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# JAMES C. COSTELLO, PH.D.

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## Research Interests

Systems biology, Bioinformatics, urological cancers, mathematical models, cancer genomics, data integration, algorithms, gene regulatory network inference, machine learning and translating systems-level models into testable hypotheses.

## EDUCATION

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<b>PhD</b>	<b>Informatics</b> , Indiana University, Bloomington School of Informatics	August 2009
<b>MS</b>	<b>Bioinformatics</b> , Indiana University, Bloomington School of Informatics	August 2004
<b>BS</b>	<b>Biology</b> , University of Iowa	May 2002
<b>BS</b>	<b>Economics</b> , University of Iowa	May 2002

## RESEARCH AND PROFESSIONAL EXPERIENCE

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<b>Assistant Professor</b> Department of Pharmacology University of Colorado Anschutz Medical Campus, Aurora, CO	2014 to present
<b>Director of the Bioinformatics Core</b> University of Colorado Cancer Center, BBSR University of Colorado Anschutz Medical Campus, Aurora, CO	2019 to present
<b>Faculty Member</b> Pharmacology Computational Biosciences Biomedical Science Program Cancer Biology Medical Science Training Program University of Colorado Cancer Center University of Colorado Anschutz Medical Campus, Aurora, CO	2014 to present
<b>Director of Computational/Systems Biology DREAM Challenges</b> Sage Bionetworks, Seattle, WA	2013 to present
<b>Associate Director of the Bioinformatics Core</b> University of Colorado Cancer Center, BBSR University of Colorado Anschutz Medical Campus, Aurora, CO	2018 to 2019
<b>Consultant, Enbiotix</b> Cambridge, MA	2012 to 2013
<b>Consultant, Selventa</b> Cambridge, MA	2012 to 2013
<b>Instructor</b> Brigham and Women's Hospital Harvard Medical School, Boston MA Research Program of Men's Health: Aging and Metabolism	2013 to 2013
<b>Postdoctoral Research Associate</b> HHMI/Boston University, Boston, MA Advisor: James J. Collins, Ph.D.	2009 to 2013

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<b>Consultant, Vertex Pharmaceuticals</b> Cambridge, MA	2011
<b>Research Associate/Graduate Student</b> Indiana University, Bloomington, IN Advisors: Mehmet M Dalkilic, Ph.D. & Justen R Andrews, Ph.D.	2006 to 2009
<b>Assistant Staff Scientist</b> Center for Genomics and Bioinformatics, Bloomington, IN	2004 to 2006
<b>Associate Instructor/Graduate Student</b> Indiana University, Bloomington, IN Advisor: Mehmet M Dalkilic, Ph.D.	2003 to 2004

## **PUBLICATIONS (H-INDEX = 25; I-10-INDEX = 38)**

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### **Google Scholar:**

<https://scholar.google.com/citations?user=zLSCHnkAAAAJ&hl=en>

### **Colorado Profiles:**

<https://profiles.ucdenver.edu/display/3663664>

### **Complete List of published works in MyBibliography**

<http://www.ncbi.nlm.nih.gov/myncbi/browse/collection/47290117/?sort=date&direction=descending>

Note that underlined names are members of the Costello lab

### *bioRxiv*

1. Rani K Powers, Anthony Sun, **James C Costello**. GSEA-InContext Explorer: An interactive visualization tool for putting gene set enrichment analysis results into biological context. *bioRxiv* 10.1101/659847 (June 4, 2019).
2. Brian C Ross, Fabio Anaclerio, Nicola Lorusso, Mario Ventura, **James C Costello**. Measuring chromosome conformation by fluorescence microscopy. *bioRxiv* 10.1101/798512 (October 16, 2019).

*Refereed (Invited articles are noted)*

### **2019**

1. Rani K Powers, Rachel Culp-Hill, Michael Ludwig, Keith Smith, Kate Waugh, Ross Minter, Katie Tuttle, Angela Rachubinski, Ross Granrath, Rebecca Burgoyne, Angelo D'Alessandro, **James C Costello**, Kelly D Sullivan\*, Joaquin M Espinosa\*. Trisomy 21 disrupts tryptophan catabolism toward production of neurotoxic metabolites via the interferon-inducible kynurenine pathway. *Nature Communications* 10:4766.
2. Satoshi Washino, Leah C Rider, Lina Romero, Lauren Jillson, **James C Costello\***, Scott D Cramer\*. Loss of MAP3K7 sensitizes prostate cells to Dinaciclib and DNA damaging agents through disruption of homologous recombination. *Molecular Cancer Research*. doi:10.1158/1541-7786.MCR-18-1335 (\*equal contribution)
  - a. Press from [Colorado Cancer Blog](#)
3. Teemu D Laajala, Travis Gerke, Svitlana Tyekucheva, **James C Costello**. Modeling genetic heterogeneity of drug response and resistance in cancer. *Current Opinions in Systems Biology*. 17: 8-14. (invited article)
4. Andrew Goodspeed, Annie Jean, **James C Costello**. A whole-genome CRISPR screen identifies a role of MSH2 in cisplatin-mediated cell death in muscle-invasive bladder cancer. *European Urology* 75(2):242-250.
  - a. Press in the [Oncology Learning Network](#)
  - b. Commentary in [European Urology](#)
5. Michael UJ Oliphant, Melanie Y Vincent, Matthew Galbraith, Ahwan Pandey, Vadim Zaberezhnyy, Pratyaydipta Rudra, K R Johnson, **James C Costello**, Debashis Ghosh, James V DeGregori, Joaquin M Espinosa, Heide L Ford. Six2 mediates late-stage metastasis via direct regulation of Sox2 and induction of a cancer stem cell program. *Cancer Research*. 79(4):720-734.
6. Megan M Tu, Francis YF Lee, Robert T Jones, Abigail K Kimball, Elizabeth Saravia, Robert F Graziano, Brianne Coleman, Krista Menard, Jun Yan, Erin Michaud, Han Chang, Hany Abdel-Hafiz, Andrii Rozhok, Jason E Duex, Neeraj Agarwal, Ana Chauca-Diaz, Linda K Johnson, Terry L Ng, John C Cambier, Eric T Clambey, **James C Costello**, Alan J Korman, Dan Theodorescu. Targeting DDR2 enhances tumor response to anti-PD1 immunotherapy. *Science Advances*. 5(2):eaav2437.
7. Brian Ross, **James C Costello**. Improved inference of chromosome conformation from images of labeled loci. *F1000Research* 7(ISCB Comm J):1521 (doi: [10.12688/f1000research.16252.1](https://doi.org/10.12688/f1000research.16252.1))

