<table>
<tr><td>Technology/ Title</td><td colspan="3">Taiwan Zebrafish Core Facility</td></tr>
<tr><td>Subtitle</td><td colspan="3">Taiwan Zebrafish Technology and Resource Center</td></tr>
<tr><td>Technology Type</td><td>■ Biotechnology</td><td colspan="2">□Device/Diagnostics</td></tr>
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<tr><td>Link</td><td colspan="3">https://tztrc.weebly.com/</td></tr>
<tr><td>Technology Description</td><td colspan="3">The Taiwan Zebrafish Technology and Resource Center (TZTRC) provides a one-stop in vivo zebrafish platform for academic and industry partners. Zebrafish offer unique advantages for translational research and product evaluation, including transparent embryos and larvae, rapid development, and cost-effective in vivo assays. Operated within the National Health Research Institutes (NHRI), the zebrafish facility is AAALAC-accredited, supporting high standards of animal care, experimental reliability, and translational applications. By integrating genetic engineering, disease modeling, screening, behavioral analysis, and standardized toxicity testing, TZTRC supports rapid efficacy and safety assessment from early discovery to applied R&D.

Key technology platforms and services include:

• CRISPR/Cas9 gene editing: generation of zebrafish mutant lines, including targeted knockout and customized genome-editing services.

• Tol2-Gateway transgenesis: development of transgenic zebrafish lines for reporter assays, disease modeling, and functional studies.

• Disease model generation: establishment of zebrafish models for biomedical research, drug discovery, and mechanism-of-action studies.

• Phenotypic and drug screening: in vivo compound evaluation using embryonic, larval, or adult zebrafish models with imaging-based readouts.

• Behavioral analysis: quantitative assessment of locomotor activity and behavioral phenotypes for neurotoxicity, disease modeling, and functional screening.

• Embryo-based toxicity testing: standardized safety assessment using zebrafish embryos, including OECD TG236 fish embryo toxicity testing.

• Endocrine activity testing: OECD TG250 EASZY assay using Tg(cyp19a1b:GFP) zebrafish to evaluate estrogenic activity.</td></tr>
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	• **Wastewater acute toxicity testing:** ISO 15088 zebrafish egg acute toxicity testing for environmental and industrial wastewater evaluation. ISO 15088 testing is operated under ISO/IEC 17025 accreditation.
Intellectual Property	none
Key Publications	1. Dong TNM, Boncan DAT, Tan CAM, **Liu DW**, Sun HY, Huang TW, Hsu CH, Chu KC, Ulhaq ZS, Lai KP, Drummond DR, Ogino Y, **Jiang YJ**, **You MS**, Chen JK, Chan TF & Tse WKF (2026) E-cigarette vapor alters gut microbiota composition in zebrafish. Sci Total Environ. 1012: 181199. doi: 10.1016/j.scitotenv.2025.181199. 2. Ulhaq ZS, **You MS**, Yabe T, Takada S, Chen JK, Ogino Y, **Jiang YJ** & Tse WKF (2024) Fgf8 contributes to the pathogenesis of Nager syndrome. 280: 135692. doi: 10.1016/j.ijbiomac.2024.135692. 3. Ulhag ZS, **You MS**, **Jiang YJ** & Tse WKF (2024) P53 inhibitor or antioxidants reduce the severity of ethmoid plate deformities in zebrafish type 3 Treacher Collins syndrome model. Int J Biol Macromol. 266: 131216. doi: 10.1016/j.ijbiomac.2024.131216. 4. Zhao L, Fong SH, Yang Q, **Jiang YJ**, Korzh V & Liou YC (2023) The prolyl isomerase Pin1 stabilizes NeuroD during differentiation of mechanoreceptors. Front. Cell Dev. Biol. 11: 1225128. doi: 10.3389/fcell.2023.1225128 5. Liao WN, **You MS**, Ulhaq ZS, **Jiang YJ**, Chen JK & Tse WKF (2023) Micro-CT analysis reveals the changes of bone mineral density in zebrafish craniofacial skeleton with age. Journal of Anatomy, 242: 544–551. doi: 10.1111/joa.13780. 6. **Jiang YJ**[&], Fann CSJ[&], Fuh JL, Chung MY, Huang HY, Chu KC, Wang YF, Hsu CL, Kao LS, Chen SP & Wang SJ (2022) Genome-Wide Analysis Identified Novel Susceptible Genes of Restless Legs Syndrome in Migraineurs. *J. Headache Pain*, 23: 39. doi: 10.1186/s10194-022-01409-9. ([&]co-first author). 7. Lu YF, **Liu DW**, Li IC, Lin J, Wang CM, Chu KC, Kuo HH, Lin CY, Yih LH, **Jiang YJ*** & Hwang SPL* (2021) Delta/Jagged-mediated Notch signaling induces the differentiation of *agr2*-positive epidermal mucous cells in zebrafish embryos. *PLoS Genet.* 17: e1009969. doi: 10.1371/journal.pgen.1009969. (*co-corresponding author). 8. Chung MY, Chen SJ & **Jiang YJ** (2021) Phenotype Variability in the Patients of Familial Exudative Vitreoretinopathy: the RCBTB1 case. Curr Eye Res. 46: 1931. doi:

10.1080/02713683.2021.1924383.

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10. Hsu CH, Liou GG & **Jiang YJ** (2020) *Nicastrin* deficiency induces Tyrosinase-dependent depigmentation and skin inflammation. *J. Invest. Derma.* 140: 404-414; doi: 10.1016/j.jid.2019.07.702.

11. Tsai SM, Chu KC & **Jiang YJ** (2020). Newly identified Gon4l/Udu-interacting proteins implicate novel functions. *Sci. Rep.* 10: 14213. doi: 10.1038/s41598-020-70855-9.

12. **You MS**, Wang WP, Wang JY, **Jiang YJ** & Chi YH (2019) Sun1 mediates interkinetic nuclear migration and Notch signaling in the neurogenesis of zebrafish.Stem Cells Dev. 28: 1116-1127. doi: 10.1089/scd.2019.0063.

13. Lai KP, Li JW, Hsu CH, **You MS**, Chan TF, Tse WKF & **Jiang YJ** (2018) Comparative transcriptomic characterization of a new mib mutant allele, mibnn2002, in zebrafish. Gene642: 51-57. doi: 10.1016/j.gene.2017.11.016.

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15. Chou CW, Lin J, **Jiang YJ** & Liu YW (2017) Aberrant global and Jagged-mediated Notch signaling disrupts segregation between wt1-expressing and steroidogenic tissues in zebrafish. Endocrinology. 158: 4206-4217. doi: 10.1210/en.2017-00548.

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17. **You MS**, **Jiang YJ**, Yuh CH, Wang CM, Tang CH, Chuang YJ, Lin BH, Wu JL & Hwang SPL (2016) A sketch of the Taiwan Zebrafish Core Facility. Zebrafish. 13 Suppl 1:S24-9. doi: 10.1089/zeb.2015.1208.

18. Wu, J.-H., Liu, J.-H., Ko, Y.-C., Wang, C.-T., Chung, Y.-C., Chu, K.-C., Liu, T.-T., Chao, H.-M., **Jiang, Y.-J.*** Chen, S.-J.* and Chung,

	M.-Y.* (2016). Haploinsufficiency of RCBTB1 is associated with Coats Disease and Familial Exudative Vitreoretinopathy. *Hum. Mol. Genet.*, 25, 1637-1647; doi: 10.1093/hmg/ddw041. (*co-corresponding author). 19. Tseng LC, Tang CH & **Jiang YJ** (2016) Morphology and gene expression screening with morpholinos in zebrafish embryos. In *High-Throughput RNAi Screening*, Azorsa, D. and Arora, S. (eds.), Book series of "Methods in Molecular Biology", Vol. 1470, 213-224; doi: 10.1007/978-1-4939-6337-9_17. Humana Press, New York, USA. Lau MCC, Kwong EML, Lai KP, Li JW, Ho JCH, Chan TF, Wong CKC, **Jiang YJ** & Tse WKF (2016) Pathogenesis of POLR1C-dependent Type 3 Treacher Collins Syndrome revealed by a zebrafish model. Biochim Biophys Acta. 1862: 1147-58. doi: 10.1016/j.bbadis.2016.03.005.
Business Opportunity	Seeking partners in biopharmaceuticals, health foods/nutraceuticals, cosmetics/personal care, chemicals, textile/dyeing, and environmental safety sectors for: fee-for-service testing, customized zebrafish disease/toxicity models, compound or product screening, and wastewater toxicity evaluation.