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Coiled-coil biomaterials for biological applications

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Citation

Shen, M. (2021, November 24). *Coiled-coil biomaterials for biological applications*. Retrieved from <https://hdl.handle.net/1887/3243305>

Version: Publisher's Version

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ABBREVIATIONS

CHO	Chinese Hamster Ovary cell
CD20	Cluster of Differentiation 20
CY5	Cyanines 5
Cys	Cysteine
CD	circular dichroism
CFU	colony forming units
DLS	Dynamic light scattering
DIC	N,N'-Diisopropylcarbodiimide
DIPEA	N,N-Diisopropylethylamine
DMF	Dimethyl Formamide
DCM	Dichloromethane
DS	Degree of substitution
DMEM	Dulbecco's Modified Eagle Medium
DCR	Derived Count Rate
DVS	Divinyl Sulfone
DMSO	Dimethyl Sulfoxide
DOPE	1,2-dioleoyl-sn-glycero-3-phosphoethanolamine
DOPC	1,2-dioleoyl-sn-glycero-3-phosphocholine
EDTA	Ethylenediaminetetraacetic acid
FACS	Fluorescence-activated Cell Sorting
FSC	forward scatter
FRET	Förster resonance energy transfer
FCS	Fetal Calf Serum
GFP	Green Fluorescence Protein
GdnHCl	Guanidinium chloride
HPMA	2-Hydroxypropyl Methacrylate
HCTU	2-(6-Chloro-1-H-benzotriazole-1-yl)-1,1,3,3-tetramethylaminium

	hexafluorophosphate
HPLC	High Performance Liquid Chromatography
IOPs	Iron Oxide Particles
LrB	LrB: Lissamine rhodamine B
LC-MS	Liquid chromatography–mass spectrometry
LPMA	L-Phase Medium
LPB	L-phase broth
MACS	Magnetic-activated Cell Sorting
MWCO	Molecular weight cut-off
MeCN	acetonitrile
MIC	Minimum inhibitory concentration
MeOH	Methanol
NBD	Nitrobenzoxadiazole
NMR	Nuclear Magnetic Resonance spectroscopy
PEG	Polyethylene glycol
PI	Propidium iodide
PEI	Polyethylenimine
PDGFRB	platelet-derived growth factor receptor beta
PBS	Phosphate buffered saline
PDI	Polydispersity Index
SNARE	Soluble N-ethylmaleimide-sensitive factor activating protein receptor
SRb	Sulforhodamine B
SNAP-25	Synaptosomal-Associated Protein-25
TMD	Transmembrane Domain
Trp	Tryptophan
TFA	Trifluoroacetic acid
TEM	Transmission Electron Microscope
VAMP	Vesicle Associated Membrane Protein

LIST OF PUBLICATIONS

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4. Guan, A. J.; **Shen, M. J.**; Zhang, E. X.; Li, Q.; Wang, L. X.; Xu, L. J.; Xiang, J. F.; Tang, Y. L. Stabilizing G-quadruplex DNA by methylazacalix[n]pyridine through shape-complementary interaction. *Bioorg Med Chem Lett* **2016**, *26*, 609.
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7. **Shen, M. J.**; Zeng, Y.; Singhal, A.; Sevink, A.; Boyle, A. L.; Kros, A. Enhanced Liposomal Drug Delivery via membrane fusion triggered by Dimeric Coiled-coil Peptides. **Manuscript in preparation.**
8. **Shen, M. J.**; Boyle, A. L.; Kros, A. Investigating the Effect of Peptide Length on Coiled-Coil Stability, Self-Assembly, and Fusogenicity. **Manuscript in preparation.**
9. Shitut, S.; **Shen, M. J.**; Claushuis, B.; Derks, R. J. E.; Giera, M.; Rozen, D.; Claessen, D.; Kros, A. Increased membrane fluidity facilitates bacterial cell-cell fusion. **Manuscript in preparation.**
10. Daudey, G. G. A.; **Shen, M. J.**; Singhal, A.; Van der Est, P.; Sevink, A.; Boyle, A. L.; Kros, A. Liposome fusion with orthogonal coiled-coil peptides as fusogens: The efficacy of roleplaying peptides. *Chem. Sci.* **2021**. **Accepted**

CURRICULUM VITAE

Mengjie Shen was born on July 14, 1988, in Linqu, Weifang city, Shandong province, R.P. China. Linqu is a small city named after an extinct volcano whose name is Mount Qu. Weifang is one of the biggest cities in Shandong province and the alternate name of Weifang in ancient times is “YuanDu (鸢都)”, which means “the Capital of Kites”.

