

# Ivan V Grishagin PhD

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## EXPERIENCE

**2015-present**

*Bioinformatician*

### **National Center for Advancing Translational Sciences**

**Rockville, MD**

- On-site liaison and bioinformatician.
- Designed and developed an R-based comprehensive pipeline for integration of key public and manually curated pathway sources, and elaborate visualization of 1,658 pathway maps for NCATS BioPlanet.
- Oversaw the development of the NCATS BioPlanet, a public resource for interactive browsing and analysis of human pathways and pathway connections. Responsible for collecting and cleaning pathway data, providing pathway visualizations, UI/UX design, and debugging.
- Managed, oversaw, and participated in the development of Inxight Drugs, a comprehensive portal for drug development information. Prepared the data, designed and implemented UI elements, layout of the pages, and worked out user experience aspects.
- Performed a complete comprehensive annotation of 350 rare and novel epigenetic modifiers with over 8,000 fields. Developed workflow and R code for automated annotation, performed annotation and QC.
- Comprehensive annotation of 50K chemical compounds: responsible for workflow, UI/UX, and database design and specifications, management of the web UI development, annotation oversight, QC, and QnA.
- Annotation of drugs with orphan designations issued by FDA, EMA, and NIBIOHN: responsible for the data aggregation and preparation, workflow design, and project coordination.
- Public NCATS web resources: responsible for project management, team coordination, and support for the development of UI/UX specifications and data selection/representation.
- Responsible for coordination and management of external collaborations.

**2015-present**

*Bioinformatician*

### **Rancho BioSciences**

**Rockville, MD**

- On-site liaison and bioinformatician at NIH NCATS.
- R development: code refactoring, debugging, and optimization; building R packages.
- Implemented complex statistical methods and visualization tools into a Protein Array Analyzer R package.
- VBA development: MS Excel add-ins for data curation; MS Word and MS PowerPoint macros.
- Data cleanup, harmonization, and alignment with standardized ontological vocabularies.
- Microarray, protein array, sequencing, biosensor, viability assay data analysis and visualization.
- Project management: project architecture and specifications; server organization guidelines; problem solving; liaison for the development, curation and management teams.
- Interaction with clients, presales, proposal preparation.

**2014-2015**

*Research Fellow*

### **Queen's University Belfast, CCRCB**

**Belfast, Northern Ireland**

- Main project: repurposing FDA-approved drugs for blood cancer therapies.
- Developed a complete pipeline solution for automatic data processing of Illumina BeadArray output with R: from raw data to publication-quality figures.

- Analyzed response of leukemia to salinomycin at the transcription level using Illumina BeadArray. Processed the data, discovered and confirmed 18 significantly affected genes.
- Used connectivity mapping with Library of Integrated Cellular Signatures (LINCS) to identify approved drugs efficacious against known drivers of leukemia.
- Designed and carried out a comprehensive screen of an FDA-approved drug library (760 compounds, 3 concentrations, 2 cell lines, 2 time points, and 2 replicates each) in two primary mouse cell lines. Analyzed the data and confirmed the hits in murine and human patient cells.
- Analyzed numerous microarray, protein array, sequencing, and viability assay data sets.

**2010-2014**

*Research Assistant*

**University of Southern California, School of Pharmacy**

**Los Angeles, CA**

- Determined high in vitro and in vivo anticancer efficacy of topographical mimetics of HIF1 $\alpha$  in disrupting hypoxia-dependent pathways.
- Investigated uptake, toxicity, and in vivo anticancer efficacy of rhomboidal Pt(II) metallacycles.
- Designed and completed a screen of 105 compounds to discover inhibitors of hypoxia-inducible signaling in breast cancer. Analyzed the data and confirmed the hits.
- Designed, developed, and published a complete, inexpensive, and robust method to count live mammalian cells automatically 10-15 times faster than the conventional approach.
- Investigated synergy of simultaneous inhibition of MAOA and hypoxia-inducible transcription in prostate cancer.
- Supervised and taught undergraduate and junior graduate students.

**2008-2010**

*Research and Teaching Assistant*

**University of Arizona, Department of Chemistry**

**Tucson, AZ**

- Optimized the synthesis of an epidithiodiketopiperazine precursor on a gram scale for a facile preparation of BC001, a designed molecule with in vivo anticancer properties, in clinically relevant quantities. BC001 was licensed to Globavir, and in 2015 [exclusively licensed](#) to Sorrento Therapeutics for \$80 million in regulatory and sales milestones, in addition to multi-tiered royalty payments.
- Conducted organic chemistry labs and related lectures for undergraduate students.
- Proctored and graded the examinations in undergraduate organic chemistry classes.

