

Alexander Kornienko

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Education

Postdoctoral Fellowship	Université de Montréal, Canada (Prof. Stephen Hanessian)	1999–2001
Ph.D. in Chemistry	Tufts University, Boston, USA (Prof. Marc d'Alarcao)	1994–1999
B.S in Chemical Engineering	Mendeleev University, Moscow, Russia	1989–1994

Appointments

Professor	Texas State University	2016-present
Associate Professor	Texas State University	2012-2016
Adjunct Professor	New Mexico Tech	2012-present
Chemistry Department Chair	New Mexico Tech	2010-2012
Chemistry Department Associate Chair	New Mexico Tech	2007-2009
Associate Professor	New Mexico Tech	2006–2012
Visiting Professor of Chemistry	Wits Univ., Johannesburg, South Africa	summer 2008
Assistant Professor of Chemistry	New Mexico Tech	2001–2006

Areas of Expertise

Synthetic Organic Chemistry (total synthesis and methodology)
Chemical Biology (focus on cancer signaling and death pathways)
Medicinal Chemistry (rational drug design and library screening)
Natural Product Chemistry (isolation, structure elucidation and analogue synthesis)

Honors and Professional Activities

Denise M. Trauth Endowed Presidential Research Professorship, 2021-present
Presidential Award for Excellence in Scholarly/Creative Activities, 2016
National Institutes of Health, Oncology 2 - Translational Clinical (OTC) Study Section Member, ad hoc, 2014.
National Science Foundation, Division of Chemistry, Chemical Synthesis Review Panel, 2011.
National Institutes of Health, Synthetic and Biological Chemistry B Study Section Member, ad hoc, 2010.
Proposal reviewer for: American Chemical Society – Petroleum Research Fund, Arizona Biomedical Research Commission, Alexander von Humboldt Foundation, European Fund for Research Training in Industry and Agriculture.
Associate Editor, Chemistry of Heterocyclic Compounds, 2014-current.
Editorial Board Member, Marine Drugs, 2019-current.
Editorial Advisory Board Member, Current Pharmaceutical Design, 2019-current.
Editor, Special Issue in Chemistry of Heterocyclic Compounds “Creative Design in the Synthesis of Heterocycles,” May 2014.

Journal Peer-Reviewer: Oncotarget, Journal of Organic Chemistry, Journal of Medicinal Chemistry, Organic Letters, Tetrahedron Letters, Bioorganic and Medicinal Chemistry Letters, ChemMedChem, Journal of Ethnopharmacology, Journal of Fluorine Chemistry, Journal of Natural Products, Synlett, Chemical Reviews, European Journal of Medicinal Chemistry, Pharmacological Research, Canadian Journal of Chemistry, Current Organic Chemistry, Journal of Visualized Experiments, Journal of Molecular Catalysis A, Chemistry of Heterocyclic Compounds, Chirality, Marine Drugs, Current Medicinal Chemistry, Current Pharmaceutical Design, Heterocyclic Communications, European Journal of Organic Chemistry, Molecules, ACS sustainable Chemistry and Engineering, ACS Omega, MedChemComm, RSC Advances, Phytochemistry, Journal of Agricultural and Food Chemistry, Tetrahedron, Accounts of Chemical Research, Journal of Cellular and Molecular Medicine, European Journal of Pharmacology, Scientific Reports, Bioorganic Chemistry, Cancer Letters, Dalton Transactions.

Patents

8. Sphaeropsidin derivatives to combat cancers. PCT/US2023/035648. Pending.
7. Photoactivatable cancer prodrug. US 16/757,370. Awarded.
6. Methods for treatment of resistant cancer. US 10,414,778 B2 2019. Awarded.
5. Novel Polygodial Analogues for the Treatment of Cancer and other Proliferative Diseases. US 62/208,656. Pending.
4. Antibiotic sensitivity-restoring and photosensitive agents. US 10,239,834 B2 2019. Awarded.
3. 2-Aryl-2-(3-indolyl)acetohydroxamates for the Treatment of Drug-Resistant Cancer. US 61/891,746 2013. Awarded.
2. Synthetic Rigidin Analogues as Anticancer Agents, Salts, Solvates and Prodrugs Thereof, and Method of Producing Same. US 08/946,246 2012. Awarded.
1. Pyrano[3,2-*c*]Pyridones and Related Heterocyclic Compounds as Pharmaceutical Agents for Treating Disorders Responsive to Apoptosis, Antiproliferation or Vascular Disruption, and the Use Thereof. US 12/407,358 2009. Awarded.

