Michigan State University

CURRICULUM VITAE

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| **Name:** | Bin Chen, PhD |

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| **Position:** | Associate Professor |
|  | Pediatrics/Pharmacology and Toxicology |
|  | College of Human Medicine |

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| **Address:** | Secchia Center, room 732  15 Michigan St. NE  Grand Rapids, MI 49503   |  | | --- | | Michigan State University | |
|  | Email: chenbi12@msu.edu |

**EDUCATION**

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| --- | --- | --- | --- | --- |
| 2000 - 2004 | Chongqing University | B.A. | Chemistry |  |
| 2007 - 2009 | Indiana University, Bloomington | M.S. | Chemical Informatics (mentor: Dr. David Wild) |  |
| 2009 - 2012 | Indiana University, Bloomington | Ph.D. | Informatics (mentor: Dr. David Wild) |  |
| 2012 - 2015 | Stanford University | Postdoc | Translational Bioinformatics (mentor: Dr. Atul Butte) |  |

**PRINCIPAL POSITIONS HELD**

|  |  |  |  |
| --- | --- | --- | --- |
| 2015 - 2017 | University of California, San Francisco | Instructor | Pediatrics/Institute for Computational Health Sciences |
| 2017 - 2018 | University of California, San Francisco | Assistant Professor | Pediatrics/Institute for Computational Health Sciences |
| 2018 - 2022 | Michigan State University | Assistant Professor | Pediatrics/Pharmacology and Toxicology |
| 2021 - 2022 | Michigan State University | Assistant Professor | Computer Science and Engineering |
| 2022 - present | Michigan State University | Associate Professor  (w tenure) | Pediatrics (70%)/Pharmacology and Toxicology (30%)/Computer Science and Engineering (0%) |

**OTHER POSITIONS HELD**

|  |  |  |  |
| --- | --- | --- | --- |
| 2004 - 2017 | Shanghai Institute of Organic Chemistry, Chinese Academy of Science | Research Assistant |  |
| 2008 summer | Novartis | Intern |  |
| 2009 summer | Pfizer | Intern |  |
| 2010 summer | Pfizer | Intern |  |
| 2011 summer | Merck | Intern |  |
| 2012 | Novartis | Contractor |  |
| 2015-2016 | Numedii | Consultant |  |
| 2021-2022 | Katana graph | Consultant |  |

**HONORS AND AWARDS**

|  |  |  |
| --- | --- | --- |
| 2009 | Symyx Ph.D. Fellowship | Indiana University at Bloomington |
| 2010 | CINF Scholarship for Scientific Excellence | ACS Chemical Information Division |
| 2012 | Lucille Wert Scholarship | ACS Chemical Information Division |
| 2014 | Jason Morrow Trainee Award 2014 | ASCPT |
| 2014 | Presidential Trainee Award 2014 | ASCPT |
| 2015 | Presidential Poster of Distinction, 2015 | The Liver Meeting |
| 2015 | Intel Science Talent Search (Intel STS) 2015 Research Teacher |  |
| 2016 | LINCS meeting travel fellowship |  |
| 2017 | BD2K K01 Award | NIH |
| 2018 | BD2K single cell workshop travel award | NIH |
| 2019 | NIEHS Extramural Paper of the Month | NIEHS |
| 2021 | Early Career Research Excellence Award | CHM, MSU |
| 2022 | 20th Annual Great Lakes Pediatric Research Data, Expert Panelist |  |
| 2022 | APASL DISTINGUISHED SPEAKER OF THE LECTURE |  |

**KEYWORDS/AREAS OF INTEREST**

Big Data, AI, Therapeutic Discovery

**MEMBERSHIPS**

|  |  |
| --- | --- |
| 2008 - 2012 | American Chemical Society |
| 2012 - present | American Medical Informatics Association |
| 2017 - 2018 | Associate Member, UCSF cancer center |
| 2012 - present | International Society for Computational Biology |
| 2020 - present | American Association for Cancer Research |

**SERVICE TO SCHOOL AND COLLEGE**

|  |  |
| --- | --- |
| 2018 | Bioinformatics Faculty Search Committee (TSMM) |
| 2018 | GII Precision Medicine Faculty Search Committee |
| 2018- | CHM MMI interviewer (participated four times, one day every time) |
| 2019- | Student Competence Committee (appointed by the dean)  Three whole mornings every semester for meetings | CHM MMI interviewer |
| 2019- | BMS student candidate interviewer |  |
| 2020 | Chair, Big Data Research Faculty Search Committee | CHM MMI interviewer |
| 2021- | Two MSU-HFHS partnership working groups  Each workgroup meets weekly for two months | CHM MMI interviewer |
| 2021- | MSU CHM IT Committee |  |
| 2021- | Pharmacology Master Program Mentor |  |
| 2021- | BMS Inclusive Initiative Mentor |  |

**SERVICE TO PROFESSIONAL ORGANIZATIONS**

|  |  |  |
| --- | --- | --- |
| 2016 - 2016 | The Fourteenth Asia Pacific Bioinformatics Conference | organizing committee |
| 2017 - 2017 | DahShu Data Science Symposium: Computational Precision Health 2017 | organizing committee co-chair and session chair |
| 2017 - 2017 | Fanconi Anemia Research Fund | grant reviewer |
| 2017 - 2017 | Ohio Cancer Research | grant reviewer |
| 2017 - 2017 | AMIA 2018 Informatics Summit | program committee |
| 2018 - 2018 | Alzheimer's Research UK | grant reviewer |
| 2018 - 2018 | Cancer Research UK | grant reviewer |
| 2019 - 2019 | Worldwide cancer research | grant reviewer |
| 2020 – 2020 | Spectrum Heath PRF Review | grant reviewer |
| 2020/9- | Journal of Cheminformatics | Editorial Board |
| 2020 - 2020 | CCNY-MSKCC Partnership | grant reviewer |
| 2020- | Big Ten CRC Correlatives | Committee member |
| 2022-2022 | CCNY-MSKCC Partnership | Grant reviewer |
| 2022-2022 | French National Cancer Institute | Grant reviewer |
| 2022-2022 | ICIBM | program committee |
| 2022-2022 | AMIA summer summit | Session chair |

**SERVICE TO PROFESSIONAL PUBLICATIONS**

|  |  |
| --- | --- |
| 2010 - 2015 | Program Committee for STIIC 2010, BIOKDD 2011, STIIC 2011, ESWC 2012, WebS 2012, STIIC 2012, IBICA 2012, MDS 2012, WebS 2013, MDS 2013, CIKM2013, JIST 2013 |
| 2009 - 2015 | Ad hoc referee for Scientific Reports, Drug Discovery Today, Briefing in Bioinformatics, Bioinformatics Oxford, BMC Bioinformatics, BMC Medical Genomics, Journal of the American Medical Informatics Association, Journal of Chemical Information and Modeling, Journal of Cheminformatics, IEEE intelligent systems, Journal of Information Science, Knowledge and Information Systems, Social Network Analysis and Mining, Journal of Biomedical Semantics, Computers in Biology and Medicine, OMICS: A Journal of Integrative Biology, IEEE/ACM Transactions on Computational Biology and Bioinformatics, IEEE Computational Intelligence Magazine, Oxidative Medicine and Cellular Longevity, AMIA annual conference. (>50 manuscripts in 6 years) |
| 2015 - present | Ad hoc referee for Nature Communications, Nature Chemical Biology, Advanced Science, Cell Chemical Biology, Genome Medicine, Briefings in Bioinformatics, Journal of the American Medical Informatics Association, BMC Bioinformatics, Bioinformatics Oxford, BMC Cancer, BMC Cancer, PLOS Comp Biol, Scientific Data |
| 2018 - present | Guest editor for PLOS Comp Biol |
| 2020 - present | Ad hoc referee for Molecular Systems Biology, Nature Review Chemistry, Nature Machine Intelligence |
| 2021 – present | Ad hoc referee for Lancet Digital Health, British Journal of Cancer, Cell Reports Medicine, EBioMedicine |