In 2009, Mengjie started his bachelor study at Qingdao University of Science & Technology, where he obtained his bachelor's degree in chemistry four years later. In 2013, he continued his study in organic chemistry as a master student at Renmin University of China. In the following three years, he worked with Prof. Han-Yuan Gong from Beijing Normal University studying of Host-Guest interaction between the macrocyclic compound and small aromatic molecules. Also, he worked with Prof. Ya-Lin Tang from the Institute of Chemistry Chinese Academic of Science in researching the DNA G-quadruplex based “molecular switch”. After graduation in 2016, he moved to the Netherlands to start his PhD at Leiden University in the research group of Supramolecular & Biomaterials Chemistry. During his PhD, he was interested in coiled-coil based biomaterials and designed different E/K coiled-coil variants for various biological applications, such as membrane fusion and cell sorting.

ACKNOWLEDGEMENTS

“I’ve had my ups and downs. My fair share of bumpy roads and heavy winds. That’s what made me what I am today.” It’s a tough journey along with challenges and some accomplishments. Looking back to the past five years, I met lots of people and experienced lots of things, which helped me grow up. I appreciate those who helped and supported me during this journey.

Firstly, I would like to thank Alexander Kros for offering me the chance to join SBC group and doing research at Leiden University. You are always kind, patient and wisdom. I really appreciate your guide and inspiration. Also, I would like to extend my sincere gratitude to Aimee Boyle, who is not only my copromotor but also a role model and very good friend to me. Thank you for teaching me everything in scientific research and also life. Without your help and encouragement, I cannot finish my PhD and this thesis. Besides, I would like to thank René Olsthoorn who helped me a lot in the first year of my PhD. At that time, I can't communicate with people in English fluently. Thank you for your patience and kindness. I improved a lot in communication and biological experimental skills during that time, which has a strong influence on the next four years of my PhD.

I would like to thank all the lab cooperators from IBL. They are Dennis Claessen, Shraddha Shitut, Daniel Rozen, Renée Kapteijn and Thomas van Dijk. I learned a lot from all our discussions and I enjoyed a lot when performing experiments in the microbiology lab together. Special thanks to Shraddha who share lots of biological knowledge with me and help me a lot with thesis writing.

Then, I would like to express my heartfelt gratitude to my colleagues. They are Roy, Niek.C, Elena, Dimitris, Niek.H, Jeroen, Fred, Thom.S, Nicola, Lily, Tingxian, Ciqing, Jolinde, Panagiota, Bart Jan, Willem, Weizhe, Winant, Viorica, Michelle, Dinghao, Xuecheng, Ye, Dennis, Oscar, Lin, Wangyang, Xue, Nol, Ying, Wei, Jaco, Wessel, Stephen, Sandeepa, Joyal, Suchismita, Jasper, Jorn, Indigo, David, Gabriela, Thomas, Max, Batuhan, Grégory, Sander, Roxanne and all other SBCers. Having all of you around during the past five years is a great honour for me. I would also like to thank Gerda Lamers for training me TEM and confocal microscopy and Thomas Bakkum for training me FACS.

One of the best accomplishments at Leiden is that I made a lot of good friends. I would like to thank all my friends who make my life colourful in these years. They are Yang Shao, Xuequan Zhou, Shengxiang Yang, Mingchuan Luo, Diyu Zhang, Xiaoting Chen, Zhen Wang, Qingju Zhang, Junfei He, Hui Jin, Jing Zhang, Qi Zhang, Xinglin Jin, Na Zhou and Xuezi Tian. I will always remember the moments when we go travelling, cycling, fishing, hiking and many more things together. I am really happy to have all of you around in the past five years.

Then I would like to thank all my tennis friends, Chenguang Gao, Yu Wei, Yuchen Lian,

Xuequan Zhou, Ye Zeng and Deyi Wang. Playing tennis with you especially during the pandemic lockdown helped me release lots of pressure. I enjoyed the moments very much when we are running on the clay court regardless of rain and sunshine.

Also, I would like to thank my parents who always support me and encourage me in my life. I am very lucky to have parents like you. Since I was born, you suffered a lot to bring me up and you always give me the best you have. I hope I didn't and won't let you down in the past and future.

Last but not least, I would like to thank myself in the past. It's not an easy journey for 'you'. Lost, self-distrust, lonely, helpless, all of these feelings were around 'you' from time to time during your PhD. Thank you for your perseverance in all the struggling days and sleepless nights. "What doesn't kill you, makes you stronger." After all these, I hope 'you' can face the future with brave and confidence while smiling.

I wish everyone has good luck and a bright future. Hope to see you again somewhere in the corner of world in the future.

Mengjie Shen
16/09/2021