Book Chapters

1. In “Natural products targeting clinically relevant enzymes”: *Targeting enzymatic pathways with marine-derived clinical agents*. Ed. Andrade, P. B., 2017, Wiley-VCH Verlag GnmH & Co.
2. In “The alkaloids”: The rigidins: isolation, bioactivity, and total synthesis – novel pyrrolo[2,3-*d*]pyrimidine analogues using multicomponent reactions. Ed. Knolker, H. –J. Vol. 79, 2018, pp 191-202. Elsevier Inc. Academic Press.

Publications (H-index 48; 7,344 citations)

131. Red-light activation of a microtubule polymerization inhibitor via amide functionalization of the ruthenium photocage. Bretin, L.; Husiev, Y.; Ramu, V.; Zhang, L.; Hakkennes, M.; Abyar, S.; Johns, A. C.; Le Devedec, S. E.; Betancourt, T.; Kornienko, A.; Bonnet, S. *Angew. Chem. Int. Ed.* **2024**, *63*, e202316425.
130. Discovery of 5-sulfonyltetrazoles as neuroblastoma differentiation agents. Johns, A. C.; Oviedo, A.; Zhao, Z.; Du, L.; Kornienko, A. *Bioorg. Med. Chem. Lett.* **2023**, *94*, 129455.
129. Arutiunov, N. A.; Aksenov, A. V.; Aksenov, D. A.; Kurenkov, I. A.; Aksenova, I. V.; Zatsepilina, A. M.; Aksenov, N. A.; Kornienko, A. Convenient synthesis of (Z)-3-(1-aryl-2-nitrovinyl)-indoles. *Tetrahedron Lett.* **2023**, *129*, 154722.
128. Synthesis of b-carbolines with electrocyclic cyclization of 3-nitrovinylindoles. Aksenov, N. A.; Arutiunov, N. A.; Aksenov, A. V.; Kirilov, N. K.; Aksenova, I. V.; Aksenov, D. A.; Aleksandrova, E. V.; Kornienko, A. *Int. J. Mol. Sci.* **2023**, *24*, 13107.