## SKILLS

- **Programming and Data Analysis:** R, VBA, [Git](#), [Python](#), [ImageJ Macro Language](#), [JavaScript](#), [HTML5/CSS3](#), [jQuery](#), [Markdown](#), bash, Cypher, SQL, [data mining and organization](#), Angular, Java, Scala.
- **Key software:** R Studio, Git, MS Office 2016, ImageJ, GraphPad Prism 5, Photoshop CS6, ChemBioDraw 13, Emacs, IntelliJ IDEA, Eclipse, Balsamiq Mockups 3.
- **Cell biology:** mammalian cell culture, cell viability assays, gene expression analysis (microarray, [Illumina BeadArray data processing](#), qRT-PCR), PCR, western blot, [protein array analysis](#) (ProtoArray), confocal and fluorescent microscopy, flow cytometry and cell sorting, luciferase reporter assay, colony formation assay, molecular cloning, protein expression and purification, low-throughput screening (20K assay points) in cell-based assays.
- **In vivo testing:** xenograft implantation into mice, IP and IV injections, euthanasia, organ harvesting, tissue handling, in vivo imaging, histology.
- **Chemistry:** organic synthesis, NMR, HPLC, LC-MS, IR, UV-Vis, dynamic/static light scattering.
- **Languages:** English (Fluent), Russian (Native), German (Intermediate), French (Intermediate).

## EDUCATION

### Johns Hopkins Bloomberg School of Public Health

Coursera

R Programming [Verified Certificate](#) (with Distinction), 2014.

Getting and Cleaning Data [Verified Certificate](#) (with Distinction), 2014.

### University of Southern California, School of Pharmacy

Los Angeles, CA

PhD in Pharmaceutical Sciences (**GPA 3.91**), 2014.

Dissertation: "Small Molecule Modulators of HIF1 $\alpha$  Signaling."

### University of Arizona, Department of Chemistry

Tucson, AZ

Attained PhD candidacy (**GPA 4.0**), 2010.

Transferred to University of Southern California.

### Lomonosov Moscow State University, Department of Chemistry

Moscow, Russia

Diploma in Polymer Chemistry (**Summa cum Laude**, Gold Medal), 2008.

Thesis: "Formation of Interpolyelectrolyte Complexes in Organic Media of Low Polarity".

## PUBLICATIONS

- Roulston, G.; Burt, C.; Kettyle, L.; Matchett, K.; Keenan, H.; Mulgrew, N.; Ramsey, J.; Dougan, C.; McKiernan, J.; **Grishagin, I.**; Mills, K.; & Thompson, A. Low-Dose Salinomycin Induces Anti-leukemic Responses in AML and MLL. *Oncotarget* **2016**, 7(45), 73448-73461, DOI: [10.18632/oncotarget.11866](https://doi.org/10.18632/oncotarget.11866)
- Matchett, K.B.; **Grishagin, I.**; Kettyle, L.M.; Gavory, G.; Harrison, T.; Mills, K.I.; & Thompson, A. Mebendazole: A Candidate FDA Approved Drug for Repurposing in Leukaemia. *Br. J. Haematol.* **2016**, 173(Supplement S1):5-178, 9, DOI: [10.1111/bjh.14019](https://doi.org/10.1111/bjh.14019)
- Arora, P.S.; Olenyuk, B.Z.; Bullock, B.; **Grishagin, I.** Control of Hypoxia-Inducible Gene Expression with Oligoioxopiperazine Nonpeptidic Helix Mimetics. *US Patent 9255086 B2*, Feb 09, **2016**
- Kettyle, L.M.; Lebert-Ghali, C.; **Grishagin, I.**; Dickson, G.J.; Bijl, J.J.; McMullin, M.F.; Lappin, T.R.; Mills, K.I.; & Thompson, A. Conditional Deletion of the HOXA Cluster in MLL-AF9 is Incompatible with Leukemia Maintenance, *Hematologica* **2016**, 101(S1), 38
- Kettyle, L.M.; **Grishagin, I.**; Dickson, G.J.; Lebert-Ghali, C.; Bijl, J.J.; Mills, K.I.; & Thompson, A. Conditional Deletion of the Hoxa Cluster in MLL-AF9 is Incompatible with Leukemia Maintenance. *Br. J. Haematol.* **2016**, 173(Supplement S1):5-178, 121, DOI: [10.1111/bjh.14019](https://doi.org/10.1111/bjh.14019)
- Kettyle, L.M.; **Grishagin, I.**; Dickson, G.J.; Lebert-Ghali, C.; Bijl, J.J.; Mills, K.I.; & Thompson, A. Conditional Deletion of the Hoxa Cluster in MLL-AF9 is Incompatible with Leukemia Maintenance. *Blood* **2015**, 126(23), 3630
- **Grishagin, I.** Automatic Cell Counting with ImageJ. *Anal. Biochem.* **2014**, 473, 63-65, DOI: [10.1016/j.ab.2014.12.007](https://doi.org/10.1016/j.ab.2014.12.007)
- **Grishagin, I.**; Pollock, J.B.; Kushal, S.; Cook, T.R.; Stang, P.J.; Olenyuk, B.Z. In Vivo Anticancer Activity of Rhomboidal Pt(II) Metallacycles. *PNAS* **2014**, 111, 52, 18448–18453, DOI: [10.1073/pnas.1418712111](https://doi.org/10.1073/pnas.1418712111)
- Lao, B.B.\*; **Grishagin, I.\***; Mesallati, H.; Brewer, T.; Olenyuk, B.Z.; Arora, P.S. In Vivo Modulation of Hypoxia-Inducible Signaling by Topographical Helix Mimetics. *PNAS* **2014**, 111, 21, 7531-7536, DOI: [10.1073/pnas.1402393111](https://doi.org/10.1073/pnas.1402393111)