**OTHER ACTIVITIES AND COMMUNITY OUTREACH**

July/Sep 2019, participated in the MSU/Pine Rest Core Data Group meetings (invited by Dean Dr. Norman Beauchamp)

July 2019, participated in the MSU/Siemens meeting (invited by Dean Dr. Norman Beauchamp)

August 2019, participated in the MSU & Mercy Health - Partnership Discussion Focused on Bioinformatics/AI (invited by Assistant Dean Dr. Jerry Kooiman)

Spring 2019, MSU Academic Communications Fellowship first cohort participant

Feb 2020, participated in MSU/Mary Free Bed partnership discussion (invited by Associate Dean Dr. Walt Esselman)

May 2020, participated in MSU/MiHIN Partnership Discussion (invited by Assistant Dean Dr. Jerry Kooiman)

Spring 2021, participated in MSU/Innovation Park/building design (joined with department chairs and CHM Dean, two months, 12hours in total)

**PRESENTATIONS - INTERNATIONAL**

|  |  |  |
| --- | --- | --- |
| 2014 | 8th International Conference on Systems Biology and 4th Translational Bioinformatics Conference, Qingdao, China (podium) |  |
| 2017 | Global Pharma R&D Informatics Congress 2017, Lisbon, Portugal (podium) |  |
| 2018 | Inaugural immunology and immunometabolism conference, Chongqing, China (podium) |  |
| 2018 | Chongqing University, Chongqing, China (podium) |  |
| 2018 | Army Medical University, Chongqing, China (podium) |  |
| 2018 | JSM 2018 annual meeting, Vancouver, Canada (podium) |  |
| 2019 | Fudan University, Shanghai, China (podium) |  |
| 2019 | Suzhou University, Jiangsu, China (podium) |  |
| 2020 | Department of Pharmacology Annual Symposium at the University of Toronto (keynote, canceled due to COVID-19) |  |
| 2021 | Multi-omics seminar hosted by Front Line Genomics (Virtual) |  |
| 2022 | APASL STC on HCC, Taiwan (virtual) |  |
| 2022 | 15th Annual Meeting of the Korean Society of Medical Oncology & 2022 International Conference (invited talk in Sep), Seoul, Korea |  |

**PRESENTATIONS - NATIONAL**

|  |  |  |
| --- | --- | --- |
| 2010 | 239th ACS National Meeting, San Francisco, CA (podium and poster) |  |
| 2011 | Inaugural Conference of the International Chemical Biology Society, Kansas City, MO (poster) |  |
| 2012 | Conference on Semantics in Healthcare and Life Sciences, Cambridge, MA (podium and poster) |  |
| 2012 | Bio-IT World, Boston, MA (poster) |  |
| 2013 | LINCS Symposium, Boston, MA (poster) |  |
| 2013 | American Association of Pharmaceutical Scientists annual meeting, San Antonio, TX (podium) |  |
| 2014 | American Society for Clinical Pharmacology and Therapeutics annual meeting, Atlanta, GA (podium and poster) |  |
| 2014 | AMIA Translational Bioinformatics, San Francisco, CA (poster) |  |
| 2014 | 5th Annual Mechanistic Studies in Transplantation Workshop, Atlanta, GA (podium) |  |
| 2015 | The Liver Meeting, San Francisco, CA (poster) |  |
| 2016 | Digestive Disease Week, San Diego, CA (podium) |  |
| 2017 | Big Data For Breast Cancer\West Coast Conference, Susan G. Komen, Palo Alto, CA (invited meeting) |  |
| 2017 | I-SPY2+ Retreat, St Helena, CA (invited meeting) |  |
| 2017 | University of Arizona, Tulsa, USA (invited seminar) |  |
| 2017 | University of Pennsylvania, Philadelphia, Pennsylvania, USA (invited seminar) |  |
| 2017 | Michigan State University, East Lansing, Michigan (invited seminar) |  |
| 2018 | PSB, Big Island, Hawaii (poster) |  |
| 2018 | AACR annual meeting, Chicago, IL (poster) |  |
| 2018 | 2018 Data Science Innovation Lab: Mathematical Challenges of Single Cell Dynamics, Bend, Oregon, OR (invited one week workshop) |  |
| 2018 | ICSA 2018 Applied Statistics Symposium in New Brunswick, NJ (invited talk) |  |
| 2018 | ICIBM 2018 in Los Angeles, CA ( invited talk) |  |
| 2019 | PSB, Big Island, Hawaii (poster) |  |
| 2019 | ICIBM, Columbus, Ohio (invited workshop) |  |
| 2019 | JSM 2019, Denver, CO(invited panel) |  |
| 2019 | Childhood Cancer Data Initiative, Washington DC (workshop) |  |
| 2019 | Moving Targets, USC, LA (invited talk) |  |
| 2020 | 4th Translational Genomics and Epigenomics Symposium, Buffalo NY (podium, canceled due to COVID-19) |  |
| 2020 | AMIA Annual Meeting Workshop (podium, canceled due to COVID-19) |  |
| 2020 | Invited Seminar in Cancer Biology, The University of Toledo (virtually) |  |
| 2020 | Mount Sinai MSCIC: Work in Progress (virtually) |  |
| 2021 | Sino-American Pharmaceutical Professionals Association (SAPA) Scientific Symposium (virtually) |  |
| 2022 | AMIA summit, Chicago (paper podium presentation) |  |
| 2022 | The Tri-Omics Summit, Boston, MA (invited talk in Sep) |  |

