**Dianyi Liu**

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# Highlights

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| A curious researcher in Plant Science.  A talented bench worker that designs and conducts sophisticated experiments.  A passionate pop science translator that brings the world's ideas and knowledge into Mandarin Chinese.  A fun chaser enjoying dancing, bodybuilding, painting, and learning languages for the quality of life. |

# Techniques and Specializations

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| **Specialization**  Genetics, Cell Biology, Molecular Biology, Microscopy, Microbial Biology, Plant Biology  Cell Size Control, Mitosis, Multiple Fission  Chlamydomonas, Volvocine Algae, Cell Synchronization, Retinoblastoma Tumor Suppressor Pathway  **Languages**  **Mandarin Chinese** - Native Language  **English** - Professional Working Language  **Japanese** – Intermediate/Advanced Level - Japanese Language Proficiency Test, Level 2 **(日本語能力試験N2)**  **Statistics and Data Analysis**  **R Programming** for data joining and data manipulation including statistics fundamentals (data analysis, correlation, regression, and inference) and data visualization (using packages ggplot2, base R, and lattice) |

# Education

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| **University of Missouri,** St. Louis. MO  Ph.D. Candidate in Cell and Molecular Biology | 2015.8 - Present  **GPA 4.0/4.0** |
| **Washington University,** St. Louis, MO  M.S.in Plant and Microbial Biology | 2012.8 - 2015.5 |
| **Stony Brook University**, Stony Brook, NY  B.S. in Biology, Developmental Genetics Specialization  **Graduated with Honors** in Biology  **Irwin Oster Award**, Excellence in Genetics Research  **Outstanding Undergraduate Achievement**, Developmental Genetics Specialization | 2010.8 - 2012.5 |
| **Nanjing University**, Nanjing, Jiangsu, China  B.S. in Biology  **National Scholarship**, Tier 1, Year of 2010  **National Scholarship**, Tier 2, Year of 2009 | 2008.9 - 2010.6 |

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# Research Experience

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| Graduate Thesis Research | 2012.8 - Present | |
| Dr. James Umen's lab. Donald Danforth Plant Science Center  Thesis: Elucidating the cell size control mechanism in *Chlamydomonas reinhardtii.* | | |
| * Used a data-mining strategy to identify highly expressed genes in Chlamydomonas whose flanking sequences were tested for the ability to drive heterologous nuclear transgene expression. | | |
| * Identified a sizer protein, CDKG1, that acts through the retinoblastoma tumor suppressor pathway as a D-cyclin-dependent RB kinase to regulate mitotic counting in Chlamydomonas. * Characterized a sizer protein TNY1, which modulates cell-size homeostasis through cell-cycle-controlled synthesis and dosage-dependent repression of the size activator CDKG1. | | |
| * Measured the nuclear:cell volume ratio in wild-type Chlamydomonas and size mutants throughout the multiple fission cell cycle using fluorescence microscopy. * Established stochastic models for growth and division to elucidate the functions of both commitment and mitotic sizers in the size homeostasis of Chlamydomonas. | | |
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| Undergraduate Research | | 2010.9 - 2012.5 | |
| **Dr. Vitaly Citovsky's lab**. Dept. of Biochemistry and Molecular Biology, **Stony Brook University**  **Thesis: Improve the transgene efficiency in *Lemnaceae lemna gibba.*** | | | |
| * Compared pathogenic interactions between agrobacterium and *E.coli* on *Solanum lycopersicum.* | | | |
| * Improved transgene method on *Lemnaceae* (increased transgene efficiency from 20% to 80%), based on floral dip method on *Arabidopsis thaliana* (Cooperated with **Dr. Jörg Schwender’s lab** at **Brookhaven National Laboratory**, NY). | | | |

