# **Daniel J M Crouch**

# **Employment**

Associate Director, GSK, Stevenage - Genomic Technologies, Human Genetics and Genomics. - Leveraging genomic data for gene-target identification.	2024-present
Senior Statistical Programmer (senior postdoc), Wellcome Centre for Human Ge of Oxford	enetics, University 2018-2024
-Data analysis and methods design to determine the influence of environ on Type I Diabetes when there are genetic ancestry confounders, using -Assessing the impact on rare de novo variants on Type I Diabetes. -GWAS and fine mapping for Type I Diabetes. -Various data analyses for Type I Diabetes research projects.	nmental factors I UK Biobank.
Senior Postdoctoral Fellow, Department of Oncology, University of Oxford	2014-2018
-Worked primarily on GWAS mapping of 3-dimensional facial features, including both method design and data analysis. -Also completed some theoretical analysis of effects of linkage disequilibrium on selectior when genetic drift is acting, and how this relates to sex and recombination.	
Postdoctoral Fellow, University of Oxford	2012-2014
-First stages of research on genetics of facial features	
Research Associate (temporary), King's College London	2011
-Implementation of a disease risk prediction algorithm into an R packag	е

## **Research interests**

Statistical methodology, genomewide association studies (GWAS), Mendelian Randomisation, population genetics, heritability analysis, evolutionary theory

## **Publications**

Genetic Epidemiology (2025). Bayesian effect size ranking to prioritise genetic risk variants in common diseases for follow-up studies.

**Daniel JM Crouch**, Jamie RJ Inshaw, Catherine C Robertson, Esther Ng, Jia-Yuan Zhang, Wei-Min Chen, Suna Onengut-Gumuscu, Antony J Cutler, Linda S Wicker, Carlo Sidore, Francesco Cucca, Stephen S Rich, John A Todd

PNAS (2025). The False Evidence Rate: an approach to frequentist error rate control conditioning on the observed P-value **Daniel JM Crouch** 

medRxiv (2024). Identification of novel type 1 and type 2 diabetes genes by co-localization of human islet eQTL and GWAS variants with colocRedRibbon

Anthony Piron, Florian Szymczak, Lise Folon, **Daniel J. M. Crouch**, Theodora Papadopoulou, Maria Inês Alvelos, Maikel L. Colli, Xiaoyan Yi, Marcin Pekalski, Type 2 Diabetes Global Genomics Initiative, Matthieu Defrance, John A. Todd, Décio L. Eizirik, Josep M. Mercader, Miriam Cnop

Academia Biology (2024). Evolution by Natural Selection is a scientific law and not just a theory. **Daniel JM Crouch**, Walter F Bodmer.

Genome Biology (2022). Genetic regulation of RNA splicing in human pancreatic islets. Goutham Atla, Silvia Bonàs-Guarch, Mirabai Cuenca-Ardura, Anthony Beucher, **Daniel JM Crouch**, Javier Garcia-Hurtado, Ignasi Moran, Manuel Irimia, Rashmi B Prasad, Anna L Gloyn, Lorella Marselli, Mara Suleiman, Thierry Berney, Eelco JP de Koning, Julie Kerr-Conte, Francois Pattou, John A Todd, Lorenzo Piemonti, Jorge Ferrer

Nature Communications (2022). Childhood body size directly increases type 1 diabetes risk based on a lifecourse Mendelian randomization approach.

Tom G Richardson, **Daniel JM Crouch**, Grace M Power, Fernanda Morales Berstein, Emma Hazelwood, Si Fang, Yoonsu Cho, Jamie RJ Inshaw, Catherine C Robertson, Carlo Sidore, Francesco Cucca, Steven S Rich, John A Todd, George Davey Smith

Evolutionary perspectives on cancer and ageing; book chapter in New Horizons in Evolution (2021). Edited version of Bodmer & Crouch (2020). Walter F Bodmer, **Daniel JM Crouch** 

Nature Genetics (2021). Fine-mapping, trans-ancestral and genomic analyses identify causal variants, cells, genes and drug targets for type 1 diabetes.

CC Robertson, JRJ Inshaw, S Onengut-Gumuscu, WM Chen, D Flores Santa Cruz, H Yang, AJ Cutler, **DJM Crouch**, E Farber, SL Bridges Jr, JC Edberg, RP Kimberly, JH Buckner, P Deloukas, J Divers, D Dabelea, JM Lawrence, S Marcovina, AS Shah, CJ Greenbaum, MA Atkinson, PK Gregersen, JR Oksenberg, F Pociot, MJ Rewers, AK Steck, DB Dunger, Type 1 Diabetes Genetics Consortium, LS Wicker, P Concannon, JA Todd, SS Rich

Diabetologia (2021). Analysis of overlapping genetic association in type 1 and type 2 diabetes Jamie RJ Inshaw, Carlo Sidore, Francesco Cucca, M Irina Stefana, **Daniel JM Crouch**, Mark I McCarthy, Anubha Mahajan, John A Todd

Proceedings of the National Academy of Sciences (2020). Polygenic inheritance, GWAS, Polygenic Risk Scores and the search for functional variants. **Daniel JM Crouch**, Walter F Bodmer

Diabetes Care (2020). Genetic variants predisposing most strongly to type 1 diabetes diagnosed under age 7 years lie near candidate genes that function in the immune system and in pancreatic beta cells. JRJ Inshaw, AJ Cutler, **DJM Crouch**, LS Wicker, JA Todd

Journey of Theoretical Biology (2020). Somatic selection of poorly differentiating variant stem cell clones could be a key to human ageing. Walter F Bodmer, **Daniel JM Crouch** 

Frontiers in Immunology (2019). Chronic immune activation in systemic lupus erythematosus and the autoimmune PTPN22 Trp620 risk allele drive the expansion of FOXP3+ regulatory T cells and PD-1 expression.