**PRESENTATIONS - REGIONAL AND OTHER INVITED PRESENTATIONS**

|  |  |  |
| --- | --- | --- |
| 2010 | Pfizer Inc., Boston, MA (podium) |  |
| 2011 | Lecture for S604, Indiana University at Bloomington, IN (lecture) |  |
| 2011 | Merck Inc., Rahway, NJ (podium) |  |
| 2011 | Lecture for S636, Indiana University at Bloomington, IN (lecture) |  |
| 2011 | Mayo Clinic, Rochester, MN (podium) |  |
| 2012 | Novartis, Boston, MA (podium) |  |
| 2015 | UCSF Precision Medicine Conference, UCSF, San Francisco, CA (podium) |  |
| 2016 | Stanford VA hospital, Palo Alto, CA (podium) |  |
| 2017 | UCSF Chinese Association Seminar, UCSF, San Francisco, CA (podium) |  |
| 2017 | UCSF, PSPG 245B Course, UCSF, San Francisco, CA (lecture & workshop) |  |
| 2017 | UC Berkeley, Department of Statistics, Berkeley, CA (podium) |  |
| 2017 | UCSF, ISPY biomarker monthly workshop, San Francisco, CA (workshop) |  |
| 2017 | UCSF 2017 Cancer Showcase, San Francisco, CA (podium) |  |
| 2017 | UCSF Brain Cancer Seminar, San Francisco, CA (podium) |  |
| 2017 | DahShu Virtual Club and SFASA Monthly Seminar, San Francisco, CA (podium) |  |
| 2017 | UCSF Hepatobiliary Cancers Research Symposium, San Francisco, CA (podium) |  |
| 2018 | UCSF BP205B, San Francisco, CA (course lecture) |  |
| 2018 | Chinese American Biopharmaceutical Society Big Data workshop, Genentech, South San Francisco, CA (podium) |  |
| 2018 | UCSF Breast Cancer Retreat, San Francisco, CA (podium) |  |
| 2018 | MSU Pediatric Research rounds, East Lansing, MI (podium) |  |
| 2018 | Big Data Ignite, Grand Rapids, MI (podium) |  |
| 2018 | MSU Drug Discovery Seminar, East Lansing, MI (podium) |  |
| 2018 | Pediatric Grand Rounds at Helen DeVos Children’s Hospital, Grand Rapids, MI (podium) |  |
| 2019 | MSU translational science seminar, East Lansing, MI (podium) |  |
| 2019 | COCOH 2019, Grand Rapids, MI (podium) |  |
| 2019 | MSU IQ seminar, East Lansing, MI (podium) |  |
| 2019 | MSU EPI seminar, East Lansing, MI (podium) |  |
| 2019 | VARI cancer center seminar, Grand Rapids, MI (podium) |  |
| 2019 | MSU Pediatric Research Retreat, Grand Rapids, MI (podium) |  |
| 2019 | MSU machine learning seminar, East Lansing, MI (podium) |  |
| 2020 | MSU COM course lecture (lecture) |  |
| 2020 | MSU Translational Bioinformatics Workshop (lecture and organizer) |  |
| 2020 | MSU Department of Physiology Seminar (virtually) |  |
| 2021 | CHM town hall panelist |  |
| 2021 | MSU Precision Oncology Symposium |  |
| 2021 | Henry Ford Health – Michigan State University joint oncology symposium |  |
| 2022 | Great Lake Pediatric Research Day (AI panel) |  |
| 2022 | Henry Ford Grand Rounds (invited talk in Aug) |  |

**SERVICE ACTIVITIES SUMMARY**

I co-founded DahShu (http://dahshu.org/) with a few faculty members from UC Berkeley and Stanford in 2015. DahShu is a non-profit organization to promote research and education in data science. We have successfully organized two data science conferences in the past two years, attracting hundreds of researchers worldwide. As a core member, I lead activities including fundraising, marketing, conference organizing, etc. and help it grow into a community of 4000 global members. Since 2017, we organize one seminar/workshop every month.

**COMMUNITY AND PUBLIC SERVICE**

|  |  |  |
| --- | --- | --- |
| 2013 - 2014 | Board member, Postdoc Department, Association of Chinese Students and Scholars at Stanford |  |
| 2015 - present | General Secretary & co-founder, DahShu |  |
| 2019 - present | Organize Grand Rapids/East Lansing Computational Biology Forum (named Big Data Journal Club before 2020) |  |

**TEACHING**

|  |  |  |
| --- | --- | --- |
| 2017 | UCSF Systems Pharmacology PSPG 245B guest lecturer |  |
| 2018 | UCSF Systems Pharmacology PSPG 245B guest lecturer |  |
| 2018 | One evening Computational drug discovery workshop to medical students at MSU |  |
| 2019 | MSU Translational Bioinformatics one-week workshop, organizer and lecturer |  |
| 2020 | MSU COM Biomedical Research Structure and Methods course, guest lecturer |  |
| 2021 | MSU Drug Discovery Course PHM809/CEM809/BMB961, lecturer |  |
| 2021 | T32 drug discovery boot camp, lecturer |  |
| 2021 | Precision Decision-Making in Agriculture and Biomedicine GEN 800, lecturer |  |
| 2021 | PHM 801—Fundamental Principles of Pharmacology & Toxicology, lecturer |  |

**PREDOCTORAL STUDENTS SUPERVISED OR MENTORED (bold means ongoing)**

| Dates | Name | Program or School | Mentor Type | Position after training |
| --- | --- | --- | --- | --- |
| 2014 - 2014 | Charles Pei | SMIR high school Stanford | Project Mentor | Undergraduate at Harvard |
| 2014 - 2014 | Rachel Wu | SMIR high school Stanford | Project Mentor | Undergraduate at MIT |
|  |  |  |  |  |
| 2015 - 2015 | Jane Wei | UCSF undergraduate freshman Intern | Project Mentor | Undergraduate at Cornell University |
| 2016 - 2016 | Tanisha Joshi | UCSF high school Intern | Project Mentor | Evergreen Valley High School |
| 2016 - 2016 | Michael Sharpnack | UCSF medical student volunteer | Project Mentor | Graduate student at Ohio State University |
| 2016 - 2016 | Jordan Spatz | UCSF medical student | Project Mentor | Graduate student at UCSF |
| 2017 - 2017 | Reuben Sarwal | UCSF undergraduate sophomore Intern | Project Mentor | UC Berkeley  undergraduate |
| 2017 - 2019 | Billy Zeng | UCSF medical student/MSU intern | Project Mentor | Graduate student at UCSF |
| 2017 - 2018 | Yuying Chen | UCSF undergraduate senior volunteer | Project Mentor | UCSF ISPY program intern |
| 2017 - 2017 | Alex Jin | UCSF high school volunteer | Project Mentor | Portledge ​High School, NYU |
|  |  |  |  |  |
| 2018- | Ke Liu | Postdoc and then Research Assistant Professor | Mentor | Professor at Shandong Uni. in China (named Qilu scholar) |
| 2018 summer | Tom Hu | Graduate Intern | Project Mentor | UC Berkeley  undergraduate |
| 2018- | **Rama Shankar** | Postdoc scholar | Mentor |  |
| 2018-2019 | Patrick Newbury | Postdoc Scholar | Mentor | Radiation oncology resident at University of Oklahoma |
| 2018-2018 | Anthony Sciarini | Undergraduate junior intern | Mentor | GVSU undergraduate |
| 2018-2018 | Keith Schmitt | Undergraduate junior intern | Mentor | GVSU undergraduate |
| 2018- | **Shreya Paithankar** | Graduate intern then lab assistant | Mentor |  |
| 2018 summer | Anita Wen | Graduate Intern | Mentor | UC Davis graduate |
| 2018- | **Jing Xing** | Postdoctoral scholar | Mentor |  |
| 2018-2018 | Omar Kana | Graduate rotation student | Mentor | MSU BMS program |
| 2018-2018 | Kasim Fassia | MSU medical student | Project mentor | MSU/CHM medical student |
| 2018-2018 | Albert Jiao | MSU medical student | Project mentor | MSU/CHM medical student |
| 2019-2020 | Rae Felismino | MSU medical student | Project mentor | MSU/COM medical student |
| 2019-2020 | Krista Young | MSU medical student | Project mentor | MSU/COM medical student |
| 2019-2020 | Cathy Lee | MSU medical student | Project mentor | MSU/COM medical student |
| 2019-2021 | Christopher Chang | MSU medical student | Project mentor | MSU/COM medical student |
| 2019- | Mengying Sun | CS PhD student(co-supervise with Jiayu Zhou) | Mentor | Data Scientist at Meta (facebook) |
| 2019 summer | Suchir Gupta | High school intern | Mentor | Central High school (later admitted to University of Michigan) |
| 2019-2019 | Yingying Wu | Postdoc scholar | mentor | Postdoc scholar at Harvard |
| 2019-2021 | Shan-Ju Yeh | PhD student | mentor | Visiting PhD student, Taiwan National Tsinghua University |
| 2019- | Eugene Chekalin | Postdoc scholar | mentor | Senior Computational Biologist at Illumina |
| 2020- | Austin Vanvelsen | Medical student at CHM | Mentor | Medical student at CHM |
| 2020- | Tyler Vanvelsen | Medical student at CHM | Mentor | Medical student at CHM |
| 2020 summer | Xiangyu Chen | High school intern | Mentor | East Grand Rapids High School (then admitted to UPenn) |
| 2020 | Raymond Lesiyon | Undergraduate senior | Course mentor | MSU undergraduate |
| 2020- | **Jeremy Haskins** | Lab assistant | Mentor |  |
| 2020- | **Gregory, Burns,** | F32 postdoc fellow in Asgerally Fazleabas Lab | Co-sponsor |  |
| 2020- | **Dimitri Joseph** | DO/PHD student | Mentor |  |
| 2020- | **Ruoqiao Chen** | BMS PhD student | Mentor |  |
| 2021 summer | Jeanne Yang | Undergraduate freshman intern | Mentor | UM undergraduate |
| 2021- | **Spancer Zhou** | Undergraduate senior | Mentor |  |
| 2021 | Jacob Zieba | BMS rotation student | Mentor | BMS student |
| 2021- | **Han Meng** | Research assistant | Mentor |  |