**2018**

8. Michael Morgan, Brent Fitzwalter, Rani K Powers, Charles R. Owens, Graciela Gamez, **James C. Costello**, Dan Theodorescu, and Andrew Thorburn. (2018) Selection for metastasis leads to increased sensitivity to lysosomal inhibitors. *Proceedings of the National Academy of Sciences* 115(36):E8479-E8488.
9. Brian C Ross, Mayla Boguslav, Holly Weeks, **James C Costello** (2018) Modeling heterogeneous populations using Boolean networks. *BMC Systems Biology* 12(1):64.
10. Andrew Goodspeed, Annie Jean, Dan Theodorescu, **James C Costello**. (2018) A gene expression signature predicts bladder cancer cell line sensitive to EGFR inhibition. *Bladder Cancer* 4(3):269-282.
11. Diogo M Camacho, Katherine M Collins, Rani K Powers, **James C Costello\***, James Collins\*. (2018) Next-generation machine learning for biological networks *Cell* 173:1581-92. (\*Co-senior author)
  - a. Auffray C and De Meulder B: F1000Prime Recommendation of [Camacho DM et al., Cell 2018 173(7):1581-1592]. In F1000Prime, 16 Sep 2019; 10.3410/f.733392063.793564997
12. Tahlita Zulverloon, Florus C. de Jong, **James C Costello**, Dan Theodorescu. (2018) Systematic Review: Characteristics and preclinical uses of bladder cancer cell lines. *Bladder Cancer* 4(2):169-183.
13. Rani Powers, Harrison Pielke-Lombardo, Andrew Goodspeed, Aik-Choon Tan, **James C Costello** (2018) GSEA-InContext: Identifying novel and common patterns in expression experiments. *Bioinformatics* 34(13):i555-64.
  - a. *Proceedings paper at the 2018 ISMB conference*
  - b. *Winner of the Ian Lawson Von Toch Memorial Award for Outstanding Student Paper*
  - c. *Colorado Cancer Blog post about Rani Powers*
14. Rebecca L Vartuli, Hengbo Zhou, Lingdi Zhang, Rani K Powers, Jared Klarquist, Pratyaydipta Rudra, Melanie Y Vincent, Debashis Ghosh, **James C Costello**, Ross M Kedl, Jill E Slansky, Rui Zhao, Heide L Ford. (2018) Eya3 enhances breast cancer progression via threonine phosphatase mediated upregulation of PD-L1 and resultant immune suppression. *JCI* 128(6)2535-2550.

**2017**

15. Josh Lewis Stern, Richard D. Paucek, Franklin W. Huang, Mohamoud Ghandi, Ronald Nwumeh, **James C Costello**, Thomas R Cech. (2017) Allele-specific DNA methylation and its interplay with epigenetic histone marks at promoter-mutated TERT genes. *Cell Reports* 21(13):3700-3707.
16. Fatemeh Seyednasrollah<sup>†</sup>, Devin C Koestler<sup>†</sup>, Tao Wang<sup>†</sup>, Stephen R Piccolo, Roberto Vega, Russ Greiner, Christiane Fuchs, Eyal Gofer, Luke Kumar, Russell D Wolfinger, Kimberly Kanigel Winner, J Christopher Bare, Elias Chiabub Neto, Thomas Yu, Liji Shen, Kald Abdallah, Thea Norman, Gustavo Stolovitzky, PCC-DREAM Community, Howard Soule, Christopher J Sweeney, Charles J Ryan, Howard I Scher, Oliver Sartor, Laura L Elo<sup>‡</sup>, Fang L Zhou<sup>‡</sup>, Justin Guinney<sup>‡</sup>, **James C Costello**<sup>‡</sup> (2017) A DREAM Challenge to build prediction models for short term discontinuation of docetaxel in metastatic castration-resistant prostate cancer. *JCO Clinical Cancer Informatics* 1:1-15.
  - a. *Selected as a top 3 paper for the IMIA yearbook of Medical Informatics 2018 in the section 'Cancer Informatics'*
  - b. *Colorado Cancer blog post*
  - c. *Business wire post. Picked up my 18 new outlets*
17. Kimberly Kanigel Winner and **James C Costello**. A spatiotemporal model to simulate chemotherapy regimens for heterogeneous bladder cancer metastases to the lung. (2017) *Pacific Symposium for Biocomputing* 22:611-622.
18. Justin Guinney<sup>†</sup>, Tao Wang<sup>†</sup>, Teemu D Laajala<sup>†</sup>, Prostate Cancer Challenge DREAM Community, Kimberly Kanigel Winner, J Christopher Bare, Elias Chaibub Neto, Suleiman A Khan, Gopalacharyulu Peddinti, Antti Airola, Tapio Pahikkala, Tuomas Mirtti, Thomas Yu, Brian M Bot, Liji Shen, Kald Abdallah, Thea Norman, Stephen Friend, Gustavo Stolovitzky, Howard Soule, Christopher J Sweeney, Charles J Ryan, Howard I Scher, Oliver Sartor, Yang Xie, PhD<sup>‡</sup>, Tero Aittokallio<sup>‡</sup>, Fang Liz Zhou<sup>‡</sup> and **James C Costello**<sup>‡</sup> (2017) Prediction of overall survival for patients with metastatic castration-resistant prostate cancer: development of a prognostic model through a crowdsourced challenge with open clinical trial data. *Lancet Oncology* 18(1):132-142.
  - a. *Elias Tillandz prize – best 2017 paper from the University of Turku*
19. Michael L. Nickerson, Nicolle Witte, Kate M. Im, Sevilyay Turan, Charles Owens, Kevin Misner, Shirley X Tsang, Zhiming Cai, Song Wu, Michael Dean, **James C Costello** and Dan Theodorescu (2017) Molecular analysis of urothelial cancer cell lines for modeling tumor biology and drug response. *Oncogene* 36(1):35-46.
  - a. *Colorado Cancer blog post*
20. Hengbo Zhou and **James C Costello** (2017) All paths lead to TRIM25. *Trends in Cancer* 3(10):673-5. (invited)

