

Curriculum Vitae

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Academic qualifications:

➤ *Aug. 2021- Jul. 2023 (expected)*

Master of Philosophy in Chinese Medicine Chinese University of Hong Kong

Thesis 1: Discovery of DNA aptamers against DKK1.

Thesis 2: Identification of new functional domain of DKK1.

Thesis 3: The evaluation of *in vivo* efficacy on bone and cardiovascular function of therapeutic aptamers against sclerostin.

cGPA: 3.16/4

➤ *Sept. 2015- Aug. 2019*

Bachelor of Pharmacy (Hons) in Chinese Medicine Hong Kong Baptist University

Core curriculum: Microbiology and Immunology, Biochemistry and Molecular Biology, Pharmacology and Toxicology, Biomedical science, Chemical Analysis, Herbal Pharmacology etc.

cGPA: 3.05/4

Research Experience

➤ **Discovery of DNA aptamers against Dickkopf-1 (DKK1)**

Supervised by Prof. Ge Zhang, Dr. Yuanyuan Yu, Laboratory for aptamer selection and cell biology, HKAP

- ✓ SELEX technology was used for aptamer candidates screening. The library generated was sequenced by NGS and the enrichment trend of DNA pool was examined. The enrichment saturation occurred in 24th round of SELEX. The twenty aptamer candidates with the highest occurrence were characterized with their affinity and cell potency while eight of them were predicted to form G-quadruplex structures.
- ✓ A novel aptamer against DKK1 was developed with high affinity and cell potency. The affinity was <10 nM and its inhibition potency was <400 nM *in vitro*. The serum stability of the aptamer was greatly improved after chemical modification. The specific binding domain of aptamer in protein was determined to ensure domain-specific targeting.

➤ **Identification of new functional domain of DKK1**

Supervised by Prof. Ge Zhang, Dr. Yuanyuan Yu, Laboratory for aptamer selection and cell biology, HKAP

- ✓ Linker 2 of DKK1 was investigated as a new functional domain. Different plasmids of DKK1 with Linker 2 deficiency or mutation were constructed, and their expression level were verified for cell assays. Purification of DKK1 protein with domain deficiency or mutation was conducted for functional mechanism study.

➤ **Evaluation of efficacy on bone and cardiovascular function of therapeutic aptamers against sclerostin *in vivo*.**

Supervised by Prof. Ge Zhang, Dr. Yuanyuan Yu, Laboratory for aptamer selection and cell biology, HKAP

- ✓ The efficacy of administration of Apc001PE on aortic aneurysm and atherosclerosis progression in specific mice model was investigated, including the ratio of atherosclerotic plaque area to total *en face* area of aortic arches, and the ratio of atherosclerotic lesion area to total cross cryo-section area of aortic roots.
- ✓ The efficacy of administration of Apc001PE on bone formation in OI mice was investigated, including measurement of trabecular bone (below the growth plate) at the metaphysis of the proximal tibia by Micro-CT.

Publications

Curriculum Vitae

1. Yu Y, Wang L, Ni S, Li D, Liu J, **Chu HY**, Zhang N, Sun M, Li N, Ren Q, et al. Targeting loop3 of sclerostin preserves its cardiovascular protective action and promotes bone formation. *Nature Communication* (2022) 13:1-16. (Impact factor: 17.69)
2. Wang L, Yu Y, Ni S, Li D, Liu J, Xie D, **Chu HY**, Ren Q, Zhong C, Zhang N, et al. Therapeutic aptamer targeting sclerostin loop3 for promoting bone formation without increasing cardiovascular risk in osteogenesis imperfecta mice. *Theranostics* (2022) 12:5645-5674. (Impact factor: 11.60)
3. Jiang H, Zhang Z, Yu Y, **Chu HY**, Yu S, Yao S, Zhang G, Zhang BT. Drug Discovery of DKK1 Inhibitors. *Frontiers in Pharmacology* (2022) 13:847387. (Impact factor: 5.51)
4. **Chu HY**, Chen Z, Wang L, Zhang ZK, Tan X, Liu S, Zhang BT, Lu A, Yu Y, Zhang G. Dickkopf-1: A Promising Target for Cancer Immunotherapy. *Frontiers in Immunology* (2021) 12:1–14. (Impact factor: 7.561)
5. Yu Y, Wang L, Ni S, Zhuo Z, **Chu HY**, Zhang N, Li D, Liu J, Lyu A, Zhang BT, Zhang G. Sclerostin loop3: a potential target for developing a next generation sclerostin inhibitor for bone anabolic therapy with low cardiovascular concern. *Journal Of Bone and Mineral Research* (2020) 35: 252. (Impact factor: 6.741)
6. Chen Z, Zhang N, **Chu HY**, Yu Y, Zhang ZK, Zhang G, Zhang BT. Connective Tissue Growth Factor: From Molecular Understandings to Drug Discovery. *Frontiers in Cell and Developmental Biology* (2020) 8:593269. (Impact factor: 6.684)
7. Dai R, Wu Z, **Chu HY**, Lu J, Lyu A, Liu J, Zhang G. Cathepsin K: The Action in and Beyond Bone. *Frontiers in Cell and Developmental Biology* (2020) 8:433. (Impact factor: 6.684)