**TRAINEE ACHIEVEMENTS (after moving to MSU)**

**Postdoctoral scholars**

**Ke Liu, PhD** (2018-2020): Dr. Liu was promoted to Research Assistant Professor in 2020, leading the EMR (Electronic Medical Record) big data program between Spectrum Health and MSU. During his training in the lab, he published one first-author paper in *Nature Communications* and submitted three manuscripts (one of them is under review in *Science Advances*). He recently received a faculty offer from Shandong University in China and will be named as **Qilu Scholar**, a prestigious award to attract scholars from abroad. He is expected to **start his independent position** in 2022.

**Patrick Newbury, MD** (2018-2019): Within one year in my lab, Dr. Newbury published two first-author papers (one was **published in *Nature Protocols***). His DIPG (Diffuse Intrinsic Pontine Glioma) work was chosen as one of the six oral presentations from over 50 submissions in the MSU Pediatrics Research Day 2019. He did not match during his medical school, but the one-year training in my lab helped him **get into a competitive radiation oncology program** at the University of Oklahoma (only a couple of CHM students are accepted into a radiation oncology program every year).

**Yingying Wu**, PhD (2019): Dr. Wu went to **Harvard** to continue her PhD training.

**Rama Shankar**, PhD (2018-present): Dr. Shankar’s MODS (Multiple Organ Dysfunction Syndrome) work was chosen as one of the six oral presentations in the MSU Pediatrics Research Day, though the conference was canceled. He presented his work at ICIBM 2019 and the American Association for Cancer Research (AACR) annual meeting. His first author paper was published in the **EBioMedicine (The Lancet)** in 2020. His other two manuscripts (one about liver cell biomarker and another about SARS-CoV-2 drug repurposing) are expected to publish in high-profile journals in 2022. He is preparing for a **K99 application**.

**Jing Xing**, PhD (2018-present): Dr. Xing’s SARS-CoV-2 work was chosen as one of the six oral presentations in the MSU Pediatrics Research Day 2021 and was selected as an oral presentation in the joint conference between Intelligent Systems for Molecular Biology and European Conference on Computational Biology (ISMB/ECCB 2021). The work was subsequently published in **Briefings in Bioinformatics** (IF: 11). She also has two other great co-first manuscripts under submission. Jing has accepted a **PI position at Shanghai Institute of Materia Medica (SIMM), Chinese Academy of Sciences**.

**Eugene Chekalin**, PhD (2019-present): Dr. Chekalin quickly helped publish our OCTAD (Open Cancer TherApeutic Discovery) work in **Nature Protocols** (he was a co-first author) and contributed to two other drug repurposing manuscripts. His own first-author paper on bispecific target discovery is likely to publish in 2021. He plans to go to the industry after the training. **Eugene joined Illumina as a senior computational biologist**.

**PhD students**

**Mengying Sun** (expect to graduate in 2022 spring): Mengying is a Computer Science PhD student, co-advised by me and Prof. Jiayu Zhou. Mengying has published two papers in top computer science conferences (**IEEE International Conference on Data Mining (ICDM): acceptance rate 19%, Knowledge Discovery and Data Mining (KDD): acceptance rate 15%**). Her another co-first manuscript on COVID sex difference analysis is under submission. She received a competitive offer from Facebook.

**Shan-Ju Yeh** (2019-2021): Shan-Ju was a visiting PhD student in Electrical Engineering from Taiwan National Tsinghua University. She will start **a fixed-term assistant professor position at Taiwan National Tsinghua University** in August 2022.

**Dimitri Joseph** (2021-present): Dimitri is a DO/PhD student, co-advised by me and Prof. Alfred Robison. He recently submitted **a diversity R01 supplement** to support his graduate school next year.

**Ruoqiao Chen** (2021-present): As a first year Pharmacology PhD student, she already **co-authored one manuscript** which is under revision.

**Tom Hu** (2018 summer): Tom was an MS student at UC Berkeley, working in my lab as a summer intern. Tom Hu presented his work at the Pacific Symposium on Biocomputing (PSB) annual meeting and **won a travel award**.

**Anita Wen** (2018 summer): Anita was a PhD student at UC Davis, working in my lab as a summer intern. Anita published **one co-author paper**.

**Medical students**

**Billy Zeng** (2018, UCSF/MSU): Billy was my medical student when I was at UCSF, and then working in my lab at MSU in 2018 summer. He published **two first author papers** and co-authored a few others.

**Albert Jiao** (2018, CHM): Albert presented his work on cholangiocarcinoma therapeutic discovery at the MSU Graduate Academic Conference 2019 and joined the competitive radiation oncology residency program at Harvard

**Kasim Fassia** (2018, CHM): Kasim applied Wilbur C. Wright Memorial Scholarshi.

**Rae Felismino, Krista Young, Cathy Lee, Christopher Chang** (2019, COM): Krista and Christopher co-authored one manuscript.

**Austin Vanvelsen, Tyler Vanvelsen** (2020, CHM): Austin and Tyler co-authored one manuscript.

**Undergraduate students\***

Anthony Sciarini (2018, GVSU): summer intern

Keith Schmitt (2018, GVSU): summer intern

Jeanne Yang (2021, UM): summer intern

Raymond Lesiyon (2020, MSU): course mentor

Spancer Zhou (2021-, MSU): project mentor

\*Because my lab is not located in the main campus and many undergraduates cannot drive, the distance imposes challenges to me to mentor undergraduates. During my first year at MSU, I had to find undergraduate/graduate students from local institutes like GVSU.

**High school students**

Suchir Gupta (2019 intern): accepted into University of Michigan

Xiangyu Chen (2020 intern): accepted into University of Pennsylvania

**Others**

**Gregory Burns** (2021): an NIH F32 postdoc fellow in Asgerally Fazleabas Lab, I am a co-sponsor.

**Omar Kana** (2018): BMS rotation student

**Dimitri Joseph** (2020): BMS rotation student, now my PhD student

**Jacob Zieba** (2021): BMS rotation student

\*Each semester, normally one trainee presents lab research in the MSU Cancer Research Network and in the Computational Biology forum.