# Manuscripts

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| Scientific Journal Articles |
| [1] (In prepration for *Current Biology*) Liu, D., García, C., Singh A., and Umen, J.G. Stochastic hybrid system approach to elucidate a cellular counting and sizing mechanism in Chlamydomonas. |
| [2] (In prepration for the *Plant Cell*) Liu, D., Lopez-Paz, C., Li, Y., and Umen, J.G. A heterogeneous nuclear ribonucleoprotein (hnRNP)-like protein in Chlamydomonas functions as a cell-cycle repressor in the retinoblastoma cell-size control pathway. |
| [3] (In prepration for *Plos One*) Liu, D. and Umen, J.G. Testing the constancy of the nuclear: cell volume ratio in Chlamydomonas. |
| [4] Lopez-Paz, C.\*, **Liu, D.\*,** Geng, S., and Umen, J.G. (2017). Identification of Chlamydomonas reinhardtii endogenous genic flanking sequences for improved transgene expression. ***The Plant Journal****: for cell and molecular biology* 92, 1232-1244. (\*co-first author) |
| [5] Li, Y.\*, **Liu, D.\*,** Lopez-Paz, C., Olson, B.J., and Umen, J.G. (2016). A new class of cyclin dependent kinase in Chlamydomonas is required for coupling cell size to cell division. ***eLife***5:e10767 (\*co-first author) |
| [6] (Review) Yu, Y., You, L., **Liu, D.,** Hollinshead, W., Tang, Y.J., and Zhang, F. (2013). Development of Synechocystis sp. PCC 6803 as a phototrophic cell factory. ***Marine drugs*** 11, 2894-2916. |
| Sourcebook Chapter   |  |  | | --- | --- | | [1] ***The Chlamydomonas Sourcebook*, 3rd Edition**  Volumes 1 - Introduction to Chlamydomonas and Its Laboratory Use  Chapter 6 - Cell Cyle and Circadian Rhythm  James Umen and **Dianyi Liu** | 2022,**Elsevier** | |
| Published Translations of Books   |  |  | | --- | --- | | [1] ***Happier at Home*, Chinese Edition** 《幸福断舍离》  ISBN-9787508685977 | July 2018,  **CITIC Publishing Group**  中信出版集团 | | The book is a mandarin Chinese Edition translated by me from Gretchen Rubin's *New York Times* best-seller *Happier at Home.* | | | [2] ***Ten Billion Tomorrows*, Chinese Edition** 《100亿个明天》  ISBN-9787508675886 | Jun 2017, **CITIC Publishing Group**  中信出版集团 | | The book is a mandarin Chinese Edition translated by me from Brian Clegg's science fiction *Ten Billion Tomorrows: How Science Fiction Technology Became Reality and Shapes the Future.* | | |
| Peer Review Experiences  |  | | --- | | * **Independent Peer Review**: *Journal of Evolutionary Biology, PeerJ* | | * **Facilitated Peer Review**: *Science, The Plant Cell, Plos Genetics, Proceedings of the National Academy of Sciences* | |

# Selected Conference Presentations & awards

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| **2021** American Society for Cell Biology **(ASCB)** and European Molecular Biology Organization **(EMBO) Workshop on Cell Size and Growth Regulation** | | 2021.6 |
| **Speaker** by the ASCB/EMBO Workshop Program Committee(talk [1])  [1] Talk: **Liu, D.,** Vargas-García, C., Singh, A., and Umen, J.G. Elucidating the mitotic sizer in the multiple fission alga *Chlamydomonas reinhardtii* | |
| **The 2020 joint meeting of** the American Society for Cell Biology (**ASCB**) **and** European Molecular Biology Organization (**EMBO**) vitual meeting | | 2020.12 |
| [2] Poster and video presentation: **Liu, D**., Lopez-Paz, C., and Umen, J.G. A heterogeneous nuclear ribonucleoprotein (hnRNP)-like protein in Chlamydomonas functions as a cell-cycle repressor in the retinoblastoma cell-size control pathway | |
| [3] Poster and video presentation: **Liu, D.**, Vargas-García, C., Singh, A., and Umen, J. G. Elucidating the mitotic sizer in the multiple fission alga *Chlamydomonas reinhardtii* | |
| **The Plant Cell Atlas**, Carnegie Institution for Science, Stanford, CA | | 2020.5 |
| **Travel Award** by the **Plant Cell Atlas** for the in-person workshops  **Scribe** for all the virtual sessions  **Consortium Author** for the report of the 1st Plant Cell Atlas Workshop | |
| **The 2019 joint meeting of** the American Society for Cell Biology (**ASCB**) **and** European Molecular Biology Organization (**EMBO**), Washington DC | | 2019.12 |
| Participant of **Green Fluorescent Protein Image and Video Contest** - “Hatchlings,” fearturing the whole *in vivo* hatching process of *Chlamydomonas reinhardtii* by a ZEISS Elyra 7 with Apotome super-resolution microscopy in 3D Leap-Mode. | |
| [4] Poster: **Liu, D**., Lopez-Paz, C., and Umen, J.G. A heterogeneous nuclear ribonucleoprotein (hnRNP)-like protein in Chlamydomonas functions as a cell-cycle repressor in the retinoblastoma cell-size control pathway | |
| [5] Poster: **Liu, D.**, Vargas-García, C., Singh, A., and Umen, J. G. Modeling stochastic behavior of size control in the multiple fission cell cycle of Chlamydomonas | |