127. Reductive cleavage of 4'H-Spiro[indole-3,5'-isoxazoles] En Route to 2-(1H-Indol-3-yl)acetamides with Anticancer Activities. Aksenov, A.; Kirilov, N.; Arutiunov, N.; Aksenov, D.; Kuzminov, I.; Aksenov, N.; Turner, D. N.; Rogelj, S.; Kornienko, A.; Rubin, M. *J. Org. Chem.* **2022**, *87*, 13955-13964.
126. Polygodial, a Sesquiterpene Dialdehyde, Activates Apoptotic Signaling in Castration-Resistant Prostate Cancer Cell Lines by Inducing Oxidative Stress. Venkatesan, R.; Hussein, M. A.; Moses, L.; Liu, J.; Khetani, S.; Kornienko, A.; Munirathinam, G. *Cancers* **2022**, *14*, 5260.
125. Medicinal chemical optimization of fluorescent pyrrole-based COX-2 probes. Wagh, S. B.; Maslivetc, V.; La Clair, J. J.; Kornienko, A. *Tetrahedron* **2022**, *123*, 132990.
124. Amaryllidaceae alkaloids decrease the proliferation, invasion, and secretion of clinically relevant cytokines by cultured human colon cancer cells. Mathieu, V.; Laguera, B.; Masi, M.; Dulanto, S. A.; Bingham, T. W.; Hernandez, L. W.; Sarlah, D.; Evidente, A.; Lafontaine, D. L. J.; Kornienko, A.; Lane, M. A. *Biomolecules* **2022**, *12*, 1267.
123. In Vitro Effects of fungal phytotoxins on cancer cell viability: first insight into structure activity relationship of a potent metabolite of *Cochliobolus australiensis* radicinin. Mathieu, V.; Superchi, S.; Masi, M.; Scafato, P.; Kornienko, A.; Evidente, A. *Toxins* **2022**, *14*, 517.
122. Conversion of natural narciclasine to its C-1 and C-6 derivatives and their antitumor activity evaluation: some unusual chemistry of narciclasine. Stollmaier, J. G.; Thomson, J.; Endoma-Arias, M. A.; Simionescu, R.; Vernaza, A.; Mesa-Diaz, N.; Smith, M.; Du, L.; Kornienko, A.; Hudlicky, T. *Molecules* **2022**, *27*, 4141.
121. Design and synthesis of C-1 methoxycarbonyl derivative of narciclasine and its biological activity. Habaz, L.; Bedard, K.; Smith, M.; Du, L.; Kornienko, A.; Hudlicky, T. *Molecules* **2022**, *27*, 3809.
120. Three-component assembly of stabilized fluorescent isoindoles. Maslivetc, V. A.; La Clair, J. J.; Kornienko, A. *RSC Adv.* **2022**, *12*, 6947.
119. Synthesis and biological evaluation of 10-benzyloxy-narciclasine. Ticli, V.; Zhao, Z.; Du, L.; Kornienko, A.; Hudlicky, T. *Tetrahedron* **2021**, *101*, 132505.
118. Polygodial and ophiobolin A analogues for covalent crosslinking of anticancer targets. Maslivetc, V.; Laguera, B.; Chandra, S.; Dasari, R.; Olivier, W. J.; Smith, J. A.; Bissember, A. C.; Masi, M.; Evidente, A.; Mathieu, V.; Kornienko, A. *Int. J. Mol. Sci.* **2021**, *22*, 11256.
117. [3+2]-Annulation of pyridinium ylides with 1-chloro-2-nitrostyrenes unveils a tubulin polymerization inhibitor. Aksenov, A. V.; Arutiunov, N. A.; Kirilov, N. K.; Aksenov, D. A.; Grishin, I. Yu.; Aksenov, N. A.; Wang, H.; Du, L.; Betancourt, T.; Pelly, S. C.; Kornienko, A.; Rubin, M. *Org. Biomol. Chem.* **2021**, *19*, 7234-7245.
116. Lessons in organic fluorescent probe discovery. Wagh, S. B.; Maslivetc, V. A.; La Clair, J. J.; Kornienko, A. *ChemBioChem*, **2021**, *22*, 3109-3139.
115. Epithelial-mesenchymal transition sensitizes breast cancer cells to cell death via the fungus-derived sesterterpenoid ophiobolin A. Reisenauer, K. N.; Tao, Y. F.; Das, P.; Song, S. X.; Svatek, H.; Patel, S. D.; Mikhail, S.; Ingros, A.; Sheesley, P.; Masi, M.; Boari, A.; Evidente, A.; Kornienko, A.; Romo, D.; Taube, J. *Sci. Rep.* **2021**, *11*, 10652.
114. Activity of natural and synthetic polygodial derivatives against *Trypanosoma cruzi* amastigotes, trypomastigotes and epimastigotes. Turner, D. N.; Just, J.; Dasari, R.; Smith, J. A.; Bissember, A. C.; Kornienko, A.; Rogelj, S. *Nat. Prod. Res.* **2021**, *35*, 792-795.
113. A fluorescent target-guided Paal-Knorr reaction. Wagh, S. B.; Maslivetc, V.; La Clair, J. J.; Kornienko, A. *RSC Adv.* **2020**, *10*, 37035-37039.
112. Nitroalkanes as electrophiles: synthesis of triazole-fused heterocycles with neuroblastoma differentiation activity. Aksenov, N. A.; Aksenov, A. V.; Kirilov, N. K.; Arutiunov, N. A.; Aksenov, D. A.; Maslivetc, V.; Zhao, Z.; Du, L.; Rubin, M.; Kornienko, A. *Org. Biomol. Chem.* **2020**, *18*, 6651-6664.

