

CURRICULUM VITAE

Alexander Koch



Personal information

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Research statement

My research has been focused on the role of epigenetic aberrations in the development of human cancer and the utilization of these epigenetic changes as diagnostic, prognostic and predictive biomarkers. To this end, I have been working on the integration, analysis and visualization of large scale cancer (epi)genomics datasets, as well as the development of open source data visualization tools that empower other researchers in their own data exploration. In the future, I aim to expand the focus on individual markers to a more holistic approach whereby various types of (epi)genomic data and existing knowledge bases are integrated in the context of gene regulatory networks. Accurately modeling the molecular origins of diseases such as cancer would improve our understanding and could result in novel therapeutic targets.

Research experience

Jan 2020 **Senior Computational Biology Scientist**
now Identification and development of epigenetic biomarkers for early cancer detection
[Epify BV](#)

Senior Bioinformatics Consultant
[Biolizard](#)

Dec 2015 **Postdoctoral researcher**
Dec 2019 Discovery and functional characterization of epigenetic biomarkers in cancer; visualization of cancer genomics data
Department of Pathology, Maastricht University (Maastricht, the Netherlands)

Feb 2011 **PhD student**
Oct 2015 Thesis: “Different approaches to measuring gene expression and DNA methylation and their application in cancer research”
Lab of bioinformatics and computational genomics, Ghent University (Ghent, Belgium)
+ visiting trainee at the Baylin lab, Johns Hopkins University School of Medicine (Baltimore, USA; Aug – Oct 2011 & June – Sep 2012)
+ visiting trainee at the Fenyö lab, New York University (New York, USA; Oct – Dec 2014).

Education & other experience

Feb 2011 **PhD student**
Oct 2015 Ghent University + Johns Hopkins University School of Medicine + New York University

Jul 2009 **Belgian national rowing team**
Sep 2010 Raced at three world cup races and the European championships.

Sep 2004 **BSc and MSc degree in bioscience engineering, biotechnology**
Jun 2009 Thesis: “Genetic modification of bamboo”
Ghent University
+ international student at University of Natural Resources and Applied Life Sciences (Vienna, Austria; fall semester of 2008).

2001 Finalist in the Flemish Mathematics Olympiad

Publications

ORCID

<https://orcid.org/0000-0002-9804-7602>

GOOGLE SCHOLAR

<https://scholar.google.be/citations?user=OfCcGvQAAAAJ>

FIRST AUTHOR

Koch A, Jeschke J, Van Criekinge W, van Engeland M, De Meyer T. MEXPRESS update 2019. *Nucleic Acids Research* 2019

Koch A*, Joosten SC*, Feng Z, de Ruijter TC, Draht MX, Melotte V, Smits KM, Veeck J, Herman JG, Van Neste L, Van Criekinge W, De Meyer T, van Engeland M. Analysis of DNA methylation in cancer: location revisited. *Nature Reviews Clinical Oncology* 2018

Seremet T*, **Koch A***, Jansen Y, Schreuer M, Wilgenhof S, Del Marmol V, Liènard D, Thielemans K, Schats K, Kockx M, Van Criekinge W, Coulie PG, De Meyer T, van Baren N, Neyns B. Molecular and epigenetic features of melanomas and tumor immune microenvironment linked to durable remission to ipilimumab-based immunotherapy in metastatic patients. *J Transl Med* 2016, 14(1): 232

Koch A, De Meyer T, Jeschke J, Van Criekinge W. MEXPRESS: visualizing expression, DNA methylation and clinical TCGA data. *BMC Genomics* 2015, 16: 636

Koch A, Gawron D, Steyaert S, Ndah E, Crappé J, De Keulenaer S, De Meester E, Ma M, Shen B, Gevaert K, Van Criekinge W, Van Damme P, Menschaert G. A proteogenomics approach integrating proteomics and ribosome profiling increases the efficiency of protein identification and enables the discovery of alternative translation start sites. *Proteomics* 2014, 14(23–24): 2688–2698

Wrangle J*, Wang W*, **Koch A***, Easwaran H, Mohammad HP, Vendetti F, Vancrickinge W, Demeyer T, Du Z, Parsana P, Rodgers K, Yen RW, Zahnow CA, Taube JM, Brahmer JR, Tykodi SS, Easton K, Carvajal RD, Jones PA, Baylin SB. Alterations of immune response of non-small lung cancer with azacytidine. *Oncotarget* 2013, 4(11): 2067–2079

CONTRIBUTING AUTHOR

Mackens S, Santos-Ribeiro S, Racca A, Daneels D, **Koch A**, Essahib W, Verpoest W, Bourgain C, Van Riet I, Tournaye H, Brosens JJ, Lee YH, Blockeel C, Van de Velde H. The proliferative phase endometrium in IVF/ICSI: an in-cycle molecular analysis predictive of the outcome following fresh embryo transfer. *Human Reproduction* 2020

Joosten SC, Smits KM, Aarts MJ, Melotte V, **Koch A**, Tjan-Heijnen VC, van Engeland M. Epigenetics in renal cell cancer: mechanisms and clinical applications. *Nature Reviews Urology* 2018