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21. Teemu D. Laajala, Justin Guinney, and **James C Costello**. Community mining of open clinical trial data. *Oncotarget* 8(47):81721-2. (invited)

## **2016**

22. Forest Andrews, Qiong Tong, Kelly D Sullivan, Evan M Cornett, Yi Zhang, Muzaffar Ali, JaeWoo Ahn, Ahway Pandey, Angela H Guo, Brian D Strahl, **James C Costello**, Joaquin M Espinosa, Scott B Rothbart, Tatiana G Kutateladze (2016) Multivalent chromatin engagement and inter-domain crosstalk regulate MORC3 ATPase. *Cell Reports* 16(12):3195-207.
23. Neeraj Agarwal, Garrett M Dancik, Andrew Goodspeed, **James C Costello**, Charles Owens, Jason E. Duex and Dan Theodorescu (2016) GON4L drives cancer growth through a YY1-androgen receptor-CD24 axis. *Cancer Research* canres. 1099.2016.
24. Julio Saez-Rodriguez, **James C. Costello**, Stephen H. Friend, Michael R. Kellen, Lara Mangravite, Pablo Meyer, Thea Norman, and Gustavo Stolovitzky (2016) Crowdsourcing biomedical research: leveraging communities as innovation engineers. *Nature Reviews Genetics* 17(8):470-86.  
a. *Pacific Standard post*. [Why Science Should be Crowdsourced – Sometimes.](#)
25. Andrew Goodspeed, Laura M Heiser, Joe W Gray, **James C Costello** (2016) Tumor-derived cell lines as molecular models of cancer pharmacogenomics. *Molecular Cancer Research* 14(1):3-13.
26. Elias Chaibub Neto, Bruce R. Hoff, Chris Bare, Brian M. Bot, Thomas Yu, Lara Mangravite, Andrew D. Trister, Thea Norman, Pablo Meyer, Julio Saez-Rodriguez, **James C. Costello**, Justin Guinney, Gustavo Stolovitzky (2016) Reducing overfitting in challenge-based competitions. *arXiv* 1607.00091.

## **2015**

27. Erin M Griner, Garrett M Dancik, **James C Costello**, Charles Owens, Sunny Guin, Michael G Edwards, David L Brautigan and Dan Theodorescu (2015) RhoC is an unexpected Target of RhoGDI2 in prevention of lung colonization of bladder cancer. *Molecular Cancer Research* 13(3):483-92.
28. Sumit Borah, Linghe Xi, Arthur J Zaug, Natasha M Powell, Garrett M Dancik, Scott Cohen, **James C Costello**, Dan Theodorescu and Tom Cech (2015) TERT promoter mutations and telomerase reactivation in Urothelial Cancer. *Science* 347(6225):1006-10.  
a. *Colorado Cancer blog post*
29. Lindsey Ulkus Rodrigues, Leah Rider, Cera Nieto, Lina Romero, Anis Karimpour-Fard, Massimo Loda, M Scott Lucia, Min Wu, Lihong Shi, Adela Camic, S Joseph Sirintrapun, Rosalie Nolley, Colton Pac, Haitao Chen, Donna M Peehl, Jianfeng Xu, Wennuan Liu\*, **James C Costello\*** and Scott D Cramer (2015) Coordinate loss of MAP3K7 and CHD1 promotes aggressive prostate cancer. *Cancer Research* 75(6):1021-1034. (\*equal contribution)  
a. *Colorado Cancer blog post*
30. Thomas Cokelaer, Mukesh Bansal, Christopher Bare, Eهران Bilal, Brian Bot, Elias Chaibub Neto, Federica Eduati, Mehmet Gönen, Steven M Hill, Bruce Hoff, Jonathan R. Karr, Michael P Menden, Pablo Meyer, Raquel Norel, Abhishek Pratap, Robert J Prill, **James C Costello**, Gustavo Stolovitzky, Julio Saez-Rodriguez (2015) DREAMTools: a Python package for scoring collaborative competitions. *F1000Research* 4:1030 (doi: [10.12688/f1000research.7118.1](https://doi.org/10.12688/f1000research.7118.1)).

## **2014**

31. **James C Costello\***, Laura M Heiser\*, Elisabeth Georgii\*, Mehmet Gönen, Michael P Menden, Nicholas J Wang, Mukesh Bansal, Muhammad Ammad-ud-din, Petteri Hintsanen, Suleiman A. Khan, John-Patrick Mpindi, NCI DREAM Community, Olli Kallioniemi, Antti Honkela, Tero Aittokallio, Krister Wennerberg, James J Collins, Dan Gallahan, Dinah Singer, Julio Saez-Rodriguez, Samuel Kaski, Joe W Gray, and Gustavo Stolovitzky (2014) A community effort to assess and improve drug sensitivity prediction algorithms. *Nature Biotechnology* 32:1202-12. (\*co-first author)  
a. *Selected by ISCB as one of the [top 10 papers of 2014](#)*  
b. *Selected for a Highlights Track presentation at ISCB 2014*  
c. *[Drug sensitivity predicted computationally.](#)*
32. Mukesh Bansal, Jichen Yang, Charles Karan, Michael P Menden, **James C Costello**, Hao Tang, Guanghua, Xiao, Yajuan Li, Jeffery Allen, Rui Zhong, Beibei Chen, Minsoo Kim, Tao Wang, Laura Heiser, Ronald Realubit, Michela Mattioli, Mariano Alvarez, Yao Shen, NCI-DREAM Community, Dan Gallahan, Dinah Singer, Julio Saez-Rodriguez, Yang Xie, Gustavo Stolovitzky, and Andrea Califano (2014) The challenge of predicting synergistic and antagonistic compound-pair activity from individual compound perturbations. *Nature Biotechnology* 32:1213-22.