\*Every trainee staying in the lab over two years publishes at least one high-profile paper.

**RESEARCH AWARDS - CURRENT**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | Global Impact Initiative | | PI | | |  | | | Chen (PI) | |
|  | MSU | | | | | 4/01/2018 | | | 3/31/2023 | |
|  | MSU startup funds |  | | |
| 2. | R01 GM134307 | | | PI | | | 23% effort | Chen (PI) | | |
|  | NIH/NIGMS | | | | | | 09/01/2019 | 07/30/2024 | | |
|  | Repurpose open data to discover new therapeutics for understudied diseases | | | | | | $300,000 direct/year |  | | |
| 3. | Spectrum Health-MSU Alliance | | | PI | | | 1% | Chen (PI) | | |
|  | Spectrum Health-MSU Alliance Cooperation | | | | | | 07/01/2019 | 06/30/2023 | | |
|  | Spectrum Health-MSU Big Data Collaborative Program | | | | | | $867,744 total |  | | |
|  |  | | | | | | | | | |
| 4. | Spectrum Health-MSU Alliance | | | Co-I | | | 1% | Prokop, Hartog (PI) | | |
|  | Spectrum Health-MSU Alliance Cooperation | | | | | | 3/1/2021 | 8/31/2022 | | |
|  | Acute and chronic immune precision medicine program at Spectrum Health centered on COVID-  19 | | | | | |  |  | | |
|  | Assist bioinformatics analysis of RNASeq samples | | | | | | | | | |
| 5. | Spectrum Health-MSU Alliance | | | Co-I | | | 1% | Girgis, Li, Uhal, Neubig (PI) | | |
|  | Spectrum Health-MSU Alliance Cooperation | | | | | | 10/01/2021 | 3/31/2023 | | |
|  | Pilot Studies for Fibrosing Lung Disease Therapeutics Center of Excellence | | | | | | 10% to one technician |  | | |
|  | Assist bioinformatics analysis of bulk and single cell RNASeq samples | | | | | | | | | |
| 6. | HFH-MSU pilot | | | MPI | | | 1% | Chen, Ghosh (PI) | | |
|  | Henry Ford Health – MSU joint cancer pilot | | | | | | 7/01/2022 | 6/30/2023 | | |
|  | Development of novel small molecule inhibitors of Tribbles 2 using artificial intelligence | | | | | | $8000 |  | | |
|  | Assist bioinformatics analysis of bulk and single cell RNASeq samples | | | | | | | | | |
| 7. | R01 Supplement | | PI | | | 1% effort | | | Chen (PI) |
|  | NIGMS Diversity Supplement Program for the active R01 GM134307 | | | | | 12/01/2021 | | | 8/30/2022  $57,000 |
| 8. | R01 | | MPI(Lead) | | | 15% effort | | | Chen, Zhou (PI) |
|  | NIGMS  Virtual compound screening using gene expression  Develop ML to support novel compound discovery for a range of diseases | | | | | 6/01/2022  $420,807/year | | | 5/30/2026 |
| 9. | R03 | | Co-I | | | 1% effort | | | Lee (PI) |
|  | NIH/NIA  Oxylipins, aging and Alzheimer's disease | | | | | 06/15/2022  10% to a technician | | | 03/31/2024 |
|  |

**RESEARCH AWARDS – PENDING (only as MSU PI)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. | HFH-MSU integration grant | MPI |  | Chen, Zhou (PI) |
|  | Translating γδ2 T cells into a new immunotherapy target in liver cancer | | 7/01/2022 | 6/30/2023  $100K direct/year |
| 2. | NIH R01 | Co-I |  | Li (PI) |
|  | Effect of enzalutamide on prostate cancer dormancy in bones | | 06/01/2023 | 05/31/2028 |
| 3. | NIH R01 | Co-I |  | Fazleabas (PI) |
|  | Transcriptomic changes during Early Endometriotic Lesion Development | | 12/01/2022 | 11/30/2027 |
| 4. | Alexs Lemonade Stand Foundation | MPI | 10% effort | Chen, Hashizume  (PI) |
|  | Hunting candidates for Diffuse Intrinsic Pontine Glioma from billions of compounds through an AI approach | | 02/01/2023 | 01/31/2027  $200K direct/year |
| 5. | NIH R01 | Co-I |  | Li (PI) |
|  | Targeting a non-gastric proton pump, ATP12A, for idiopathic pulmonary fibrosis treatment | | 12/01/2022 | 11/30/2027 |
| 6. | Spectrum-MSU alliance | MPI |  | Chen, Loyaga Rendon (PI) |
|  | Delineating cellular and molecular manifestation for ICU cardiogenic shock patients through single cell omics and machine learning | | 2/01/2023 | 7/31/2024  $200K in total |

