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- 國立臺灣大學 學士，民國八十一年
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- 美國馬里蘭大學 博士，民國八十八年
- B.S. National Taiwan University, 1992
- M.S. University of Maryland USA, 1996
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主要研究領域

■ 基因治療

發展桿狀病毒作為基因治療載體，探討影響基因傳遞與表現之機轉及以分子生物技術改良其基因表現。

■ 組織工程與再生醫學

應用桿狀病毒傳遞生長因子基因或non-coding RNA以促進組織再生。

■ 代謝工程

開發基因改造及合成生物學技術，調控微生物內代謝路徑，以生產化學品。

■ 利用 CRISPR/CRISPRi 進行基因修改及調控

利用CRISPR/CRISPRi相關技術調控基因，進而增加目標產物之產量，或調控幹細胞分化，並應用於組織工程。

■ 癌症治療

開發新型蛋白質奈米顆粒用於RNA自包裹以及癌症治療。

Main Research Interests

■ Gene Therapy

Development of baculovirus as a gene delivery vector. Application of molecular biology techniques to enhance and prolong transgene expression. Exploiting synthetic biology concept to develop baculovirus vectors for diverse applications.

■ Tissue Engineering

Development of novel baculovirus vectors to deliver anabolic genes and/or non-coding RNA to promote tissue regeneration/repair.

■ Metabolic Engineering

Development of new techniques to engineer microorganisms for the production of chemicals.

■ CRISPR-based Genome Editing and Regulation

Combining CRISPRi and CRISPRa to manipulate the cellular metabolic networks to exploit cells for bio-derived product production or to regulate cell differentiation for tissue regeneration.

■ Cancer Therapy

Development of new protein-based nanoparticles for RNA self-packaging and cancer therapy.

代表作 (Selected Publications)

- Truong, V.A., Chang, Y.H., Dang, T.Q., Tu, Y., Tu, J., Chang, C.-W., Chang, Y.H., Hu, Y.-C.*. 2024. Sep. Programmable editing of primary microRNA switches stem cell differentiation and improves tissue regeneration. *Nature Communications*. 15:8358 (IF 14.7).
- Chang, C.-W., Truong, V.A., Pham, N.N., Hu, Y.-C.*. 2024. Aug. RNA-guided genome engineering: paradigm shift towards transposons. *Trends in Biotechnology*. 42: 970-985 (IF 14.3) Review paper.
- Nguyen, NTK, Lee, H.-S., P.-H. Chen, Truong, V.A., Chang, Y.-H., Pham, N.N., Chang, C.-W., Pham, D.-H., Ngo, DKT, Truong, V.A., Dang, Q.T., Chang, Y.-H., Hu, Y.-C.*. 2024 May. Enhanced calvarial bone repair using ASCs engineered with RNA-guided Split dCas12a system that co-activates Sox5, Sox6 and long non-coding RNA H19. *Small*. 20: 2306612 (Invited paper, IF 13).
- Nguyen, NTK, Tu, Y., Lee, H.-S., Truong, V.A., Chang, Y.-H., Pham, N.N., Chang, C.-W., Lin, Y.-H., Lai, P.-L., Chen, P.-H., Parfyonova, Y.V., Menshikov, M., Chang, Y.-H., Hu, Y.-C.*. 2023 June Split dCas12a activator for lncRNA H19 activation to enhance BMSC differentiation and promote calvarial bone healing. *Biomaterials*. 297:122106. (IF 12.8).
- Truong, A.V., Lin, Y.-H., Nguyen, TKN, Hsu, M.-N., Pham, N.N., Chang, Y.-H., Chang, C.-W., Shen, C.-C., Lai, P.-L., Parfyonova, Y.V., Menshikov, M., Wu, J.-C., Chang, Y.-H., Hu, Y.-C.*. 2022 Jan. Bi-directional gene activation and repression promote ASC differentiation and enhance bone healing in osteoporotic rats. *Molecular Therapy*. 30: 92-104. (IF 12.1).
- Nguyen, TKN, Chang, Y.-H., Truong, A.V., Hsu, M.-N., Pham, NN, Chang, C.-W., Wu, Y.-H., Chang, Y.-H., Li, H., Hu, Y.-C.*. 2021 Aug. CRISPR activation of long non-coding RNA DANCER promotes bone regeneration. *Biomaterials*. 275: 120965 (IF 12.8).
- Hsu, M.-N., Yu, F.-J., Chang, Y.-H., Huang, K.-L., Pham, N. N., Truong, A.V., Lin, M.-W., Nguyen, N.T.K., Hwang, S.-M., Hu, Y.-C.*. 2020 Sep. CRISPR interference-mediated Noggin knockdown promotes BMP2-induced osteogenesis and calvarial bone healing. *Biomaterials*. 252: 120094. (IF 12.8).
- Hsu, M.-N., Huang, K.-L., Yu, F.-J., Lai, P.-L., Truong, A.V., Lin, M.-W., Nguyen, N.T.K., Shen, C.-C., Hwang, S.-M., Chang, Y.-H., Hu, Y.-C.*. 2020 Feb. Co-Activation of endogenous Wnt10b and Foxc2 by CRISPR activation enhances BMSCs osteogenesis and promotes calvarial bone regeneration. *Molecular Therapy* 28: 441-451 (IF 12.1).
- Hsu, M.-N., Chang, Y.-H., Truong, V. A., Nguyen, N.T.K., Hu, Y.-C.*. 2019 Dec. CRISPR technology for stem cell engineering and regenerative medicine. *Biotechnology Advances* 37:107447. (IF 12.1).
- 1.Hsu, M.-N., Hu, Y.-C.*. Local magnetic activation of CRISPR. 2019 Feb. *Nature Biomedical Engineering*. 3: 83-84. (IF 26.8).
- Truong, V. A., Hsu, M.-N., Nguyen, N.T.K., Lin, M.-W., Shen, C.-C., Lin, C.-Y., Hu, Y.-C.*. 2019. July. CRISPRai for simultaneous gene activation and inhibition to promote stem cell chondrogenesis and calvarial bone regeneration. *Nucleic Acids Research*. 47: e74 (IF 16.6).