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- a. *Computer model for combination therapy prediction in triple-negative breast cancer shows efficacy.* [GenomeWeb](#)
33. Chu-An Wang, David Drasin, Catherine Pham, Paul Jedlicka, Vadym Zaberezhnyv, Michelle Guney, Howard Li, Raphael Nemenoff, **James C Costello**, Aik-Choon Tan and Heide Ford (2014) The homeoprotein Six2 promotes breast cancer metastasis via transcriptional and epigenetic control of E-cadherin expression. *Cancer Research* 74(24):7357-70.
34. Michael L Nickerson, Garrett M Dancik, Kate M Im, Michael G Edwards, Sevilay Turan, Joseph Brown, Christina Ruiz-Rodriguez, Charles Owens, **James C Costello**, Guangwu Guo, Shirley X Tsang, Yingrui Li, Quan Zhou, Zhiming Cai, Lee E Moore, M Scott Lucia, Michael Dean, and Dan Theodorescu (2014) Concurrent Alterations in *TERT*, *KDM6A*, and the BRCA Pathway in Bladder Cancer. *Clinical Cancer Research* 20:2935-48.
  - a. [Colorado Cancer blog post](#)
35. **James C Costello** and Dan Theodorescu (2014) International Progress: From cytology to genomics. Decade in review -Bladder cancer. *Nature Reviews Urology* 11:609-11.
36. **James C Costello** and Gustavo Stolovitzky. (2014) Seeking the wisdom of crowds through challenge-based competitions in biomedical research. *Clinical Pharmacology & Therapeutics* 93:396-98.
  - a. *Journal cover image*

### 2013

37. Ran Xue, Mikhail N Zakharov, Yu Xia, Shalender Bhasin, **James C Costello**, Ravi Jasuja (2013) EPSLiM: Ensemble predictor for short linear motifs in nuclear hormone receptors. *Molecular Endocrinology* 28(5):768-77.
38. Ravi Jasuja, **James C Costello**, Samudra Gangopadhyay, Rajan Singh, Vandana Gupta, Gianluca Toraldo, Hyeran Jang, Hu Li, Carlo Serra, Wen Guo, Pritibha Chauhan, Navjot S Narula, Ayla Ergun, Katie Spina, Thomas G Travison, James Collins, and Shalender Bhasin (2013) Combined administration of testosterone plus an ornithine decarboxylase inhibitor as a selective prostate-sparing anabolic therapy. *Aging Cell* 13(2):303-10.
39. Roi Gazit, Brian S Garrison, Tata N Rao, Tal Shay, **James C Costello**, Jeff Ericson, Francis Kim, James J Collins, Aviv Regev, Amy J Wagers, Derrick J Rossi, and The ImmGen Consortium (2013) Transcriptome analysis identifies regulators of hematopoietic stem and progenitor cells. *Stem Cell Reports* 1:266-80.
40. Ayla Ergun, Graeme Doran, **James C Costello**, Henry H Paik, James J Collins, Diane Mathis, Christophe Benoist, and ImmGen Consortium (2013) Differential splicing across immune system lineages. *Proceedings of the National Academy of Sciences* 110:14324-29.
41. Sameer Kalghatgi, **James C Costello**, Catherine Spina, Anthony Molina, and James J Collins (2013) Bactericidal antibiotics induce mitochondrial dysfunction and oxidative damage via a common mechanism in mammalian cells. *Science Translational Medicine* 5:190ra81.
  - a. Kurilla M: F1000Prime Recommendation of [Kalghatgi S et al., Sci Transl Med 2013 5(192):192ra85]. In F1000Prime, 31 Jul 2013; 10.3410/f.718042423.793480715
  - b. Piddock L and Anuforum O: F1000Prime Recommendation of [Kalghatgi S et al., Sci Transl Med 2013 5(192):192ra85]. In F1000Prime, 03 Sep 2013; 10.3410/f.718042423.793482481

### 2012 and older

42. Lawrence Kwong, **James C Costello**, Huiyun Liu, Giannicola Genovese, Shan Jiang, Joseph H Jeong, Ryan P Bender, James J Collins, and Lynda Chin (2012) RAS acts as a multi-state rheostat to differentially regulate survival and proliferation in cancer. *Nature Medicine* 18:1503-10.
  - a. White F: F1000Prime Recommendation of [Kwong LN et al., Nat Med 2012 18(10):1503-1510]. In F1000Prime, 23 May 2016; 10.3410/f.718770312.793518438
43. Daniel Marbach\*, **James C Costello**\*, Robert Kueffner\*, Nicole M Vega, Robert Prill, Diogo M Camacho, Kyle R Allison, the DREAM5 Consortium, Manolis Kellis, James J Collins, and Gustavo Stolovitzky (2012) Wisdom of crowds for robust gene network inference. *Nature Methods* 9(8):796-804. (\*co-first author)
  - a. *Journal cover image*
  - b. *Subject of 6 separate [blog posts](#)*
44. Jennifer C Miller, Brian D Brown, Tal Shay, Emmanuel L Gautier, Vladimir Jojic, **the Immunological Genome Project Consortium**, and *et al.* (2012) Deciphering the transcription network of the dendritic cell lineage. *Nature Immunology* 13:888-99.
45. Natalia A Bezman, Charles C Kim, Joseph C Sun, Gandula Min-Oo, Deborah W Hendricks, **the Immunological Genome Project Consortium**, and *et al.* (2012) Molecular definition of the identity and activation of natural killer cells. *Nature Immunology* 13:1000-09.

