Combinatorial testing of viral vector and CRISPR systems for precision genome editing

Li, Z.

Curriculum Vitae

Zhen Li was born on April 1st, 1993 in the city of Sanya, Hainan Province, China. During 2011-2016, he was enrolled in the 5-year Bachelor study of clinical medicine consisted of one year of general college studies (2011-2012) and 4 years of fundamental and clinical medicine (2012-2016), which includes one year of clinical internship rotation in the Tongji Hospital affiliated to Huazhong University of Science and Technology, Wuhan, China.

From the year of 2016 to 2019, he, as a Master student of Surgery, joined the group of Prof. Dr. Liping Su in the Department of General Surgery at the Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China, where he focused on the research investigating the impact of the long non-coding RNA *FMO6P* on the invasion and migration of gastric cancer cells. In the meantime, he also got the registered qualification certificate of practicing physician in 2017.

In the year of 2019, he received the Ph.D. scholarship from the China Scholarship Council - Leiden University joint program to chase the doctoral diploma in the Netherlands. With the supervision of Prof. Dr. Rob C. Hoeben and Dr. M.A.F.V. Gonçalves in the Department of Cell and Chemical Biology at the Leiden University Medical Center, he combined the CRISPR/Cas9 gene editing system and different viral vectors for achieving robust and versatile gene editing. Along with demonstrating the efficiencies of such viral vector-based system, he also probed the accuracy and specificity of the system of using different engineered Cas9 proteins delivered by viral vectors. Instead of being a full-time researcher in the laboratory, he prefers to engage with patients and choose to be a surgeon in a hospital.

List of Publications

1. **Li Z.**, Gonçalves M.A.F.V. “Soft” genome editing using CRISPR nickases as a potential source of safer cell products. Cell & Gene Therapy Insights 2023; 9:1201-1210. doi: 10.18609/cgti.2023.158.
2. **Li Z.**, Gonçalves M.A.F.V. AAV-vectored base editor *trans*-splicing delivers dystrophin repair. Molecular Therapy Nucleic Acids. 2023; 30;32:900-902. doi: 10.1016/j.omtn.2023.05.013.
3. **Li Z.**, Wang X., Janssen J.M., Liu J., Tasca F., Hoeben R.C., Gonçalves M.A.F.V. Precision genome editing using combinatorial viral vector delivery of CRISPR-Cas9 nucleases and donor DNA constructs. Nucleic Acids Res. 2025; 53(2):gkae1213. doi: 10.1093/nar/gkae1213.
4. **Li Z.***, Wang X.L.*, Liu J., Janssen J.M., Hoeben R.C., Gonçalves M.A.F.V. Selector AAV-CRISPR vectors purge off-target chromosomal insertions and promote precise genome editing. In preparation. * Shared first co-authorship

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It's a long and tough road to get here submitting the thesis for doctoral defense. Working with viruses is interesting and tricky, since we can use the power of our enemies to serve our own benefits but with amounts of intellectual and physical collaboration to achieve the goals by unpredictable cost. The explorative work presented in this thesis could be done by the financial supports of the China Scholarship Council - Leiden University joint program, the Prinses Beatrix Spierfonds, the Duchenne Parent Project NL, the Dutch Research Council (NWO) - Open Technology Program, and EU Marie Skłodowska-Curie Doctoral Network Actions. Beyonds the money, I also got the energy and confidence to finish the work from my family, friends, each member in Dr. Manuel Gonçalves' and Prof. Dr. Rob Hoeben's group, the personnel of the Flow Cytometry Core Facility of the LUMC and each people I met in CCB, LUMC, Leiden and the Netherlands. But at the very beginning, I am from Sanya in China, the route to Leiden is quite long, 5 years in Wuhan, 3 years in Shanghai and happily I am back to China pursuing the realization of the vow being a medical doctor. Till now I would like to thank all the people I met so far, not only the people I met in the journey to be a PhD, but each one I met in the journey of my life. No matter what experience the people I met brought to me, it makes who I am, therefore it's also appreciated to be parts of the live of the people I met. Since there are too many names of the people who I would like to cherish and acknowledge in the path of life. Limited by the space and preferring to express in a simple way personally, my sincere gratitude is to all the people I met, meet and will.