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| **ASPB** (American Society of Plant Biologists) **Plant Biology 2019**, San Jose, CA | | | | 2019.8 | |
| **ASPB Travel Grant** by **ASPB Plant Biology 2019** | | | |
| **Concurrent Symposium Speaker** by the ASPB Program Committee(talk [6]) | | | |
| [6] Talk: **Liu, D**., Lopez-Paz, C., and Umen, J.G. A heterogeneous nuclear ribonucleoprotein (hnRNP)-like protein in Chlamydomonas functions as a cell-cycle repressor in the retinoblastoma cell-size control pathway | | | |
| [7] Poster: **Liu, D.** and Umen, J.G. Testing the constancy of the nuclear: cell volume ratio in wild type and cell-size mutants of Chlamydomonas.  [8] Poster: **Liu, D.** and Umen, J.G. Stochastic hybrid system approach to elucidate a cellular counting and sizing mechanism in Chlamydomonas.  [9] Poster: **Liu, D**., Lopez-Paz, C., and Umen, J.G. A heterogeneous nuclear ribonucleoprotein (hnRNP)-like protein in Chlamydomonas functions as a cell-cycle repressor in the retinoblastoma cell-size control pathway | | | |
| **The 18th Int’l Conference on the Cell and Molecular Biology of Chlamydomonas**,Washington DC | | | | 2018.6 | |
| **Travel Award** by the Committee for Scientific Training and Mentoring at the Danforth Plant Science Center | | | |
| [10] Poster: **Liu, D**., Lopez-Paz, C., Geng, S., and Umen, J.G. Identification of Chlamydomonas reinhardtii endogenous genic flanking sequences for improved transgene expression. | | | |
| [11] Poster: **Liu, D**., Lopez-Paz, C., and Umen, J.G. A heterogeneous nuclear ribonucleoprotein (hnRNP)-like protein in Chlamydomonas functions as a cell-cycle repressor in the retinoblastoma cell-size control pathway | | | |
| **2018 Danforth Plant Science Center Annual Retreat**, Potosi, MO | | | | 2018.5 | |
| **Best Talk Award** by the Danforth Plant Science Center Retreat Committee (talk [12]) | | | |
| [12] Talk: **Liu, D**., Lopez-Paz, C., and Umen, J.G. A heterogeneous nuclear ribonucleoprotein (hnRNP)-like protein in Chlamydomonas functions as a cell-cycle repressor in the retinoblastoma cell-size control pathway | | | |
| T**he 4th Int’l Volvox Conference**, St. Louis, MO | | | | 2017.8 | |
| Designed the conference logo and giveaways | | | |
| Volunteered at the registration desk | | | |
| **The 17th Int’l Conference on the Cell and Molecular Biology of Chlamydomonas,** Kyoto, Japan | | | | 2016.6 | |
| **Travel Award** by the Committee for Scientific Training and Mentoring at the Danforth Plant Science Center | | | |
| **Best Poster Award** by the 17th Int’l Conference on the Cell and Molecular Biology of Chlamydomonas (poster [14]). | | | |
| [13] Poster: **Liu, D**., Li, Y., Lopez-Paz, C., Olson, B.J., and Umen, J.G. A new class of cyclin dependent kinase in Chlamydomonas is required for coupling cell size to cell division. | | | |
| [14] Poster: **Liu, D**.and Umen, J.G. Testing the constancy of the nuclear : cell volume ratio in wild type and cell-size mutants of Chlamydomonas. | | | |
| **2016 Danforth Plant Science Center Annual Retreat,** Grafton, IL | | | | 2016.5 | |
| **Best Talk Award** by the Danforth Plant Science Center Retreat Committee (talk [15]). | | | |
| [15] Talk: **Liu, D**., Li, Y., Lopez-Paz, C., Olson, B.J., and Umen, J.G. A new class of cyclin dependent kinase in Chlamydomonas is required for coupling cell size to cell division. | | | |
| [16] Poster: **Liu, D**., Li, Y., Lopez-Paz, C., Olson, B.J., and Umen, J.G. A new class of cyclin dependent kinase in Chlamydomonas is required for coupling cell size to cell division. | | | |
| **The 16th Int’l Conference on the Cell and Molecular Biology of Chlamydomonas**, Pacific Groves, CA | | | | | 2014.6 |
| **Travel Award** by the **Genetics Society of America** | | | |
| [17] Poster: **Liu, D**., Li, Y., Lopez-Paz, C., Olson, B.J., and Umen, J.G. A new class of cyclin dependent kinase in Chlamydomonas is required for coupling cell size to cell division. | | | |
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| Invited Talks and workshops | |  | | |
| Chinese University of Hong Kong (Hong Kong), hosted by Dr. XiaoHong ZHUANG 2019. 11   * **Talk:** The conserved retinoblastoma tumor suppressor pathway controls cell size in Chlamydomonas * **Workshop:** An introduction of the Volvocine algae family, from the evolution of the multicellularity to the multiple fission cell cycle * **Hands-on in lab:** Immunofluorescence microscopy to detect protein of interest in Chlamydomonas. | | | | |
| Westlake University (Zhejiang, China), hosted by Dr. XiaoBo LI 2019.11   * **Talk:** The conserved retinoblastoma tumor suppressor pathway controls cell size in Chlamydomonas * **Hands-on in lab:** [1] Protein extraction and co-immunoprecipitation in Chlamydomonas. [2] Sexual mating in Chlamydomonas. | | | | |