46. Kavitha Narayan, Katelyn E Sylvia, Nidhi Malhotra, Catherine C Yin, Gregory Martens, **the Immunological Genome Project Consortium**, and *et al.* (2012) Intrathymic programming of effector fates in three molecularly distinct gamma-delta T cell subtypes. *Nature Immunology* 13:511-18.
47. Deepali Malhotra, Anne L Fletcher, Jilian Astarita, Veronika Lukas-Kornek, Prakriti Tayalia, **the Immunological Genome Project Consortium**, and *et al.* (2012) Transcriptional profiling of stroma from inflamed and resting lymph nodes defines immunological hallmarks. *Nature Immunology* 13:499-510.
48. Michio W Painter, Scott Davis, Richard R Hardy, Diane Mathis, Christophe Benoist, and **the Immunological Genome Project Consortium**. (2011) Transcriptomes of the B and T lineages compared by multiplatform microarray profiling. *Journal of Immunology* 186(5):3047-57.
49. **James C Costello**, Mehmet M Dalkilic, Scott M Beason, Jeff R Gehlhausen, Rupali Patwardhan, Sumit Middha, Brian D Eads, and Justen R Andrews (2009) Gene networks in Drosophila melanogaster: Integrating experimental data to predict gene function. *Genome Biology* 10:R97.
50. Teiya Kijimoto, **James C Costello**, Zuoqian Tang, Armin P Moczek, and Justen R Andrews (2009) EST and microarray analysis of horn development in Onthophagus beetles. *BMC Genomics* 10:504.
51. Daniel R Schrider, **James C Costello**, and Matthew W Hahn (2009) All human-specific gene losses are present in the genome as pseudogenes. *Journal of Computational Biology* 16:1419-27.
52. **James C Costello**, Daniel R Schrider, Jeff R Gehlhausen, and Mehmet M Dalkilic (2009) Data-driven ontologies. *Pacific Symposium on Biocomputing* 14:15-26.
53. Yong Li, **James C Costello**, Alisha K Holloway, and Matthew W Hahn (2008) Reverse ecology and the power of population genomics. *Evolution* 62:2984-94.
54. **James C Costello**, Mira V Han, and Matthew W Hahn (2008) Limitations of pseudogenes in identifying gene losses. *In Proceedings of Recomb-CG* Paris, France
55. **James C Costello**, Amy Cash, Mehmet M Dalkilic, and Justen R Andrews (2008) Data Pushing: a Fly-centric guide to Bioinformatics tools. *Fly* 2(1):1-18.
56. Mehmet M Dalkilic, **James C Costello**, Wyatt Clark, and Predrag Radivojac (2008) From protein-disease associations to disease informatics. *Frontiers in Bioscience* 13:3391-3407.
57. Drosophila 12 Genomes Consortium\* (2007) Evolution of genes and genomes on the Drosophila phylogeny. *Nature* 450(7167):203-218. (\*Consortium member)
58. **James C Costello**, Jade Buchannan-Carter, Mehmet M Dalkilic, and Justen R Andrews (2007) Integrating Drosophila data to discover disease-related protein interactions in human. *IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology* Honolulu, HI
59. Mehmet M Dalkilic, Wyatt Clark, **James C Costello**, and Predrag Radivojac (2006) Using compression to identify classes of inauthentic texts. *In Proceedings SIAM Conference on Data Mining* Bethesda, MD. 603-607.
60. Brian Eads, Amy Cash, Kevin Bogart, **James C Costello**, and Justen R Andrews (2006) Troubleshooting microarray hybridizations. *Methods in Enzymology* 411:34-49.
61. Mehmet M Dalkilic and **James C Costello**. (2004) BioKnOT: Biological Knowledge through Ontologies and TFIDF. *In Proceedings ACM SIGIR Workshop: Search and Discovery in Bioinformatics* Sheffield, UK. 2004
62. Mehmet M Dalkilic, **James C Costello**, and Arjitt Sengupta (2004) Semantic Thumbnails: A novel method for summarizing document collections. *In Proceedings ACM SIGDOC* Memphis, TN
63. Kazuhiro Seki, **James C Costello**, Vasanth Singhan, and Javed Mostafa (2004) TREC 2004 genomic track experiments. *In Proceedings of TREC 2004; Genomics Track* 2004

#### *Media/Interviews/Perspectives*

1. CU Cancer Center project makes big data analysis accessible to Anschutz Campus researchers. Colorado Cancer Blogs. Dec. 5, 2019. <https://coloradocancerblogs.org/data-analysis-tools-anschutz/>
2. Search tightens for genes driving prostate cancer. Colorado Cancer Blogs. Sep. 12, 2019. <https://coloradocancerblogs.org/u01-targeted-treatment-prostate-cancer/>
3. Scientists don't have to travel alone; solutions can come from the crowd. *Atlas of Science*. September 21, 2017. <http://atlasofscience.org/scientists-dont-have-to-travel-alone-solutions-can-come-from-the-crowd/>
4. Crowdsourcing better predictive models. *Prostatepedia*. May 2017. <https://www.prostatepedia.net/>
5. Community-wide effort to use open clinical trial data for the quantitative prediction of outcomes in metastatic prostate cancer. *Practice Update*. April 29, 2015. <https://www.practiceupdate.com/content/community-wide-effort-to-use-open-clinical-trial-data-for-the-quantitative-prediction-of-outcomes-in-metastatic-prostate-cancer/23507/12/3/1>
6. Prediction mutations in high-grade bladder cancer. *Practice Update*. Feb 15, 2015. <https://www.practiceupdate.com/content/predictive-mutations-in-high-grade-bladder-cancer/21874/12/3/1>

