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Title: Applications for activity-based probes in biomedical research on glycosidases

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List of Publications

1. Artola M,* **Kuo CL**,* Lelieveld LT, Rowland RJ, van der Marel GA, Codée JDC, Boot RG, Davies GJ, Aerts JMFG & Overkleeft HS (2019) Functionalized cyclophellitols are selective glucocerebrosidase inhibitors and induce a bona fide neuropathic Gaucher model in zebrafish. *J Am Chem Soc* 141, 4214–4218.
2. **Kuo CL**, Kallemijn WW, Lelieveld LT, Mirzaian M, Zoutendijk I, Vardi A, Futerman AH, Meijer AH, Spaink HP, Overkleeft HS, Aerts JMFG & Artola M (2019) In vivo inactivation of glycosidases by conduritol B epoxide and cyclophellitol as revealed by activity-based protein profiling. *FEBS J* 286, 584–600.
3. Artola M,* **Kuo CL**,* McMahon SA, Oehler V, Hansen T, van der Lienden M, He X, van den Elst H, Florea BI, Kermode AR, van der Marel GA, Gloster TM, Codée JDC, Overkleeft HS & Aerts JMFG (2018) New irreversible α -l-iduronidase inhibitors and activity-based probes. *Chemistry* 24, 19081–19088.
4. **Kuo CL**, van Meel E, Kytidou K, Kallemijn WW, Witte M, Overkleeft HS, Artola ME & Aerts JM (2018) Activity-based probes for glycosidases: profiling and other applications. *Methods Enzymol* 598, 217–235.
5. Schröder SP, van de Sande JW, Kallemijn WW, **Kuo CL**, Artola M, van Rooden EJ, Jiang J, Beenakker TJM, Florea BI, Offen WA, Davies GJ, Minnaard AJ, Aerts JMFG, Codée JDC, van der Marel GA & Overkleeft HS (2017) Towards broad spectrum activity-based glycosidase probes: synthesis and evaluation of deoxygenated cyclophellitol aziridines. *Chem Commun (Camb)*. 2017, 53, 12528–12531.
6. Aerts JMFG, Guimaraes Da Lomba Ferraz MJ, Mirzaian M, Gaspar P, Oussoren SV, Wisse P, **Kuo CL**, Lelieveld LT, Kytidou K, Hazeu MD, Boer DEC, Meijer R, Lienden MJC van der, Herrera D, Gabriel TL, Aten J, Overkleeft HS, Eijk MC van, Boot RG & Marques ARA (2017) Lysosomal storage diseases. for better or worse: adapting to defective lysosomal glycosphingolipid breakdown. *eLS*, 1–13.
7. Lahav D, Liu B, van den Berg RJBHN, van den Nieuwendijk AMCH, Wennekes T, Ghisaidoobe AT, Breen I, Ferraz MJ, **Kuo CL**, Wu L, Geurink PP, Ovaa H, van der Marel GA, van der Stelt M, Boot RG, Davies GJ, Aerts JMFG & Overkleeft HS (2017) A fluorescence polarization activity-based protein profiling assay in the discovery of potent, selective inhibitors for human nonlysosomal glucosylceramidase. *J Am Chem Soc* 139, 14192–14197.

8. Artola M, Wu L, Ferraz MJ, **Kuo CL**, Raich L, Breen IZ, Offen WA, Codée JDC, van der Marel GA, Rovira C, Aerts JMFG, Davies GJ & Overkleeft HS (2017) 1,6-Cyclophellitol cyclosulfates: a new class of irreversible glycosidase inhibitor. *ACS Cent Sci* 3, 784–793.
9. Wu L,* Jiang J,* Jin Y,* Kallemeijn WW, **Kuo CL**, Artola M, Dai W, van Elk C, van Eijk M, van der Marel GA, Codée JDC, Florea BI, Aerts JMFG, Overkleeft HS & Davies GJ (2017) Activity-based probes for functional interrogation of retaining β -glucuronidases. *Nat Chem Biol* 13, 867–873.
10. Jiang J, **Kuo CL**, Wu L, Franke C, Kallemeijn WW, Florea BI, van Meel E, van der Marel GA, Codée JD, Boot RG, Davies GJ, Overkleeft HS & Aerts JM (2016) Detection of active mammalian GH31 α -glucosidases in health and disease using in-class, broad-spectrum activity-based probes. *ACS Cent Sci* 2, 351–358.

List of publications prior to PhD research

11. Li N, **Kuo CL**, Paniagua G, van den Elst H, Verdoes M, Willems LI, van der Linden WA, Ruben M, van Genderen E, Gubbens J, van Wezel GP, Overkleeft HS & Florea BI (2013) Relative quantification of proteasome activity by activity-based protein profiling and LC-MS/MS. *Nat Protoc* 8, 1155–1168.
12. Brouwer AJ, Jonker A, Werkhoven P, **Kuo E**, Li N, Gallastegui N, Kemmink J, Florea BI, Groll M, Overkleeft HS & Liskamp RM (2012) Peptido sulfonyl fluorides as new powerful proteasome inhibitors. *J Med Chem* 55, 10995–11003.
13. Geurink PP, Florea BI, Li N, Witte MD, Verasdonck J, **Kuo CL**, van der Marel GA & Overkleeft HS (2010) A cleavable linker based on the levulinoyl ester for activity-based protein profiling. *Angew Chem Int Ed Engl* 49, 6802–6805.

* *Shared first-authorship*

Curriculum vitae

Chi-Lin (Ethan) Kuo was born on 11th June 1988 in Kaohsiung, Taiwan. He became interested in biology during an exchange year in high school (2006, West Hartford, Connecticut, USA). In 2007 he graduated from Kaohsiung Senior High School, and commenced his BSc study in Life Sciences at National Cheng-Kung University, Tainan, Taiwan. During this period he sought further experience abroad and was offered an one-year research internship opportunity in Prof. Hermen Overkleeft's group at Leiden University, the Netherlands. Here he studied activity-based probes (ABPs) for proteasomes. Parts of the results were later published in journals including *Nature Protocols* and *Journal of Medicinal Chemistry*.

After his graduation in 2011 (with honor) and a year of military service, he returned to Leiden University in 2012 for his MSc study in Life Science and Technology. Here he studied chemical biology of the ubiquitin-proteasome system under the supervision of Dr. Nan Li and Dr. Bobby Florea in the Overkleeft group. He also studied cellular processes related to autophagy in his minor internship under the supervision of Dr. Ruud Wijdeven in Prof. Sjaak Neefjes' group at the Netherlands Cancer Institute (NKI, Amsterdam). He graduated in 2014 *cum laude*.

In 2015 he began his PhD research in the newly-established Medical Biochemistry group at Leiden University. Under the supervision of Prof. Hans Aerts, the aim was to characterize glycosidase ABPs and their applications, particularly in the lysosomal storage disorders. Parts of the research described in this thesis were presented in the ESGLD conference (Naples, Italy, 2015, poster), the Joint Glycobiology Meeting (Nijmegen, NL, 2016, speech & poster), the annual ABPP conferences (Leiden, NL, 2017, speech; Oxford, UK, 2018, speech), the Molecular Medicines of Sphingolipids conference (Rehovot, Israel, 2018, poster), the Reedijk Symposium (Leiden, NL, 2018, poster), and the EWGGD conference (Clermont-Ferrand, France, 2019, Posters). Chi-Lin is currently a postdoctoral researcher in the Aerts group, while also conducting joint projects with the gene therapy company uniQure NV (Amsterdam, NL).

