, A. S.;** Gevorgyan, V. “Metal-Catalyzed [1,2]-Alkyl Shift in Allenyl Ketones: Synthesis of Multisubstituted Furans” *Angew. Chem., Int. Ed.* **2007**, *46*, 5195-5197.
 • **Highlighted in Synfacts 2007, 975.**
- (1) **Dudnik, A. S.;** Ivanov, A. V.; Tomilova, L. G.; Zefirov, N. S. “Synthesis and Study of Ruthenium Phthalocyanine Complexes” *Russ. J. Coord. Chem.* **2004**, *30*, 110-115.

SYNERGISTIC ACTIVITIES AND PROFESSIONAL MEMBERSHIPS

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| 2011 – present | Referee, Journal of the American Chemical Society |
| 2011 | Contributed two chapters (co-authored with Prof. Vladimir Gevorgyan) to the book “Catalyzed Carbon-Heteroatom Bond Formation” |
| 2009 – 2013 | Research mentor: graduate students (R. Shiroodi, UIC 2010–2011; T. Aldrich; N. Eastham, NU 2013–2016); summer student (A. Liu, Caltech 2012) |
| 2007 – 2011 | The Honor Society of Phi Kappa Phi, Member |
| 2007 – present | American Chemical Society, Member |

CONFERENCE PRESENTATIONS

- (18) Dudnik, A. S. “Novel Synthetic Approaches to Efficient Semiconducting Materials” 2017 Priestley Medalist: Symposium in honor of Tobin J. Marks. 253rd ACS National Meeting, San Francisco, CA, United States, April 2-6, **2017** (invited talk).
- (17) Dudnik, A. S.; Aldrich, T. J.; Facchetti, A.; Marks, T. J. “Direct C–H Arylation Polymerization toward Sustainable Synthesis of Conjugated Polymers for High Performance Organic Electronics” IFSOE-2016: 3rd International Fall School on Organic Electronics, Moscow region, Russia, September 18-23, **2016** (talk).
- (16) Dudnik, A. S.; Facchetti, A.; Marks, T. J. “Controlling Molecular Weight of Conjugated Polymers as a Powerful Tool for Optimizing the Efficiency of All-Polymer Solar Cells” PACIFICHEM 2015, Honolulu, HI, December 15-20, **2015** (talk).
- (15) Dudnik, A. S.; Weidner, V. L.; Motta, A.; Delferro, M.; Marks, T. J. “Atom-Efficient Regioselective 1,2-De aromatization of Functionalized Azines by Organolanthanide Catalysts: Scope and Mechanism” Gordon Research Conference: Organometallic Chemistry, Salve Regina University, Newport, RI, United States, July 12-17, **2015** (poster).
- (14) Dudnik, A. S.; Facchetti, A.; Marks, T. J. “Controlling Molecular Weight of Conjugated Polymers as a Powerful Tool for Optimizing the Efficiency of All-Polymer Solar Cells” Gordon Research Conference: Polymers, Mount Holyoke College, South Hadley, MA, United States, June 14-19, **2015** (poster).
- (13) Dudnik, A. S.; Fu, G. C. “Nickel-Catalyzed Coupling Reactions of Alkyl Electrophiles, Including Unactivated Tertiary Halides, To Generate Carbon–Boron Bonds” Gordon Research Conference: Organic Reactions and Processes, Bryant University, Smithfield, RI, United States, July 14-20, **2012** (poster).
- (12) Dudnik, A. S.; Gevorgyan, V. “Gold-Catalyzed Cycloisomerizations Proceeding via 1,2-Si or 1,2-H Migrations: Regiodivergent Synthesis of Silylfurans” 5th Negishi-Brown and Catalytic Asymmetric and Other Selective Syntheses (CAOSS) Lectures, Purdue University, West Lafayette, IN, United States, October 11-12, **2010** (poster, **Best Poster Award**).
- (11) Chernyak, N.; Dudnik, A. S.; Huang, C.; Gevorgyan, V. “PyDipSi: A General and Easily Modifiable/Traceless Si-Tethered Directing Group for C–H Acyloxylation of Arenes.” 27th Herbert C. Brown Lectures, Purdue University, West Lafayette, IN, April 24, **2010** (poster, **Best Poster Award**).

- (10) Dudnik, A. S.; Chernyak, N.; Huang, C.; Gevorgyan, V. "A General Strategy Toward Aromatic 1,2-Ambiphilic Synthons: Palladium-Catalyzed ortho-Halogenation of PyDipSi-Arenes." 5th Negishi-Brown and Catalytic Asymmetric and Other Selective Syntheses (CAOSS) Lectures, Purdue University, West Lafayette, IN, October 11-12, **2010** (poster).
- (9) Dudnik, A. S.; Gevorgyan, V. "Metal-Catalyzed 1,2-Migration as a Key Element in the Synthesis of Multisubstituted Furans" 4th Negishi-Brown and CAOSS Lectures, Purdue University, West Lafayette, IN, United States, October 12-13, **2009** (poster).
- (8) Dudnik, A. S.; Gevorgyan, V. "Metal-Catalyzed 1,2-Alkyl Migration as a Key Element in the Synthesis of Multisubstituted Furans" 1st International Conference on New Directions in the Chemistry of Heterocyclic Compounds, Kislovodsk, Russia, May 3-8, **2009** (talk).
- (7) Dudnik, A. S.; Schwier, T.; Gevorgyan, V. "Gold-Catalyzed Double Migration Cascades toward Naphthalenes and 1,3-Dienes" Gordon Research Conference: Organic Reactions and Processes, Bryant University, Smithfield, RI, United States, July 13-18, **2008** (poster).
- (6) Dudnik, A. S.; Schwier, T.; Gevorgyan, V. "Gold-Catalyzed Double Migration Cascades toward Naphthalenes and 1,3-Dienes" 39th Central Regional Meeting of the American Chemical Society (CERMACS), 111, Columbus, OH, United States, June 10-14, **2008** (talk).
- (5) Dudnik, A. S.; Gevorgyan, V. "Lewis Acid-Catalyzed [1,2]-Alkyl Shift in Allenyl Ketones: Synthesis of Multisubstituted Furans" 233rd ACS National Meeting, Chicago, IL, United States, March 25-29, **2007** (talk).
- (4) Dudnik, A. S.; Yarovenko, V. N.; Krayushkin, M. M. "New Approach to the Synthesis of 2-Cyanothieno[2,3-*b*]pyridines" The 1st Young Scientists Conference of Zelinsky Institute of Organic Synthesis, **2005**, Moscow, Russia (poster).
- (3) Ivanov, A. V.; Dudnik, A. S.; Tomilova, L. G. "Thiophene Compounds in Porphyrine Synthesis" International Conference on Phthalocyanines and Porphyrines, **2003**, Suzdal, Russia (poster).
- (2) Dudnik, A. S.; Tomilova, L. G. "Synthesis and Properties of Ruthenium Tetra-*tert*-butylphthalocyanine" The 2nd International Conference on Phthalocyanines and Porphyrines, ICPP-2, **2002**, P-29, Kyoto, Japan, 277 (poster).
- (1) Dudnik, A. S. "Synthesis, Structure and Spectral Behavior Investigations of 4-*tert*-Butyl-substituted Ruthenium Phthalocyanines" International Lomonosov Conference of Undergraduate and Graduate Students, **2001**, Moscow (talk).

REFERENCES

Prof. Vladimir Gevorgyan
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 Northwestern University
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 California Institute of Technology
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 Northwestern University
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 Center
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