## PRESENTATIONS AND INVITED LECTURES

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### Local

- “Computing Resources at the Anschutz Medical Campus” Panel Member. Department of Biostatistics and Informatics. University of Colorado Anschutz Medical Campus, Aurora, CO. 2019
- “Putting your –omic data into context” Department of Endocrinology. University of Colorado Anschutz Medical Campus, Aurora, CO. 2019
- “A systems biology approach to study aggressive molecular subtypes in prostate cancer” Donald King Symposium. University of Colorado Anschutz Medical Campus, Aurora, CO. 2019
- “Pathway analysis in context” Tumor Host Interaction Symposium. University of Colorado Anschutz Medical Campus, Aurora, CO. 2019
- “Everything you need to know about gene set enrichment analysis” BBSR University of Colorado Anschutz Medical Campus, Aurora, CO. 2018
- “GSEA-InContext: Identifying novel and common patterns in expression experiments” Bioinformatics Journal Club. University of Colorado Anschutz Medical Campus, Aurora, CO. 2018
- “Trisomy 21 results in upregulation of kynurenine and dysregulation of tryptophan metabolism” Linda Crnic Super Group. University of Colorado Anschutz Medical Campus, Aurora, CO. 2018
- “A systems biology approach to study aggressive subtypes in prostate cancer” Division of Endocrinology, Metabolism and Diabetes. University of Colorado Anschutz Medical Campus, Aurora, CO. 2017
- “Data integration and cancer systems biology” Integrative Biology Department. University of Colorado Denver, Denver. CO. 2017
- “Computational Approaches for Predicting Drug Sensitivities and Synergies from Genomics Data” Array BioPharma. Boulder, CO 2015.
- “Transcriptional Regulators Associated with Pathways: Setting a TRAP to Identify Gene Drug Targets” Front Range Computational and Systems Biology 2015 Symposium. Fort Collins, CO 2015.
- “Computational Approaches for Predicting Drug Sensitivities and Synergies” Cancer Biology Training Program. University of Colorado Anschutz Medical Campus, Aurora, CO. 2015.
- “Extracting Predictive Signatures from Heterogeneously Sampled Cancer Patient Data” University of Colorado Cancer Center, Aurora, CO. 2015.
- “Transcriptional Regulatory Associations with Pathways: Setting a TRAP to identify drug-gene targets” Division of Endocrinology, Metabolism and Diabetes. University of Colorado Anschutz Medical Campus, Aurora, CO. 2014.
- “Whole exome sequence analysis of 40 human bladder cancer cell lines” University of Colorado Cancer Center Retreat. University of Colorado Anschutz Medical Campus, Aurora, CO. 2014.
- “The analysis revolution: The shift from data generation to data interpretation” Graduate Program in Pharmacology Student Symposium. University of Colorado Anschutz Medical Campus, Aurora, CO. 2014.
- “Transcriptional Regulatory Associations with Pathways: Setting a TRAP to identify drug-gene targets” Computational Bioscience Program. University of Colorado Anschutz Medical Campus, Aurora, CO. 2014.
- “Predicting, targeting, and validating a drug combination therapy for melanoma” for the Mini-symposium on The Power of Informatics to Advance Health. University of Colorado Anschutz Medical Campus, Aurora, CO. 2014.

### National

- “Systems biology approaches predict therapeutic response and investigate experiments in context” *Department of Biomedical Engineering. Oregon Health Sciences University. Portland, OR. 2019*
- “A systems biology approach to study aggressive subtypes in prostate cancer” (Keynote) *Rocky Mountain Bioinformatics Conference. Snowmass, CO 2017.*
- “The Prostate Cancer DREAM Challenge: Community efforts to mine open clinical trial data” *Project Data Sphere Symposium V. Rockville, MD 2017.*
- “Network-based models: from predicting protein function in Drosophila to identifying drug targets in cancer” *Laboratory of Cellular and Developmental Biology. NIDDK/NIH. Bethesda, MD 2016.*
- “Urothelial cancer cell line models of tumor biology and drug response” *ISMB. Orlando, FL 2016.*
- “Introduction to the DREAM Prostate Cancer Challenge” *Recomb/ISCB Conference on Regulatory & Systems Genomics with DREAM Challenges. Philadelphia, PA 2015.*
- “Characterizing bladder cancer cell lines as models of solid tumor biology” *Rocky Mountain Bioinformatics Conference. Aspen, CO. 2014.*
- “Predicting survival for diverse patient cohorts using large-scale cancer genomics data” *Rocky Mountain*

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*Bioinformatics Conference*. Aspen, CO. 2014.

- “Integrative Genomics Approaches for Predicting Drug Synergies” *Rocky Mountain Bioinformatics Conference*. Aspen, CO. 2014.
- “A community effort to assess drug sensitivity prediction algorithms identifies approaches for improved performance” *ISMB 2014 Highlights Track*. Boston, MA. 2014.
- “Translating genomics data into actionable models to discover novel therapeutics” *University of Illinois*. Champaign, IL. 2013.
- “Translating genomics data into actionable models to discover novel therapeutics” *Worcester Polytechnic Institute*. Worcester, MA. 2013.
- “Translating genomics data into actionable models to discover novel therapeutics” *University of Colorado School of Medicine, Department of Pharmacology*. Denver, CO. 2012.
- “Wisdom of crowds for constructing gene networks and predicting drug sensitivities” *The 10<sup>th</sup> Annual Rocky Mountain Bioinformatics Conference*. **Keynote Speaker**. Snowmass Village, CO. 2012.
- “NCI-DREAM drug sensitivity challenge: evaluation and results” *The DREAM Conference*. San Francisco, CA. 2012.
- “DREAM5 network inference challenge: The wisdom of crowds” *NCI-DREAM Summit*. Bethesda, MD. 2012.
- “Wisdom of crowds for gene network inference” *International Conference on Systems Biology of Human Disease*. Boston, MA. 2011.
- “Identifying key gene regulatory relationships underlying mechanical induction of ECM scaffold during tooth organ development” *SysCode Retreat*. Waltham, MA. 2011.
- “Alternative splicing in the Immunological Genome Project” *The Immunological Genome Retreat*. Boston, MA. 2011.
- “Network Biology approaches to discover drug synergies” *Vertex Pharmaceuticals*. Cambridge, MA. 2011
- “Experimental assessment of DREAM5 network inference predictions” *The DREAM conference*. New York, NY. 2010.
- “Data integration and gene function prediction in *Drosophila melanogaster*” *Boston University*. Boston, MA. 2009.
- “Data integration and gene function prediction in *Drosophila melanogaster*” *The Jackson Laboratory*. Bar Harbor, ME. 2009.
- “Data integration and gene function prediction in *Drosophila melanogaster*” *Broad Institute*. Boston, MA. 2009.

#### *International*

- “Predicting therapeutic sensitivity and resistance” *AACR Educational Session, Systems Biology Approaches in Cancer*. Atlanta, GA, USA. 2019
- “DREAM Challenges” *Intelligent Systems for Molecular Biology*. Chicago, IL, USA. 2018
- “GSEA-InContext: Identifying novel and common patterns in expression experiments” *Intelligent Systems for Molecular Biology*. Chicago, IL, USA. 2018
- “Addressing biomedical research challenges: the community and the individual” *Polish Bioinformatics Society*. Białystok, Poland. 2016.