111. Deciphering the chemical instability of sphaeropsidin A under physiological conditions – degradation studies and structural elucidation of the major metabolite. Van der Westhuyzen, A. E.; Ingels, A.; Rosiere, R.; Amighi, K.; Oberer, K.; Gustafson, K. R.; Wang, D.; Evidente, A.; Maddau, L.; Masi, M.; de Villiers, A.; Green, I. R.; Berger, W.; Kornienko, A.; Mathieu, V.; van Otterlo, W. A. L. *Org. Biomol. Chem.* **2020**, *18*, 8147-8160.
110. A new series of acetohydroxamates shows in vitro and in vivo anticancer activity against melanoma. Segat, G. C.; Moreira, C. G.; Santos, E. C.; Heller, M.; Schwanke, R. C.; Aksenov, A. V.; Aksenov, N. A.; Aksenov, D. A.; Kornienko, A.; Marcon, R.; Calixto, J. B. *Invest. New Drugs* **2020**, *38*, 977-989.
109. Antiproliferative activity of naphthoquinones and indane carboxylic acids from lapachol against a panel of human cancer cell lines. Eyong, K. O.; Ketsemen, H. L.; Zhao, Z.; Du, L.; Ingels, A.; Mathieu, V.; Kornienko, A.; Hull, K. G.; Folefoc, G. N.; Baskaran, S.; Romo, D. *Med. Chem. Res.* **2020**, *29*, 1058-1066.
108. Synergistic action of substituted indole derivatives and clinically used antibiotics against drug-resistant bacteria. Turner, D. N.; Edwards, L.; Kornienko, A.; Frolova, L. V.; Rogelj, S. *Future Med.* **2020**, *15*, 579-590.
107. Photo-uncaging of a microtubule-targeted rigidin analogue in hypoxic cancer cells and in a xenograft mouse model. van Rixel, V. H. S.; Ramu, V.; Auyeung, A. B.; Beztsinna, N.; Leger, D. Y.; Lameijer, L. N.; Hilt, S. T.; Le Devedec, S. E.; Yilidiz, T.; Betancourt, T.; Gildner, M. B.; Hudnall, T. W.; Sol, V.; Liagre, B.; Kornienko, A.; Bonnet, S. *J. Am. Chem. Soc.* **2019**, *141*, 18444-18454.
106. A brief up-to-date overview of Amaryllidaceae alkaloids: phytochemical studies of *Narcissus tazetta* subsp. *tazetta* L., collected in Turkey. Karakoyun, C.; Masi, M.; Cimmino, A.; Ali Onur, M.; Somer, N. U.; Kornienko, A.; Evidente, A. *Nat. Prod. Commun.* **2019**, 1-6.
105. Marine-Derived Anticancer Agents: Clinical Benefits, Innovative Mechanisms, and New Targets. Pereira, R. B.; Evdokimov, N. M.; Lefranc, F.; Valentao, P.; Kornienko, A.; Pereira, D.; Andrade, P. B.; Gomes, N. G. M. *Mar. Drugs* **2019**, *17*, 329.
104. Chemistry and biology of ophiobolin A and its congeners. Masi, M.; Dasari, R.; Evidente, A.; Mathieu, V.; Kornienko, A. *Bioorg. Med. Chem. Lett.* **2019**, *29*, 859-869.
103. Microtubule-targeting 7-deazahypoxanthines derived from marine alkaloid rigidins: exploration of the N3- and N9 positions and interaction with multidrug resistance proteins. Dasari, R.; Blauz, A.; Medelin, D.; Kassim, R.; Viera, C.; Santarosa, M.; Van der Westhuyzen, A.; van Otterlo, W. A. L.; Olivas, T.; Yildiz, T.; Betancourt, T.; Shuster, C. B.; Rogelj, S.; Rychlik, B.; Hudnall, T. Frolova, L.; Kornienko, A. *ChemMedChem*, **2019**, *14*, 322-333.
102. Synthesis of spiro[indole-3,5'-isoxazoles] with anticancer activity via formal (4+1)-spirocyclization of nitroalkenes to indoles. Aksenov, A. V.; Aksenov, D. A.; Arutiunov, N. A.; Aksenov, N. A.; Aleksandrova, E. V.; Zhao, Z.; Du, L.; Kornienko, A.; Rubin, M. *J. Org. Chem.* **2019**, *84*, 7123-7137.
101. Algae metabolites: from in vitro growth inhibitory effects to promising anticancer activity. Lefranc, F.; Koutsaviti, A.; Ioannou, E.; Kornienko, A.; Roussis, V.; Kiss, R.; Newman, D. J. *Nat. Prod. Rep.* **2019**, *36*, 810-841.
100. Alkaloids isolated from *Haemanthus humilis* Jacq., an indigenous South African Amaryllidaceae: Anticancer activity of coccinine and montanine. Mochel, J.; Heliso, P.; Gunawardana, S.; Masi, M.; James, P.; Albalawi, A.; Van slambrouck, S.; van Otterlo, W. A. L.; Green, I.; Cimmino, A.; van Rensburg, M. J.; Kornienko, A.; Evidente, A. *S. Afr. J. Bot.* **2019**, 277-281.
99. A nitroalkane-based approach to one-pot three-component synthesis of isocryptolepine and its analogs with potent anti-cancer activities. Aksenov, N. A.; Aksenov, A. V.; Kornienko, A.; De Carvalho, A.; Mathieu, V.; Aksenov, D. A.; Ovcharov, S. N.; Griaznov, G. D.; Rubin, M. *RSC Adv.* **2018**, *8*, 36980.
98. Novel polygodial analogs P3 and P27: Efficacious therapeutic agents disrupting mitochondrial function in oral squamous cell carcinoma. De La Chapa, J.; Singha, P. K.; Sallaway M.; Self, K.; Nasreldin, R.; Dasari, R.; Hart, M.; Kornienko, A.; Just, J.; Smith, J. A.; Bissimber, A. C.; Gonzales, C. B. *Int. J. Oncol.* **2018**, *53*, 2627-2636.