**RESEARCH AWARDS - PAST**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | Stanford SPARK program | | | co-investigator | | | | | | | | | | | | | 0 % effort | | | | | | | | So (PI) | | |
|  | Stanford SPARK | | | | | | | | | | | | | | | | 01/01/2016 | | | | | | | | 12/31/2016 | | |
|  | Translating niclosamide ethanolamine for the treatment of hepatocellular carcinoma | | | | | | | | | | | | | | | | $ 30,000 direct/yr 1 | | | | | | | | $ 30,000 total | | |
|  | Conduct PK/PD/Toxicity study on niclosamide ethanolamine in animal models | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | I coordinated this project and did not draw the salary from this grant. This grant was primarily used for experimental validation. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | P01 PAR-13-321 | | | | | | | | | co-investigator | | | | | | | | | 5 % effort | | | | | | | | Esserman & Hylton (PI) |
|  | NIH/NCI | | | | | | | | | | | | | | | | | | 07/01/2017 | | | | | | | | 3/31/2018 |
|  | I-SPY2 +: Evolving the I-SPY 2 TRIAL to include MRI-directed, adaptive sequential treatment to optimize breast cancer outcomes | | | | | | | | | | | | | | | | | | $ 1,849,707 direct/yr 1 | | | | | | | | $ 8,531,879 total |
|  | Develop, implement, and validate a strategy to address insufficient response to neoadjuvant therapy in high-risk breast cancer  Lead the effort to develop a portfolio of agents for switching that match biology of residual tumor burden (Project 4)  Project terminated due to career move | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | L’Oreal & UCSF collaboration | | | | | | | | co- investigator | | | | | | | | | 5 % effort | | | | | | | | Butte (PI) | |
|  | L’Oreal & UCSF collaboration | | | | | | | | | | | | | | | | | 07/01/2017 | | | | | | | | 3/31/2018 | |
|  | Leveraging big data to predict new targets and actives for hyper pigmentation | | | | | | | | | | | | | | | | |  | | | | | | | | $ 499,374 total | |
|  | Develop a computational method to identify new drugs for hyper pigmentation | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | Lead the effort on drug predictions  Project terminated due to career move | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | U24DK116215 | | | | co-investigator | | | | | | | | 5 % effort | | | | | | | | | | | McManus & Jan (PI) | | | |
|  | NIH/NIDDK | | | | | | | | | | | | 11/01/2017 | | | | | | | | | | | 3/31/2018 | | | |
|  | Illuminating the Dark Kinome | | | | | | | | | | | | $ 1,600,000 direct/yr 1 | | | | | | | | | | |  | | | |
|  | Facilitate the unveiling of functions of poorly characterized members of the human kinome using experimental and informatics approaches.  Informatics core lead  Project terminated due to career move | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. | R21TR001743 | | PI | | | | | | | | | 10 % effort | | | | | | | | | | | Chen (PI) | | | | |
|  | NIH/ NCATS | | | | | | | | | | | 8/01/2017 | | | | | | | | | | | 7/31/2019 | | | | |
|  | Targeting Glucose Metabolism for the Treatment of Hepatocellular Carcinoma | | | | | | | | | | | $216,349 direct/yr 1 | | | | | | | | | | |  | | | | |
|  | The goal of this project is to validate the efficacy of a few drug candidates that target glucose metabolism for the treatment of hepatocellular carcinoma in preclinical models. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. | Amazon AWS Research Credit | | | | | | | PI | | | | | | |  | | | | | | Chen (PI) | | | | | | |
|  | Amazon | | | | | | | | | | | | | | 04/19/2019 | | | | | | 04/19/2019 | | | | | | |
|  | Cloud research credit to develop OCTAD | | | | | | | | | | | | | | $ 1,500  direct | | | | | |  | | | | | | |
| 7. | 1OT2TR003426-01 | | | | | | PI | | | | | | |  | | | | | | Chen (PI) | | | | | | | |
|  | NIH/NCATS | | | | | | | | | | | | | 01/24/2020 | | | | | | 05/31/2020 | | | | | | | |
|  | Drug biomarker resources for precise translational research | | | | | | | | | | | | | $ 87,195  direct | | | | | |  | | | | | | | |
|  | Create drug biomarker resources from public databases | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. | Henlius | PI | | | | | | | | |  | | | | | | | | | | | Chen (PI) | | | | | | |
|  | Industry-sponsored | | | | | | | | | | 5/01/2019 | | | | | | | | | | | 4/30/2021 (no cost extension to 11/30/2021) | | | | | | |
|  | Big data approach to identify next generation immuno-oncology targets | | | | | | | | | | $124,000 direct/yr 1 | | | | | | | | | | |  | | | | | | |
|  | This collaborative proposal is aimed to propose novel targets to increase immunotherapy response. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. | FAIN2028717 | | | | | Co-PI | | | | | | | | |  | | | | | Ding (PI) | | | | | | | | | |
|  | NSF | | | | | | | | | | | | | | 07/01/2020 | | | | | 12/31/2021 | | | | | | | | | |
|  | RAPID: Dashboard for COVID-19 Scientific Development | | | | | | | | | | | | | | $ 50,000 (chen lab)  direct | | | | |  | | | | | | | | | |
|  | Develop a dashboard for COVID-19 research. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. | BD2K K01 ES028047 | | | | | PI | | | | | | | | | | 50 % effort | | | | Chen (PI) | | | | | | | | | | |
|  | NIH/NIEHS | | | | | | | | | | | | | | | 05/01/2017 | | | | 04/30/2021 (no cost extension to 04/30/2022 | | | | | | | | | | |
|  | Integrating transcriptomic, proteomic and pharmacogenomic data to inform individualized therapy in cancers | | | | | | | | | | | | | | | $ 171,216 direct/yr 1 | | | | $ 684,864 total | | | | | | | | | | |
|  | Develop biomarkers from cell lines to guide cancer therapy | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**PEER REVIEWED PUBLICATIONS (\* co-corresponding, # co-first)**

[**https://scholar.google.com/citations?user=K7MBJlwAAAAJ&hl=en**](https://scholar.google.com/citations?user=K7MBJlwAAAAJ&hl=en)

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3. **Chen B**, Wild D, Guha R. PubChem Bioassays as a Source of Polypharmacology, J Chem Inf Model., 2009, 49(9), 2044-55
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20. Fan-Minogue H#, **Chen B**#, Sikora-Wohlfeld W, Sirota M, Butte AJ. A systematic assessment of linking gene expression with genetic variants for prioritizing candidate targets. Pacific Symposium on Biocomputing (PSB) 2015, Hawaii
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**Press**

\*Deworming Pill May Be Effective in Treating Liver Cancer (UCSF press release)

\*Bioinformatic Search Identifies Tapeworm Drug for Treatment of Hepatocellular Carcinoma (Featured in Gastro journal)

\*New Approach to Drug Discovery Finds Veterinary Pill Helps Mice Fight Liver Cancer (LIVER DISEASE NEWS)

\*Featured in the UCSF Magazine Winter 2018 and the UCSF Cancer Year in Review: 2017

1. **Chen B**\*#, Ma L#, Paik H, Sirota M, So S, Chua MS\*, Butte AJ\*. Reversal of cancer gene expression correlates with drug efficacy and suggests therapeutic targets, Nat Commun. 2017 Jul 12; 8:16022. PMID: 28699633.

**Press**

\*Big-Data Analysis Points Toward New Drug Discovery Method (UCSF press release, Science Daily, EurekAlert )

\*Database sleuths turn up a surprising new drug to test against cancer (STAT)

\*Systems Study Taps Cancer Gene Expression Reversal to Predict Drug Response (genomeweb)

\*How Big Data Is Transforming Medicine (HuffPost)

\*New Computational Method to Aid Cancer Drug Discovery (Genetic Engineering & Biotechnology News)

\*UCSF-led research produces method for probing new drug use (XINHUA)

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6. William Zeng, Benjamin Glicksberg, Yangyan Li, **Bin Chen,** Selecting precise reference normal tissue samples for cancer research using a deep learning approach, BMC Med Genomics. 2019 Jan 31;12(Suppl 1):21. doi: 10.1186/s12920-018-0463-6. PMID: 30704474
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9. **Bin Chen\***, Lana Garmire, Diego F. Calvisi, Mei-Sze Chua, Xin Chen, Harnessing big omics data and artificial intelligence to guide therapeutic discovery in hepatocellular carcinoma. Nature Reviews Gastroenterology and Hepatology; doi: 10.1038/s41575-019-0240-9. PMID: 31900465 (IF 30)

**Press**

\*Big data targets deadly liver cancer (MSU Today)

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**Press**

\*Big data helps identify better way to research breast cancer’s spread (MSU press release, Science Daily, EurekAlert )

\*Breast Cancer Cell Lines Get Big Data Assistance (GEN News)

\*Are Cell Lines the Best Model to Analyze Breast Cancer Biology? (I3Health News)

\*Big data helps determine better research models to fight the spread of breast cancer (The Medical News)

\*Using Big Data to Improve Metastatic Breast Cancer Research (Specialty Pharmacy Times)