## **RESEARCH FUNDING**

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### *Pending*

**R21-A1 National Institutes of Health, National Cancer Institute (Tyekucheva, Costello)**

*Curated prostate cancer data for novel and reproducible prognostic modeling*

Role: MPI, 250k direct

### *Active*

**R01 AI150305-01 – NIH/NIAID (Espinosa)**

09/2019 – 03/2024

*Understanding Down syndrome as an interferonopathy*

Role: Collaborator, \$2.0M direct (\$1M to Costello)

**U01 CA231978-01A1 – NIH/NCI (Costello, Cramer)**

09/2019 – 08/2024

*Systems analysis of aggressive prostate cancer pathology*

Role: MPI (Contact PI), \$9M direct (\$80k to Costello)



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**AWD G-40093-01, Anschutz Foundation (Costello, Duval)**

07/2017 – 07/2020

*Transforming the cancer drug development paradigm by integrating precision medicine in companion animals with naturally occurring cancers.*

Role: MPI, \$375k direct

**1 R01 CA199741-01 – NIH/NCI (Cramer, Lucia)**

07/2015 – 07/2020

*Coordinate loss of CHD1 and MAP3K7 with other CNAs in prostate cancer aggressiveness*

Role: Co-I, \$1.5M direct (\$145k to Costello)

**5 P30 CA046934-31 – NIH/NCI (Schulick)**

04/1997 – 01/2022

*University of Colorado Cancer Center Support Grant*

Role: Director of Bioinformatics Shared Resource, (35% salary support)

**2 R01 GM099705-05 – NIH/NIGMS (Cech)**

04/2016 – 04/2021

*TERT Promoter Mutations and Telomerase Reactivation in Cancer Cells*

Role: Collaborator, \$750k direct (\$90k to Costello)

**Bristol-Meyers Squibb research grant (Bridges)**

09/2019 – 08/2020

*RA-DREAM Challenge: Automated Scoring of Radiographic Damage in Rheumatoid Arthritis*

Role: Challenge Director, \$200k direct (\$17k to Costello)

*Completed*

**Cancer League of Colorado (Costello, Cramer)**

07/2018 – 07/2019

*Targeting the Achilles heel of prostate cancer with loss of CHD1 and MAP3K7*

Role: MPI, \$60k direct

**AWD-173685, Cancer League of Colorado (Costello)**

07/2017 – 12/2018

*Measuring chromosome-conformation abnormalities within a single cancer cell*

Role: PI, \$30k direct

**AWD-152792, Boettcher Foundation Webb-Waring Research Award (Costello)**

07/2015 – 07/2018

*Defining and targeting bladder cancer subtypes through pan-cancer pharmacogenomic profiling*

Role: PI, \$225k direct

**Colorado Advanced Industry Accelerator Program (Costello)**

06/2016 – 07/2017

*PrecisionProfileDx: A genomics workbench solution to accelerate insights for cancer treatment*

Role: PI, \$142k direct

**AWD-153400, Cancer League of Colorado (Costello)**

07/2015 – 07/2016

*Integrating transcriptional regulatory and metabolic networks to characterize bladder cancer cellular response to chemotherapies*

Role: PI, \$30k direct

**2014 Pilot Grant, Denver Chapter of Golfers Against Cancer (Costello, Theodorescu)**

09/2014 – 09/2016

*Identifying predictive markers of bladder cancer patient response to chemotherapeutics*

Role: Co-PI, \$50k direct

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**Meyn Foundation Prostate Cancer Program (Cramer, Costello, Lucia)**

04/2014 – 04/2016

*Identification of Driver Pathways in Prostate Cancer-Associated Fibroblasts*

Role: Co-PI, \$50k direct

**IRG 57-001-53, American Cancer Society – Institutional Resource Grant**

01/2015 – 01/2016

*Co-deletion of MAP3K7 and CHD1 as drivers in bladder cancer*

Role: PI, \$30k direct

*Student Fellowships*

**Andrew Goodspeed** – T32 Pharmacology Training Grant; Front Range Cancer Challenge (\$50,000)

**Rani Powers** – NSF GRFP (Honorable mention); Linda Crnic Institute, Blumenthal Down Syndrome Predoctoral Fellowship (\$40,000)

**HONORS AND AWARDS**

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Winning team for the CD2H Idea Competition for the CTSA Program	2019
Rani Powers, Winner of the Ian Lawson Von Toch Memorial Award for Outstanding Student Paper	2018
Top 3 paper for the IMIA yearbook of Medical Informatics 2018 in the section 'Cancer Informatics'	2018
Elias Tillandz prize – best 2017 paper from the University of Turku	2018
Boettcher Investigator, Webb-Waring Biomedical Research Award	2015
Sage Bionetworks Young Investigator Award	2013
Best Poster Award at the Intl. Conf. for Systems Biology of Human Disease	2011
First Ph.D. awarded from IU School of Informatics	2009
NSF-IGERT Fellow in Evolution, Genomics, and Development	2009
Student Travel Grant for PSB, ISCB	2009
Student Travel Grant for CIBCB, IEEE	2007
Student Travel Grant for SDM, Lawrence Livermore National Laboratory	2006
IU School of Informatics Outstanding Teaching Award	2004
IU School of Informatics Outstanding Achievement Award	2004
IU GPSO Outstanding Graduate Student	2004
Indiana University (UITS) Consultant of the Month	2003
Two-time Track and Field Athletics All-American	2002

