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CRB1 gene therapy coming of age: mechanistic insight and rAAV assays on mouse & human retinal organoid models

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Curriculum Vitae

Thilo Matthias Buck was born on June 22nd, 1988 in Esslingen am Neckar, Germany. After finishing his business & economics high school at the Theodor-Heuss-Gymnasium (Abitur), Reutlingen, Germany, he went on to study psychology and economics in his bachelor studies at the University of Innsbruck, Austria. He transferred to the University of New Orleans, USA, in 2009, finishing his Bachelor's Degree (*magna cum laude*) in psychology with minors in chemistry and biology in 2012. During his bachelor studies he broadened his skills in internships in stress research (SPIT lab; supervisor: Dr. Elizabeth Shirtcliff), brain development (supervisor: Dr. Ben Hall), and Huntington's disease (supervisor: Dr. Gerald J. LaHoste).

He was awarded to the Erasmus Mundus NEURASMUS master's scholarship program in neuroscience in 2012. During 2012-2014, he interned at the labs of Dr. Marc Landry (chronic pain mouse models, INSERM/CNRS, France), Dr. Olaf Strauss (RPE and bestrophin-1, Berlin Charité, Germany), and Dr. Jan Wijnholds (rAAV tropism in mouse models, NIN, Amsterdam). He received his Master's Degree in Neuroscience from the VU Amsterdam (The Netherlands), the Bordeaux University (France), and the Humboldt University (Germany).

After a short stay as an English teacher in Siem Reap, Cambodia, in 2014/2015, he continued his work first as a research analyst (2015/2016) in Dr. Jan Wijnholds laboratory, and then later as a PhD candidate at the Department of Ophthalmology, at the Leiden University Medical Center (LUMC), in Leiden under the supervision of Dr. Jan Wijnholds on rAAV vectors and CRB1/CRB2 protein functions in the retina.

In 2021, he works as a viral vector specialist at the Netherlands Center for the Clinical Advancement of Cell & Gene Therapies (NecstGen), Leiden. NecstGen helps early-stage research organizations and start-ups to enter the clinical stage by bringing together the required expertise from R&D, development, production, QA and regulatory affairs in a non-profit GMP production.

List of Publications

Buck, T.M., Wijnholds, J (2020). *Recombinant Adeno-Associated Viral Vectors(rAAV)-Vector Elements in Ocular Gene Therapy Clinical Trials and Transgene Expression and Bioactivity Assays*. Int. J. Mol. Sci., 21, 4197.

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*Quinn, P. M., ***Buck, T.M.**, Mulder, A.A., Ohonin, C., Alves, C. H., Vos, R. M., Bialecka, M., Herwaarden, T. v., van Dijk, E. H.C., Talib, M., Freund, C., Mikkers, H. M. M., Hoebe, R. C., Goumans, M.-J., Boon, C. J. F., Koster, A. J., Chuva de Sousa Lopes, S. M., Jost, C. R. and Wijnholds, J. (2019). *Human iPSC-derived retinas recapitulate the fetal CRB1 CRB2 complex formation and demonstrate that photoreceptors and Müller glia are targets of AAV5*. Stem Cell Reports, 12, 906–919. ***Authors contributed equally to this work.**

Buck, T.M., Quinn, P. M., Pellissier, L.P., Mulder, A.A., et al. (2022). *CRB1 is required for the recruitment of NOTCH1 and proper recycling by RAB11A+ vesicles in human retinal organoids*. Manuscript submitted.

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Boon, N, Alves, C.H., Mulder, A.A., Andriessen, C.A., **Buck, T.M.**, Quinn, P.M.J., Vos, R.M., Koster, A.J., Jost, C.R., Wijnholds, J. (2021). *Defining Phenotype, Tropism, and Retinal Gene Therapy Using Adeno-Associated Viral Vectors (AAVs) in New-Born Brown Norway Rats with a Spontaneous Mutation in Crb1*. Int. J. Mol. Sci., 22, 3563.

Schoonderwoerd, R.A., **Buck, T.M.**, Andriessen, C.A., Wijnholds, J., Hattar, S., Meijer, J.H., DeBoer, T. (2021). *Sleep deprivation does not change the flash electroretinogram in wildtype and Opn4^{-/-} Gnat1^{-/-} mice*. J. Biol. Rhythms 37, 216-221.