# Internships

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| Bayer CropScience LLC, Chesterfield. MO. | Summer 2022 |
| [Chinese Academy of Agricultural Sciences,](http://www.gscaas.net.cn/vacancy/) Beijing, China   * Analyzed the transcriptome of an anti-freeze protein in tobacco *Nicotiana benthamiana.* | Summer 2011 |
| [National Institute of Metrology](http://en.nim.ac.cn/), Beijing, China   * (Analytical Chemistry Department) Operated liquid chromatography-mass spectrometry. | Summer 2010 |

# Education and Outreach Activities

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| California College of the Arts, CA  FASHN-3200-2- Investigative Studio: Biodesign   * Guest lecturer for undergraduate art-major students   Designed and presented “Why do we care about algae?” explaining (1) algae hunting, (2) algae culturing, (3) algae in daily lives, and (4) general algae research topics. | 2022.2 |
| The Institute for School Partnership at Washington University in St. Louis, MO  Educ.6008.51 - Teaching the Process of Scientific Investigation   * Guest lecturer on a virtual panel for K-8 science teachers. * Designed and presented “Efficient Interpretation of Science,” explaining (1) designing STEM projects for students, (2) introducing science to a general audience, and (3) broadcasting science outside of academic settings. | 2020.7 |
| South City Academy STEAM Night, Confluence Charter Schools, MO   * Designed and led the project “Science in Plants.” * Representative of the Danforth Plant Science Center Booth. * Taught pre-K to 8th grades (~ 840 students) about (1) differences between plants and animals, (2) photosynthesis and C3, C4, and CAM plants. | 2020.2 |
| DDPSC Students Field Trips for Ladue Horton Watkins High School, Ladue School District, MO   * Led project “**Discover Volvox Development**.” * Taught 10th grade from (8 sessions, ~60 students) about evolution and germ-somatic cell differentiation by characterizing wild type and developmental mutants of Volvox under dissecting microscope. | 2019.12 |
| STEM DAY at Meadows Elementary, Riverview Gardens School District, MO   * Led project “**Strawberry DNA Extraction.**” * Taught 5th grade (7 sessions, ~100 students)about DNA by isolating DNA from frozen strawberries using soap, salt, and isopropyl-alcohol. | 2019.3 |
| Raspberry Pi Jam at Danforth Plant Science Center   * Volunteered at the **Snap Circuit** booth. | 2019.1 |
| STEM DAY at Marvin Elementary School, Ritenour School District, MO   * Led project “**Ice Tray Battery.**” * Taught 1st grade (7 sessions, ~80 students)about electric circuit by lighting LED lights using ice tray, copper wire, steel nails, and cooking vinegar. | 2018.5 |
| STEM DAY at Jury Elementary School, Hazelwood School District, MO   * Led project “**Rainbow in a Jar.**” * Taught pre-K (8 sessions, ~80 students)about density by making a rainbow cocktail in a glass jar using soap, water, cooking oil, and colored isopropyl-alcohol. | 2018.3 |
| Raspberry Pi Jam at Danforth Plant Science Center   * Volunteered at the **Soldering** booth. | 2018.1 |