97. Photoactivated 2,3-distyrylindoles kill multi-drug resistant bacteria. Edwards, L.; Turner, D.; Champion, C.; Khandelwal, M.; Zingler, K.; Stone, C.; Rajapaksha, R. D.; Yang, J.; Ranasinghe, M. I.; Kornienko, A.; Frolova, L.; Rogelj, S. *Bioorg. Med. Chem. Lett.* **2018**, *28*, 1879-1886.
96. Effect of polygodial and its direct derivatives on the mammalian Na⁺/K⁺-ATPase activity. Garcia, D. G.; Goncalves-de-Albuquerque, C. F.; da Silva C. I.; Kiss, R.; Dasari, R.; Chandra, S.; Kornienko, A.; Burth, P. *Eur. J. Pharmacol.* **2018**, *831*, 1-8.
95. Polygodial analog induces apoptosis in LNCaP prostate cancer cells. Dasari, S.; Samy, A. L. P. A.; Narvekar, P.; Dontaraju, V. S.; Dasari, R.; Kornienko, A.; Munirathinam, G. *Eur. J. Pharmacol.* **2018**, *828*, 154-162.
94. Novel topologically complex scaffold derived from alkaloid haemanthamine. Govindaraju, K.; Masi, M.; Colin, M.; Mathieu, V.; Evidente, A.; Hudnall, T. W.; Kornienko, A. *Molecules*, **2018**, *23*, 255.
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92. The Amaryllidaceae alkaloid haemanthamine binds the eukaryotic ribosome to repress cancer cell growth. Pellegrino, S.; Meyer, M.; Zorbas, C.; Bouchta, S. A.; Saraf, K.; Pelly, S. C.; Yusupova, G.; Evidente, A.; Mathieu, V.; Kornienko, A.; Lafontaine, D. L. J.; Yusupov, M. *Structure*, **2018**, *26*, 416-425.
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89. Irreversible protein labeling by Paal-Knorr conjugation. Dasari, R.; La Clair, J. J.; Kornienko, A. *ChemBioChem*. **2017**, *18*, 1792-1796.
88. One-pot, three-component assembly of indoloquinolines: Total synthesis of isocryptolepine. Aksenov, A.; Aksenov, D.; Orazova, N.; Aksenov, N.; Griaznov, G.; de Carvalho, A.; Kiss, R.; Mathieu, V.; Kornienko, A.; Rubin, M. *J. Org. Chem.* **2017**, *82*, 3011-3018.
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Research Support