Ricardo Ferreira, Xaquin Castro Dopico, Joao Oliveira, Daniel Rainbow, Jennie Hsiu Mien Yang, Sarah Todd, Mhairi McNeill, Maristella Steri, Valeria Orru, Edoardo Fiorillo, **Daniel Crouch**, Marcin Pekalski, Francesco Cucca, Timothy Ian Martin Tree, Timothy Vyse, Linda Wicker, John Todd

Proceedings of the National Academy of Sciences (2018). Genetics of the human face: identification of large effect single gene variants.

**Daniel JM Crouch**, Bruce Winney, Willem Paul Koppen, William J Christmas, Katarzyna Hutnik, Tammy Day, Devendra Meena, Abdelhamid Boumertit, Pirro Hysi, Ayrun Nessa, Tim D Spector, Josef Kittler, Walter F Bodmer

Journal of Theoretical Biology (2017). Statistical aspects of evolution under natural selection, with implications for the evolution of sexual reproduction. **Daniel JM Crouch** 

International Conference on Biometrics (2016). Extending Non-negative Matrix Factorisation to 3D Registered Data.

Willem P Koppen, William J Christmas, Daniel JM Crouch, Walter F Bodmer and Josef V Kittler

Cancer Epidemiology (2013). Incorporating non-genetic risk factors and behavioural modifications into risk prediction models for colorectal cancer. Jane M Yarnall, **Daniel JM Crouch**, Cathryn M Lewis

European Journal of Human Genetics (2013). REGENT: a risk assessment and classification algorithm for genetic and environmental factors. **Daniel JM Crouch**, Graham H M Goddard, Cathryn M Lewis

European Journal of Human Genetics (2012). Inferring separate parental admixture components in unknown DNA samples using autosomal SNPs. **Daniel JM Crouch**, Michael E Weale

*European Journal of Human Genetics (2010). Genes predict village of origin in rural Europe.* Colm O'Dushlaine, Ruth McQuillan, Michael E Weale, **Daniel JM Crouch**, Åsa Johansson, Yurii Aulchenko, Christopher S Franklin, Ozren Polašek, Christian Fuchsberger, Aiden Corvin, Andrew A Hicks, Veronique Vitart, Caroline Hayward, Sarah H Wild, Thomas Meitinger, Cornelia M van Duijn, Ulf Gyllensten, Alan F Wright, Harry Campbell, Peter P Pramstaller, Igor Rudan and James F Wilson

#### Education

PhD Statistical Genetics, King's College London

2008-2013

-Thesis: Predicting Ancestral and Biogeographic Origin from Genome-wide SNP data -Implementation of Machine Learning methods for predicting geographic ancestry from genetic SNP data

-Development of maximum likelihood and Bayesian models for predicting complex admixture components and geostatistical prediction of coordinates of origin -Developed an R package implementing aspects of this work

MSc Genetic Epidemiology, University of Sheffield

2006-2007

-Thesis: Probability of Polymorphism under Natural Selection.

-Research project involved simulation of multi-allele gene populations using C++ in order to determine the rates of occurrence of stable equilibria

BSc Genetics, University of Sheffield	2003-2006
George Abbot School	1996-2003

#### Research skills

- o Computing: R programming, LaTeX, Git / Github, Bash
- Statistical method and algorithm design
- o Clinical trials experience

#### Awards

- Early career speaker bursary, Fisher Memorial Trust (2018)
- Cancer Research Student Bursary (2006)

#### **Teaching**

- DPhil Genomic Medicine and Statistics (GMS), Oxford (2019 to present)
  -Statistical models for polygenic traits
- Tutor in Human Sciences (Oxford, 2013-2017)
  - -First year Quantitative Methods (statistics)
  - -First year Genetics and Evolution
  - -Second year Human Genetics
- o Prospective Human Sciences undergraduate interviews (Magdalen College Oxford, 2014)

#### **Supervision**

- o DPhil co-supervision, Oxford
  - -Jia-Yuan Zhang (2019-2023, completed -Jamie Inshaw (2018-2020, completed) -Devendra Meena (2014-2018, completed)

#### **Management**

- o Candidate interviews at Wellcome Centre for Human Genetics (2019)
- JDRF/Wellcome Diabetes and Inflammation Lab Steering Group (Oxford, 2018-2022)
  Steering group members meet monthly to discuss core aims of the lab programme and how they can be achieved
- Day to day management of the People of the British Isles lab (Oxford, 2014-2018)
  Overseeing the curation and storage of the People of the British Isles samples and database, and facilitating collaborations with external researchers

# Public Engagement

- Main source for *New Scientist* article "Anonymised genomes cannot be linked to faces as previously claimed" (17th November 2021)
- o Guest on The Insight science podcast, episode on human facial genetics (2020)
- o 'The genetics of human facial features', article for Lost Cousins genealogical newsletter (2017)
- Engaging study participants as part of regular DNA and phenotype collection events for the People of the British Isles project, plus various museum and science festival events (2012-2018)

# Professional memberships

• Adelphi Genetics Forum (Life Fellow)