# Career Development Activities

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| * **Mentor** of1st year rotation PhD student at Washington University | Spring 2022, Spring 2019 | | | |
| * Member of the **American Society for Cell Biology (ASCB)** | 2019.7-present | | | |
| * **THREE MINUTE THESIS (3MT®) Workshop.** Donald Danforth Plant Science Center. | 2019.7 | | | |
| **Final round competitor** in science communication event titled "**Science Impacting Society:**  **Lightning Talks**" for a broad public audience of 100+ | | | | |
| * Memberof the **American Society of Plant Biologists (ASPB)** | 2019.1-present | | | |
| * **Teaching Assistant** of **BIOL2013 Genetics laboratory**,University of Missouri, St. Louis | Spring 2018 | | | |
| * Attendee of **Confocal Microscopy** **Workshop**. Donald Danforth Plant Science Center. | | | | Spring 2014 |
| * **Teaching Assistant** of **BIO320 Genetics**,Stony Brook University | | | Spring 2012 | |
| * Memberof **Undergraduate** **Biochemistry Society**, Stony Brook University | | 2010.10 – 2012.5 | | |

# Contracting Work and Side Projects

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| * Contractor at Pop Science official account ***Principia1687* 原理** | 2021.1-2021.12 |
| * **Writer/Editor/Proposal Designer.** * Participated in **10+ pop science articles.** * Received **200K+ combined views** on WeChat. | |
| * **English Subtitle Translator** for documentaries by **Director** **Ryo Takeuchi 竹内亮** | 2020.6-present |
| * Translated dialogues and voice-over originally in Chinese or Japanese into English. * Participated in **5+ documentaries** including *Long Time No See, Wuhan* (2020), *Beyond*   *the Mountain* (2021), and *Two-Sided the Olympics: TOKYO 2020 DIARY* (2021).   * Received **10M+ combined views** on YouTube. | |

# Other Responsibilities and Activities

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| * Staff lecturer at **St. Louis Modern Chinese School** * Designed syllabus and taught Chinese-as-the-Second-Language to adult English-speakers. * Substitute teacher for 7th grade Chinese. * Primary teacher at 2021 Chinese Cultural Immersion Youth Summer Camp by Associations of Chinese-Americans. **Teacher representative/Speaker** at the world-wide online graduation ceremony. | 2021.6 – present  2022 Fall  2022 Spring  2021 Summer | |
| * Member of **Japan America Society Women’s Association of St. Louis** (JASWA). * **Board Member.** * **Communication Coordinator** to set up Zoom meetings and arrange/organize venues. * **Editor** of the bi-monthly English-Japanese bi-lingual JASWA newsletter. * **Editor** of the annual JASWA directory. * **Hospitality Assistant.** Sent crafts, hand-made cards, and flowers to members. | 2018.12-present  2019.12-present  2022.1-present  2019.10-2021.12  2019.10-2021.12  2019.10-2020.3 | |
| * Member of Japanese Traditional Dance Group Tohzan-ryu (**日本舞踊 - 東山流**) * Solo stage performance O-getsu-sama (**お月様**) at the Japanese Festival in St. Louis | 2019.9-present | |
| * Member of **St. Louis Bon Odori** **Group** (**盆踊り**) | 2017.5-present | |
| * Performed at the St. Louis Japanese Festival for four years * Performed at cultural events at Lindenwold University and Maryville University | | |
| * Completion of a **Half Marathon**. Go! St. Louis 2018 | | 2018.4 |
| * **Certificate of Completion in Bartending/Mixology**, the Bartending Institute of St. Louis | | 2017.6 |
| * **Official Volunteer** for road guidance at **2008 Beijing Summer Olympic Games** | | 2008.8 |