GM134910

01/01/20 – 12/31/2024

NIH/NIGMS

Pharmacophore-Directed Retrosynthesis Applied to Bioactive Natural Products Informing Mechanism of Action Studies

Role: co-PI

CA227680

02/01/19 – 01/31/2023

NIH/NCI

Acid-Sensitive Glioblastoma Prodrugs Derived from Ophiobolin A

Role: PI

GM131717

09/01/19 – 08/31/2021

NIH/NIGMS

Tandem Discovery of Drug Leads and Targets via Paal-Knorr Reaction

Role: PI

CA213199

08/01/17 – 07/31/20

NIH/NCI

Discovery of New Differentiation Agents for Neuroblastoma Therapy

Role: co-PI

CA186046

07/15/14 – 06/30/17

NIH/NCI

Mode of Action of the Amaryllidaceae Alkaloid Lycorine – Promising Anticancer Agent

Role: PI

RR016480

05/01/09 – 02/28/14

NIH/NIGMS

Chemical Biology and Screening Collaborative Core

Role: co-PI

CA135579

03/01/09 – 02/29/12

NIH/NCI

Heterocyclic Analogues of Podophyllotoxin Accessible by a One-Step Multicomponent Synthesis

Role: PI

RR016480

01/07/04 – 06/30/09

NIH/NCRR

Elucidation of the Pancreatistatin Cytotoxic Pharmacophore

Role: PI

MH074425

11/30/05 – 05/31/09

NIH/NIMH and NHGRI

New Mexico Molecular Libraries Screening Center

Role: co-PI

CA099957-02

06/01/05 – 05/31/08

NIH/NCI

Practical Enantiodivergent Synthesis of (+) and (-)-Pancreatistatin from D-Xylose

Role: PI

CA099957-01

06/01/03 – 05/31/05

NIH/NCI

Practical Enantiodivergent Synthesis of (+) and (-)-Pancreatistatin from D-Xylose

Role: PI

Sandia National Laboratories

10/01/03 – 09/30/04

Sandia-University Research Program

Direct Route to Propylene Oxide: Confronting an Industrial “Holy Grail” with a Versatile Platinum Catalyst

Role: PI

Teaching

1. *General Chemistry I and II* (freshman)
2. *Organic Chemistry I and II* (sophomore)
3. *Intermediate Organic Chemistry* (junior)
4. *Organic Chemistry Laboratory I and II* (sophomore)
5. *Green Organic Chemistry Laboratory* (sophomore)
6. *Polymer Chemistry* (senior)
7. *Biochemistry I and II* (senior)
8. *Advanced Organic Synthesis* (graduate)
9. *Medicinal Chemistry* (graduate)
10. *Physical Organic Chemistry* (graduate)
11. *Advanced Organic Chemistry* (graduate)
11. *The Logic of Chemical Synthesis (short course)*
12. *Medicinal Chemistry (short course)*

Student Training

Number of PhD dissertations: 3

Number of MSc theses: 10

Number of postdoctoral fellows: 12

Number of undergraduate students supervised: 86

Student Posters and Oral Presentations at local conferences: 86

Student Papers at National American Chemical Society meetings: 17

Undergraduate Students have gone on to pursue PhD degrees at Stanford, Columbia, Emory, Illinois Urbana-Champaign, among others.

Three graduates are now Professors of Organic Chemistry.

Article with an undergraduate student first author Medellin, D. C. et al. *J. Med. Chem.* **2016**, 59, 480-485 is featured on the journal cover *J. Med. Chem.* **2017**, issue 7 (April 13).