**FORMAL TEACHING AND MENTORING**

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*Courses*

**Spring 2016, 2018 – CPBS7630** – Instructor, Computational Methods for Addressing Big Data Challenge in Biomedicine

*Lectures*

**Spring 2014-2019 – CPBS7712** – Taught 2 lectures on data integration, network inference

**Spring 2017-2019 – CANB7600** – Taught 1 lecture on Cancer Informatics resources and Systems Biology

**Fall 2014-2018 – CPBS7711** – Taught 2 lectures on genomic analysis

**2014-2019 – Journal Clubs** – Biomedical Sciences, Pharmacology

**Fall 2014-2019 – PHCL7600** – Taught 1 lecture on genomic analysis in pharmacology

**Spring 2015-2019 – PHCL7620** – Taught 1 course on next-gen drug target identification

**Fall 2015, 2016 – PHCL7605** – Led group discussions on ethics in research

**Fall 2015 – BIOS6660** – Taught 2 lectures on predicting drug sensitivity

**Fall 2016 – BSBT6111** – Taught 1 lecture on open-data and open-science

*Mentoring*

**Graduate Students**

Andrew Goodspeed – Pharmacology – graduated 10/18 – Manager of the UCCC Bioinformatics Core

Rani Powers – Computational Biosciences – graduated 8/19 – Senior Staff Scientist at the Wyss Institute

Robert Jones – MSTP (co-advised with Theodorescu) - current

**Thesis Committee**

D. Suzi Bryan – Molecular Biology,

Kyle Smith – Computational Biosciences (chair),

Katie Mishall – Cancer Biology

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Patrick Cherry – Biochemistry and Molecular Genetics  
Michael Oliphant – Reproductive Science  
Jessica Hsu – Pharmacology (chair)  
Callie Federer – Computational Biosciences (chair)  
Cody Glickman – Computational Biosciences  
Robert Jones – Pharmacology (chair)  
Sean Korpela – Pharmacology  
Johannes Menzel – Molecular Biology  
Nan Chen – Pharmacology (chair)  
Mayla Boguslav – Computational Biosciences (chair)  
Harrison Pielke-Lombardo – Computational Biosciences  
Laura Stevens – Computational Biosciences (chair)

**Postdoctoral Researcher**

Teemu (Daniel) Laajala – current  
Brian Ross – Independent consultant  
Kim Kanigel-Winner – Now a Data Analyst with Rancho Bioscience, San Diego, CA  
Somsak Phattarasukol – returned to Thailand

**Rotation Students**

Jessica Hsu – Pharmacology  
Gregory Wright – Biomedical Sciences Program  
Callie Federer – Computational Bioscience  
Sean Korpela – Pharmacology  
Robert Jones – Medical Science Training Program  
Mayla Boguslav – Computational Bioscience  
Harrison Pielke-Lombardo – Computational Biosciences  
Justin Roberts – Biomedical Sciences Program  
Brent Carrillo – Pharmaceutical Sciences  
Michael Orman – Pharmaceutical Sciences

**Summer Interns**

Christian De Jong – Erasmus Medical Center - 2019  
Anthony Sun – CRSF Fellow - 2019  
Holly Weeks – MPH student at University of Colorado Anschutz Medical Campus – 2016-17  
Alex Singh – Lakewood High School – 2016 – Currently attending Carnegie Mellon University  
William Duncan Palmer – Computational Biosciences Summer Student – 2015 – Next position at Sage Bionetworks  
Becca Marion – Master’s Biostatistics Student, Université catholique de Louvain – 2015 – currently PhD student  
Amay Srivastava – Rock Canyon High School – 2015

**PROFESSIONAL SERVICE**

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**University of Colorado**

Research Advisory Council	2019-
University of Colorado Cancer Center strategic planning committee	2019
Biostatistics and Informatics faculty search committee	2019
Computational Bioscience Program postdoctoral research recruitment committee (Chair)	2018
Computational Bioscience Program admissions committee	2016-2018
Biomedical Sciences Program admissions committee	2017-
Pharmacology Program graduate training committee	2015-
Pharmacology Program retreat organizing committee (Chair 2016)	2015, 2016
Computational Bioscience Program preliminary exam committee (Chair 2018)	2015 -
Department of Pharmacology faculty search committee	2014, 2016
Pharmacology Program graduate student admissions committee	2014-

**Conference**

ACSB Committee Chair (Society Secretary)	2019-
ISMB program committee member	2018-
RSGDREAM program committee member	2017-

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Power of Informatics to Advance Health Mini Symposium (Steering Committee)	2015- 2018
ISCB/Recomb/DREAM Conference, Session Chair	2015,2017
DREAM7, "NCI-DREAM Drug Sensitivity Prediction Challenge"	2012
DREAM5, "Gene Network Inference Challenge"	2010
Daphnia Genomics Consortium	2005,2007

**Review Panel**

Natural Sciences and Engineering Council of Canada	2018
Austrian Science Foundation	2018
Cancer League of Colorado	2018
Luxembourg Institute of Health	2017
American Cancer Society, IRG review panel	2016-2018
NIH/NCI – CSBC U54 Research Centers	2016,2017
Swiss National Science Foundation	2015,2016
Helmsley Charitable Trust	2015
Joslin Diabetes Center/Boston University internal grant review member	2013
Improver scoring review committee	2013

**Journal Reviewer (ad hoc)**

Science, Nature, PLoS Computational Biology, PLoS One, Journal of Biomedical Informatics, Bioinformatics, Journal of Proteome Research, Scientific Reports, Current Pharmaceutical Design, Pacific Symposium for Biocomputing, Algorithms, Oncotarget, BMC Cancer, Nature Communications, Nature Biotechnology, Autophagy, Computing Surveys, Journal of Molecular Medicine, Cancer Cell International, Foundations of Computing and Decision Sciences, Genes, FEBS Open Bio, BMC Medical Genomics, Molecular Pharmaceutics, Cell Reports, GigaScience

Editor for DREAM Channel in F1000Research (2015-present)

**LEADERSHIP AND VOLUNTEER EXPERIENCE**

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American Cancer Society, Relay for Life - research speaker	2015
DSST (Denver) high school – Taught a class on predictive modeling in biomedicine	2015
Jim Holland Summer Enrichment Program in Biology	2005,2007,2009
IU Academic Fairness Committee Member	2002-2009
IU Graduate Curriculum Committee Member	2002-2006
Undergraduate Capstone Group Leader	2004
Lead Associate Instructor	2004
Graduate Informatics Student Association, Vice-President	2004
Volunteer Assistant Track and Field Coach, Indiana University	2003
University of Iowa Track and Field Captain	2002
Community Youth Leader, Cedar Rapids, IA	2000-2002