Draht MX, Goudkade D, **Koch A**, Grabsch HI, Weijenberg MP, van Engeland M, Melotte V, Smits KM. Prognostic DNA methylation markers for sporadic colorectal cancer: a systematic review. *Clinical Epigenetics* 2018, 10: 35

Vaes N, Schonkeren SL, Brosens E, **Koch A**, McCann CJ, Thapar N, Hofstra RMW, van Engeland M, Melotte V. A combined literature and in silico analysis enlightens the role of the NDRG family in the gut. *BBA* 2018, 1862(10): 2140–2151

Jeschke J, Bizet M, Desmedt C, Calonne E, Dedeurwaerder S, Garaud S, **Koch A**, Larsimont D, Salgado R, Van den Eynden G, Gallo KW, Bontempi G, Defrance M, Sotiriou C, Fuks F. DNA methylation-based immune response signature improves patient diagnosis in multiple cancers. *Journal of Clinical Investigation* 2017, 127(8): 3090–3102

Rademakers G, Vaes N, Schonkeren SL, **Koch A**, Sharkey KA, Melotte V. The role of enteric neurons in the development and progression of colorectal cancer. *BBA* 1868(2): 420–434

Crappé J, Ndah E, **Koch A**, Steyaert S, Gawron D, De Keulenaer S, De Meester E, De Meyer T, Van Criekinge W, Van Damme P, Menschaert G. PROTEOFORMER: deep proteome coverage through ribosome profiling and MS integration. *Nucleic acids research* 2015, 43(5): e29

Menschaert G, Van Criekinge W, Notelaers T, **Koch A**, Crappé J, Gevaert K, Van Damme P. Deep proteome coverage based on ribosome profiling aids mass spectrometry-based protein and peptide discovery and provides evidence of alternative translation products and near-cognate translation initiation events. *Molecular & cellular proteomics* 2013, 12(7): 1780–1790

Jeschke J, Van Neste L, Glöckner SC, Dhir M, Calmon MF, Derogowski V, Van Criekinge W, Vlassenbroeck I, **Koch A**, Chan TA, Cope L, Hooker CM, Schuebel KE, Gabrielson E, Winterpacht A, Baylin SB, Herman JG, Ahuja N. Biomarkers for detection and prognosis of breast cancer identified by a functional hypermethylome screen. *Epigenetics* 2012, 7(7): 701–709

* these authors contributed equally

Conferences

- 2020 Invited for the Dagstuhl seminar “Visualization of Biological Data – from analysis to communication”
- 2018 1st Belgian Dataviz meetup, Brussels (Belgium) – talk: *How did I get here? My data viz journey*
AACR, Chicago (USA) – poster
IEEE VIS, Berlin (Germany) – poster
GROW Science Day, Maastricht (the Netherlands) – talk: *The human cancer DNA methylation marker atlas*
- 2017 ECEC, Heidelberg (Germany) – poster
- 2016 IEEE Vis, Baltimore (USA) – poster
byteMAL, Maastricht (the Netherlands) – poster
- 2015 BeNeMEET, Antwerp (Belgium) – talk: *Epigenetic profiling of melanoma*.
- 2013 ASMS, Minneapolis (USA) – poster
- 2013 euMEET, Brussels (Belgium) – talk: *CTLA-4 blockade and dendritic cell therapy in advanced melanoma: DNA methylation profiling*.

Peer reviewing

Peer-reviewed articles for the following journals:

- Plos ONE
- BMC Genomics
- Cancers
- Epigenetics & Chromatin

Teaching experience

- 2018*
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now Writing about and demonstrating various aspects and examples of data visualization on my personal blog (alexanderkoch.be/blog).
- 2019* Organised and taught a one-day seminar on data science and programming in R. This class was intended for the PhD students in our lab at Maastricht University who had little or no data analysis and programming background, but who were interested in analyzing their own data.
- 2015*
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2019 Guided and assisted several master's and PhD students in the computational aspects of their research.
- 2016* Gave a lecture at the pathology department on effective communication, both in scientific presentations and in data visualization, including a section on uncertainty in statistical analyses.

Skills

- research* Visualization, integration and analysis of (epi)genomic cancer data. Biomarker discovery & development. Strong writing and communication skills.
- tech* *daily use* R, Python, MySQL, JavaScript, HTML, CSS
familiar with bash & linux OS, d3.js, Adobe Creative Suite, PHP
learning about NLP, machine & deep learning, networks, graphs & NoSQL
- languages* Dutch > English > French == German

Other interests

- data viz* alexanderkoch.be/blog
Active member of the Dataviz Belgium Meetup
- sports* Multiple national rowing champion; former member of the junior, U23 and senior national rowing teams. Running. Cycling.

photography walkingaround.be

web design alexanderkoch.be

theatre Played in three productions by the American Theatre Company (Brussels)

References

Prof. **Manon van Engeland**

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Prof. **Wim Van Criekinge**

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