\*Tweeted by NCI Genomices, NatRevClinOncol and many others

\*Select as an NIEHS Extramural Paper of the Month

1. K. Yu, **B. Chen**, D. Aran, J. Charalel, C. Yau, D. M. Wolf, L. J. van ‘t Veer, A. J. Butte, T. Goldstein & M. Sirota, Comprehensive transcriptomic analysis of cell lines as models of primary tumors across 22 tumor types, Nature Communications, volume 10, Article number: 3574 (2019). PMID:31395879
2. McMahon M, Contreras A, Holm M, Uechi T, Forester CM, Pang X, Jackson C, Calvert ME, **Chen B**, Quigley DA, Luk JM, Kelley RK, Gordan JD, Gill RM, Blanchard SC, Ruggero D. A single H/ACA small nucleolar RNA mediates tumor suppression downstream of oncogenic RAS. Elife. 2019 Sep 3;8. pii: e48847. doi: 10.7554/eLife.48847. PMID: 31478838
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5. Jeremy W Prokop, Rama Shankar, Ruchir Gupta, Mara L Leimanis, Derek Nedveck, Katie Uhl, **Bin Chen**, Nicholas L Hartog, Jason Van Veen, Joshua S Sisco, Olivia Sirpilla, Todd Lydic, Brian Boville, Angel Hernandez, Chi Braunreiter, ChiuYing Cynthia Kuk, Varinder Singh, Joshua Mills, Marc Wegener, Marie Adams, Mary Rhodes, Andre S Bachmann, Wenjing Pan, Miranda L Byrne-Steele, D Casey Smith, Mollye Depinet, Brittany E Brown, Mary Eisenhower, Jian Han, Marcus Haw, Casey Madura, Dominic J Sanfilippo, Laurie H Seaver, Caleb Bupp, Surender Rajasekaran, Translational and Precision Medicine: Virus-induced genetics revealed by multidimensional precision medicine transcriptional workflow applicable to COVID-19, Physiol Genomics. 2020 Jun 1; 52(6): 255–268, PMID: 32437232
6. Billy Zeng#, Benjamin S. Glicksberg#, Patrick Newbury#, Eugene Chekalin#, Jing Xing, Ke Liu, Anita Wen, Caven Chow, **Bin Chen**, OCTAD: an open workplace for virtually screening therapeutics targeting precise cancer patient groups using gene expression features, Accepted, Nature Protocols, 2020 Dec 23. doi: 10.1038/s41596-020-00430-z. PMID:33361798

**Press**

\*BioArt, a leading biomedical media based on WeChat platform in China with more than 500 thousand followers.

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2. Zhou G, Holzman C, **Chen B**, Wang P, Heng YJ, Kibschull M, Lye SJ, Kasten EP. EBF1-correlated long non-coding RNA transcript levels in 3rd trimester maternal blood and risk of spontaneous preterm birth. Reproductive Sciences. 2020; PMID: 32959224. DOI: 10.1007/s43032-020-00320-5.
3. Rama Shankar, Mara L. Leimanis, Patrick A. Newbury, Ke Liu, Jing Xing, Derek Nedveck, Eric J. Kort, Jeremy W Prokop, Guoli Zhou, André S Bachmann, **Bin Chen**\*, Surender Rajasekaran\*, Gene expression signatures identify pediatric patients with multiple organ dysfunction who require advanced life support in the intensive care unit EBioMedicine (The Lancet), 2020 Dec;62:103122. doi: 10.1016/j.ebiom.2020.103122. Epub 2020 Nov 25.
4. Wyatt Boothby-Shoemaker, Vanessa Benham, Shreya Paithankar, Rama Shankar, **Bin Chen**, Jamie J Bernard, The Relationship between Leptin, the Leptin Receptor and FGFR1 in Primary Human Breast Tumors, Cells. 2020 Oct 1;9(10):2224. doi: 10.3390/cells9102224.
5. Calvin Chi, Yuting Ye, **Bin Chen**, Haiyan Huang, Bipartite graph-based approach for clustering of cell lines by gene expression-drug response associations, Bioinformatics, PMID: 33682877 DOI: 10.1093/bioinformatics/btab143
6. Mengying Sun, Jing Xing, Huijun Wang, **Bin Chen**, Jiayu Zhou, MoCL: Contrastive Learning on Molecular Graphs with Multi-level Domain Knowledge, KDD, 2021, <https://arxiv.org/abs/2106.04509> (acceptance rate 15.4%)
7. Jing Xing, Shreya Paithankar, Ke Liu, Katie Uhl, Xiaopeng Li, Meehyun Ko, Seungtaek Kim, Jeremy Haskins, **Bin Chen**\* Published Anti-SARS-CoV-2 In Vitro Hits Share Common Mechanisms of Action that Synergize with Antivirals, Briefings in Bioinformatics (IF=11), 2021, PMID: 34245241 DOI: 10.1093/bib/bbab249

**Press**

\* COVID-19 researchers review 184 drug repurposing candidates (news-medical)

1. Jeremy W Prokop, Nicholas Hartog, Dave Chesla, William Faber, Chanise P Love, Rachid Karam, Nelly Abualkheir, Benjamin Feldmann, Li Teng, Tamara Mcbride, Mara L Leimanis Laurens, B Keith English, Amanda R Holsworth, Austin Frisch, Jacob Bauss, Nathisha Kalpage, Aram Derbedrossian, Ryan M Pinti, Nicole Hale, Elizabeth A Vansickle, Spencer C Pageau, Rama Shankar, **Bin Chen**, Joseph Anthony Carcillo, Dominic Sanfilippo, Rosemary Olivero, Caleb P Bupp, Surender Rajasekaran, High-Density Blood Transcriptomics Reveals Precision Immune Signatures of SARS-CoV-2 Infection in Hospitalized Individuals, Frontiers in Immunology, 2021, PMID: 34335605 <https://doi.org/10.3389/fimmu.2021.694243>
2. Alice Taubes , Phil Nova , Kelly Zalocusky , Dr Idit Kosti , Mesude Bicak , Dr Misha Zilberter , Yanxia Hao , Ms Seo Yoon , Tomiko Oskotsky , Silvia Pineda , Professor **Bin Chen** , Emily Jones , Dr Krishna Choudhary , Dr Brian Grone , Maureen Balestra , Fayzan Chaudhry , Ishan Paranjpe , Jessica De Freitas , Ms Nicole Koutsodendris , Dr Qin Xu , Mr David Walker , William Chang , Alice An , Professor Benjamin Glicksberg , Dr Marina Sirota, Dr Yadong Huang, Experimental and real world evidence supporting the computational repurposing of bumetanide to prevent or treat APOE4-related Alzheimer’s disease, Nature Aging, 1, 932–947 (2021). https://doi.org/10.1038/s43587-021-00122-7
3. Sean A Misek, Patrick A Newbury, Evgenii Chekalin, Shreya Paithankar, Andrea I Doseff, **Bin Chen**\*, Kathleen A Gallo\*, Richard R Neubig\*, Ibrutinib blocks YAP1 activation and reverses BRAFi resistance in melanoma cells, Molecular Pharmacology, PMID: 34732527, 2022, DOI: 10.1124/molpharm.121.000331
4. Shang Su, Jingchen Cao, Xiangqi Meng, Ruihua Liu, Alexandra Vander Ark, Erica Woodford, Reian Zhang, Isabelle Stiver, Xiaotun Zhang, Zachary B Madaj, Megan J Bowman, Yingying Wu, H Eric Xu, **Bin Chen**, Haiquan Yu, Xiaohong Li, Enzalutamide-induced and PTH1R-mediated TGFBR2 degradation in osteoblasts confers resistance in prostate cancer bone metastases, Cancer Letters, 2022, PMID: 34752846 DOI: 10.1016/j.canlet.2021.10.042
5. Jacob Bauss, Michele Morris, Rama Shankar, Rosemary Olivero, Leah N Buck, Cynthia L Stenger, David Hinds, Joshua Mills, Alexandra Eby, Joseph W Zagorski, Caitlin Smith, Sara Guenthner Cline, Nicholas Hartog, **Bin Chen**, John Huss, Joseph Anthony Carcillo, Surender Rajasekaran, Caleb Bupp, Jeremy W Prokop, CCR5 and biological complexity: the need for data integration and educational materials to address genetic/biological reductionism at the interface of Ethical, Legal, and Social Implications, Frontiers in Immunology, 2021, PMID: 34925370 PMCID: PMC8674737 DOI: 10.3389/fimmu.2021.790041
6. Ke Liu#, Omkar Kulkarni#,, Martin Witteveen-Lane, **Bin Chen**\*, Dave Chesla\*, MetBERT: a generalizable and pre-trained deep learning model for the prediction of metastatic cancer from clinical notes, AMIA Annu Symp Proc . 2022 May 23;2022:331-338. PMID: 35854741
7. Mengying Sun, Jing Xing, Han Meng, Huijun Wang, **Bin Chen**, Jiayu Zhou, MolSearch: Search-based Multi-objective Molecular Generation and Property Optimization. KDD Health Day 2022 (Best Paper Award)
8. Jing Xing,#, Rama Shankar,#, Meehyun Ko,#, Keke Zhang, Sulin Zhang, Aleksandra Drelich, Shreya Paithankar, Eugene Chekalin, Mei-Sze Chua, Surender Rajasekaran, Chien-Te Kent Tseng, Mingyue Zheng, Seungtaek Kim\*, Bin Chen\*, Deciphering COVID-19 host transcriptomic complexity and variations for therapeutic discovery against new variants, iScience (Cell publishing group), accepted in principle
9. Guisheng Zhao#, Patrick Newbury#, Yukitomo Ishi#, Eugene Chekalin, William Zeng, Benjamin S. Glicksberg, Anita Wen, Shreya Paithakar, Takahiro Sasaki, Amreena Suri, Javad Nazarian, Michael E. Pacold, Theodore Nicolaides, Bin Chen\*, Rintaro Hashizume\*, Reversal of Cancer Gene Expression Identifies Repurposed Drugs for Diffuse Intrinsic Pontine Glioma, Acta Neuropathologica Communications (minor revision)