\*authors contributed equally

- Dubey, R.; **Grishagin, I.**; Nagavarapu, U.; Balan, C.; Gupta, S.; Olenyuk, B.Z. Novel Selective HIF1 Alpha Inhibitor: Well Tolerated with Excellent Efficacy in Renal Cell Cancer Xenograft Studies. *Cancer Res.* **2015**, 74(19 Supplement), 1014, DOI:10.1158/1538-7445.AM2014-1014
- Arora, P.S.; Olenyuk, B.Z.; Bullock, B.; **Grishagin, I.** Control of Hypoxia-Inducible Gene Expression with Oligooxopiperazine Nonpeptidic Helix Mimetics. *International Patent WO 2013123511 A1*, Aug 22, **2013**
- **Grishagin, I.**; Olenyuk, B.Z.; Bullock, B.; Arora, P.S. OOPs: Novel HIF-1 $\alpha$  Mimics. *Cancer Res.* **2012**, 72(8 Supplement), 283, DOI:1538-7445.AM2012-283
- Burkhardt, M.; Martinez-Castro, N.; Tea, S.; Drechsler, M.; Babin, I.; **Grishagin I.**; Schweins, R.; Pergushov, D.V.; Gradzielski, M.; Zezin, A.B.; Müller, A.H.E. Polyisobutylene-block-Poly(methacrylic acid) Diblock Copolymers: Self-Assembly in Aqueous Media. *Langmuir* **2007**, 23 (26), 12864-12874, DOI: 10.1021/la701807b

## POSTERS

- Poster, AACR meeting, Chicago, IL, US, April 1-4, **2012**, #283
- Poster, 6th International Symposium "Molecular Mobility and Order in Polymer Systems", St. Petersburg, Russia, June 2-6, **2008**
- Poster, Bayreuth Polymer Symposium, Bayreuth, Germany, September 9-11, **2007**, PI21
- Poster, 41st IUPAC World Polymer Congress, Moscow, Russia, June 27-July 1, **2005**, p.231, P9.4-23
- Poster, 5th International Symposium "Molecular Mobility and Order in Polymer Systems", St. Petersburg, Russia, June 20-24, **2005**, P-186

## HONORS AND AWARDS

- Member of Phi Kappa Phi Collegiate Honor Society, US, **2014**
- Member of Rho Chi Academic Honor Society in Pharmacy, Theta Chapter, US, **2014**
- Winner of USC Norris Comprehensive Cancer Center Charles Heidelberger Predoctoral Scholarship Award in Cancer Research, Los Angeles, CA, US, **2013**
- Recipient of the Presidential Scholarship, Moscow, Russia, **2008**
- Winner of "Potanin Scholarship-2007" for the "Balance of Individualism and Leadership Qualities", Moscow, Russia, **2007**