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Mechanisms controlling mRNA processing and translation: decoding the regulatory layers defining gene expression through RNA sequencing

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CURRICULUM VITAE

Eleonora de Klerk was born in Catania, Italy, on July 29th, 1983. She attended Enrico Boggio Lera Scientific-Linguistic Lyceum, and graduated cum laude in the summer of 2002. After finishing her high school, she started a Bachelor program in Biological Sciences at the University of Catania, and graduated cum laude in 2006. As part of her Bachelor study, she spent 6 months at the Human Genetics Laboratory of the Vittorio Emanuele Hospital in Catania, under the supervision of dr. Angela Ragusa. Her project focused on the clinical application of quantitative fluorescence PCR for rapid prenatal detection of common chromosome aneuploidies, based on short tandem repeats analysis.

In 2006 she began a Master of Cellular and Molecular Biology at the same university. During her Master, she spent 9 months in the Molecular Biology Laboratory of the Chemistry Department at the University of Catania, under the supervision of prof. Vito De Pinto and dr. Angela Messina. Her internship focused on porin ion channels located on the outer mitochondrial membrane, and the functional role of the N-terminal segment of these proteins in the open and closed state of the channel. In summer 2009 she obtained her Master cum laude, and received a short-term scholarship for visiting other European laboratories.

In September 2009 she moved to the Netherlands and, with her scholarship, visited the Leiden Genome Technology Center (LGTC), a sequencing facility of the Human Genetics Department at the Leiden University Medical Center (LUMC). In January 2010 she began to work as research analyst at the LGTC, focusing on Next Generation Sequencing.

She began her PhD in November 2010, at the Human Genetics Department in LUMC, under the supervision of prof. Johan den Dunnen and dr. Peter-Bram 't Hoen. Since the start of her PhD, she investigated regulatory mechanisms of gene expression based on a diverse set of high-throughput RNA sequencing technologies, and the results of her work are presented in this thesis.

Her work was presented at many international conferences, including RNA Society, European Molecular Biology Organization (EMBO), European Neuromuscular International Centre (ENMC), American Society and International Conference of Human Genetics (ASHG/ICHG), and European Society of Human Genetics (ESHG), where she was candidate for Young Investigator Awards in 2012.

From December 2014 until July 2015, while finishing her PhD thesis, she joined the group of prof. Silvère van der Maarel and Lucia Clemens-Daxinger.

During her PhD, she has been actively involved in education with supervision of Bachelor and Master students, and teaching (Basic RNA-seq data analysis course, Frontiers of Science course for Master students Biomedical Sciences, Next Generation Sequencing course Avans Hogeschool, PhD student course in Molecular Neurobiology). She also enjoyed organizing scientific events for fellow PhD students, such as the organization of the MGC-PhD Workshop 2013 (Medisch Genetisch Centrum Zuid-West Nederland) in Luxembourg.

From fall 2015, Eleonora will start her training as postdoctoral fellow in dr. Michael McManus's laboratory at the University of California San Francisco (UCSF).

LIST OF PUBLICATIONS

de Klerk E., Fokkema I.F.A.C., Thiadens K.A.M.H., Goeman J.J., Palmblad M., den Dunnen J.T., von Lindern M., 't Hoen A.C. Assessing the translational landscape of myogenic differentiation by ribosome profiling. *Nucleic Acids Research*. 2015

de Klerk E., 't Hoen P.A. Alternative mRNA transcription, processing and translation: insights from RNA-sequencing. *Trends in Genetics*. 2015

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Zhernakova D.V., **de Klerk E.**, Westra H.J., Mastrokolias A., Amini S., Ariyurek Y., Jansen R., Penninx B.W., Hottenga J.J., Willemsen G., de Geus E.J., Boomsma D.I., Veldink J.H., van den Berg L.H., Wijmenga C., den Dunnen J.T., van Ommen G.J., 't Hoen P.A., Franke L. DeepSAGE reveals genetic variants associated with alternative polyadenylation and expression of coding and non-coding transcripts. *PLoS Genetics*. 2013

de Klerk E., Venema A., Anvar S.Y., Goeman J.J., Hu O., den Dunnen J.T., van der Maarel S.M., Raz V. and 't Hoen P.A. Poly(A) binding protein nuclear 1 levels affect alternative polyadenylation. *Nucleic Acids Research*. 2012

Anvar S.Y., **de Klerk E.**, Vermaat M., den Dunnen J.T., Turner S.W., 't Hoen P.A. Full-length mRNA sequencing uncovers a widespread coupling between transcription and mRNA processing. (submitted)

Thiadens K.A.M.H., **de Klerk E.**, Fokkema I.F.A.C., 't Hoen A.C., von Lindern M. Ribosome Profiling uncovers the role of uORFs in translational control of gene expression during erythroblast differentiation (in preparation)