**Submitted/Preprint (as a key contributor)**

1. Rama Shankar, Mingdian Tan, Jeremy Haskins, Shreya Paithankar, Samuel So, Mei-Sze Chuaand **Bin Chen**\*, Pan-liver disease single cell-based deconvolution reveals γδ2 T cells as a marker in hepatocellular carcinoma development**,** under submission (*Nature* editor expressed interest)

Hepatocellular carcinoma (HCC) morbidity is highest in individuals with chronic liver diseases (CLD); however, effects of cell composition on the progression of CLDs to HCC remains unknown. Gene biomarkers of twenty cell types from healthy liver were used for cell type enrichment in six CLDs and HCC. Compared to the healthy state, liver fibrosis and HCC present higher enrichment of γδ2 T cells and lower enrichment of central venous liver sinusoidal endothelial cells (LSECs). High enrichment of γδ2 T cells was specifically observed in HCC with underlying chronic hepatitis B or C virus (HBV or HCV) infections, as well as in advanced HCC and confirmed with scRNA-seq. The enrichment of γδ2 T cells is associated with poor prognosis for HCC with high alpha-fetoprotein (AFP) and underlying HBV and/or HCV infection. Additionally, enrichment of γδ2 T cells in blood samples of CLDs and HCC, indicating their potential as a diagnostic marker.

1. Jing Xing#, Rama Shankar#, Aleksandra Drelich#, Shreya Paithankar, Eugene Chekalin, Thomas Dexheimer, Surender Rajasekaran, Chien-Te Kent Tseng\*, **Bin Chen**\*, Reversal of Infected Host Gene Expression Identifies Repurposed Drug Candidates for COVID-19, PMID:32511305, PMC7217282,

**Press**

\* New process to identify existing drugs for potential COVID-19 treatments (MSU today)

\* MSU scientist testing existing drugs to fight COVID-19 (wlns)

\* Researchers at East Lansing’s MSU Use Computational Process to Find Existing Drugs to Treat COVID-19 (dbusiness)

1. Ke Liu\*, Mingdian Tan, Benjamin S. Glicksberg, Shreya Paithankar, Samuel So, Mei-Sze Chua, **Bin Chen**, Deciphering cancer metastasis with pan-cancer transcriptomic comparison, under review

We conduct transcriptomic comparisons in seven cancer types to decipher the complexity of liver metastases. We first develop DEBoost to identify differentially expressed (DE) genes between metastatic and primary cancer cells. The following functional analysis suggests that liver metastases of prostate cancer and pancreatic neuroendocrine tumor are more active in cell cycling than their respective primary cancers whereas other cancer types not. The expressions of DE genes have limited associations with clinical measures, indicating most of them may be passenger DE genes of the metastasis process. We cluster DE genes based on their chromosome coordinates to uncover copy number differences and further confirm 19p13.12 amplification drives metastasis in Basal-like breast cancer. Finally, we show that metastatic cancer cells could partially mimic the secretome of hepatocytes by selectively expressing liver-specific genes encoding secreted proteins. Our work provides a novel framework to study cancer metastasis using pan-cancer transcriptomic data.

1. Shan-Ju Yeh, Jing Xing, Mengying Sun, Ke Liu, Shreya Paithankar, Jiayu Zhou, **Bin Chen**\* In silico expanding of molecular measures from gene expressions through transfer learning**,** under review NAR Genomics and Bioinformatics

Gene expression profiling of cancer cell lines becomes routine today; however, obtaining comprehensive molecular characterization and cellular responses for a new cell line is not trivial when resources are very limited. Here, we present TransCell, a deep transfer learning framework that utilizes the knowledge derived from pan-cancer tumor samples to predict molecular features and responses. Compared to the five state-of-art methods, TransCell has the best performance in the prediction of complicated tasks: metabolite (Spearman: 0.74), gene effect score (or gene dependency, Spearman: 0.69), and drug sensitivity (Spearman: 0.65), and has comparable performance in the prediction of easy tasks: mutation (AUC: 0.86), copy number variation (Spearman: 0.81) and protein expression (Spearman: 0.74). TransCell improved the performance by over 50% in drug sensitivity prediction and was further applied to expand the drug sensitivity of 101 pediatric cancer cell lines. This study demonstrates the potential of in-silico expansion of measures from the easily accessible gene expression.

1. Mengying Sun, Jing Xing, Huijun Wang, Bin Chen, Jiayu Zhou, MoCL: Contrastive Learning on Molecular Graphs with Multi-level Domain Knowledge Mengying Sun, Christopher Daniel Chang#, Shan-Ju Yeh#, Shilong Li, Ke Liu, Guoli Zhou, Rama Shankar, Jing Xing, Austin VanVelsen, Tyler VanVelsen, Benjamin Y. Feng, Krista Young, Michael Strug, Lauren Turco, Zichen Wang, Eric Schadt, Rong Chen, Xiaohong Li, Li Li, Jiayu Zhou, **Bin Chen**\* Analysis of 220,000 human transcriptome samples reveals that differential expression of virus entry proteins is associated with sex differences in COVID-19, under submission, PMC765487

**NON-PEER REVIEWED PUBLICATIONS**

1. **Chen B**., Wang H., Ding Y., Wild D., Semantic Breakthrough in Drug Discovery, Morgan & Claypool Publishers, 2014 (Book)
2. Sirota M., **Chen B**. Translational Bioinformatics in Drug Discovery, ACM's student magazine XRDS, The ACM Magazine for Students 21 (4), 28-33
3. **Chen B**. Ten Simple Rules for Internship in a Pharmaceutical Company. PLoS computational biology. 2014;10(5):e1003600.