CURRICULUM VITAE

Andrea Beate Doeschl-Wilson

Andrea B. Doeschl-Wilson Professor in Infectious Disease Genetics and Mathematical Modelling The Roslin Institute and R(D)SVS, University of Edinburgh Easter Bush, EH25 9RG Email: andrea.wilson@roslin.ed.ac.uk Phone: 0131 651 9224 Mobile: +44 7910471174

RESEARCH FOCUS

Farmed Animal Health Genetics & Genomics

Mathematical modelling and analyses of infection processes in genetically diverse populations

Development of computational tools for estimating and improving host genetic resistance, tolerance and resilience to infectious pathogens and other stressors through genomics and bio-technology

EMPLOYMENT

2022-24: KSLA-Wallenberg Guest Professor in genetic epidemiology, Swedish University or Agricultural Sciences (part-time)

- 2011 now The Roslin Institute and R(D)SVS, University of Edinburgh: *Group Leader* 2018: *Personal Chair in Infectious disease genetics and modelling (grade UE10)*
 - 2016: Reader (grade UE09)
 - 2013: Group Leader
 - 2011: Career Track Fellow

2006–2011	Scottish Agricultural College: Research Scientist
2002-2006	Genus (former Sygen) / PIC
	Research Scientist: Development of selection and performance testing strategies
1998-2001	Department of Applied Mathematics, University of Western Ontario, Canada
	Teaching assistant.
1997-1998	MAS - Mathematische Analysen und Systeme, Regensburg, Germany Software developer and mathematical analyst for paper factory logistics

EDUCATION

1998-2002Department of Applied Mathematics, University of Western Ontario, CanadaPhD. Dissertation title: Assessing braided river dynamics with a cellular model.

1991-1997Department of Mathematics, University of Regensburg, GermanyMSc in Mathematics (Theoretical Physics as second subject). Thesis title: Discrete
observability of linear and non-linear dynamical systems

1993-1994 Department of Mathematics, University of Tasmania, Australia . *Graduate Courses in Mathematics and Physics*

ACADEMIC LEADERSHIP AND AWARDS

2022-2024	KSLA-Wallenberg Guest Professorship at the Swedish University of Agricultural
	Sciences: Fusing genetics and epidemiology to reduce the spread infectious diseases.
	Swedish Government KSLA-Wallenberg funds. 1,139,000 SEK.
2022-2028	Leader of the Roslin Institute Strategic Programme ISP2: Prevention and control of
	infectious diseases, £8 Million.
2019-21	Head of the Genetics and Genomics division, The Roslin Institute
Jan 2021	Lead Organiser of the online symposium in the honour John Woolliams, January 27th
	2021. Over 750 registered participants, >350 attendees of life sessions
Nov 2019	Lead Organiser and host of the BBSRC Cross Institute workshop on "The Future Role
	of Livestock in Food Production"; The Roslin Institute
2018-2019	Deputy Head of the Genetics and Genomics division, The Roslin Institute
2018–2023	Workpackage co-Leader and member of the executive committee of EU-Horizon2020 project SMARTER
2018–now	Executive member University of Edinburgh Centre for Statistics
2018	Host and convenor of the SAPHIR and VET-VAC workshop, Roslin, UK, May 2018.
2015–2019	Workpackage Leader and member of the executive committee of EU-Horizon2020 project SAPHIR
2013-2017	Co-convenor of the Roslin Institute Strategic Programme (ISP) 1: Analysis and prediction in complex animal systems
2012	EAAP conference session organiser and chair: PRRS eradiation or control: what needs to be done?
2011	Organiser and convenor of the PRRS Modelling workshop, Roslin, UK, January 2011.
	Funded by EU Cost Action F902. http://www.foodsecurity.ac.uk/research/current/pig-
	disease.html
2007–2011	Workpackage Leader and member of the executive committee of EU-FP6 project QPorkchains

RESEARCH GRANTS

Externally funded, last 10 years, over £10K only:

- 2025-2028 What makes a super-spreader? BBSRC Responsive Mode Grant. Co-I. Project value £1,600,711. £336,256.49 to Roslin
- 2025-2029 Drivers of Salmon Robustness. BBSRC Business and Academia Prosperity Partnership Award. Co-I & Pillar lead. Project value £7.149Mio, £3.814 Mio to Roslin
- 2025-2029 EUAqua.Org Integrative breeding strategies for the transition of EUropean AQUAculture towards sustainable ORGanic production. European Commission

	HORIZON-CL6-2024-BIODIV-01-9 grant, project ID 101181589. Total budget:
	€2,999,312.25; €298,430.00 to Roslin
2024-2028	Breeding dairy cattle for increased resilience and health. Roslin Foundation PhD
	studentship. PI. £233,318.
2024-2025	AI-PigNet: The AI of social interactions for next gen smart animal breeding. UKRI
2022 2024.	International Fathering Award Flus. BD/15/569//1 Fl. 25/2,407.
2025-2024:	priming award. PI. £25,000
2023-28	BBSRC Institute Strategic Programme Grant: Prevention & Control of Infectious
	Diseases. BB/X010937/1 Prevention & Control of Infectious Diseases. PI. £8,022,405
2023-28	BBSRC Institute Strategic Programme Grant: BB/X010945/1 Genes & Traits for
	Healthy Animals. Co-I £8,735,674
2023-27	ECO-READY- Achieving Ecological Resilient Dynamisms for the European food
	system through consumer-driven policies, socio-ecological challenges, biodiversity,
	near and a movement No101084201. Realin PL £170.214.40
2022	PRSPC Elavible Telent Mobility Award 4: A software for estimating host genetic
2022	contributions to infectious disease transmission model extension and validation. DI
	\pm 14,112.
2022-25	BBSRC Transforming UK Food Systems call: TRADE- TRAnsforming the DEbate
	about livestock systems transformation. BB/W018152/1 (Co-I, Roslin PI, WP leader)
	£833,381
2023	BBSRC Impact Accelerator Award: New social phenotypes from automated computer
	vision systems for reducing harmful social interactions and disease transmission in pigs
	through selective breeding. [BBSRC IAA PIII108 & AWF_2022_04_AD]. PI. £54,900.
2022-24	BBSRC Singapore - Malaysia - UK Partnering Award: Genetic innovations to support
	sustainable tropical aquaculture. Co-I. (PI: D. Robledo) BB/W018527/1. £30,000.
2022	Data Driven Innovation Scottish Funding Council: Development of Covid-19 Track
• • • •	Scotland mobile phone app. Pl., £25,500.
2022	BBSRC Flexible Talent Mobility Award : Investigation of new social phenotypes for
	reducing aggression and improving feed efficiency in pigs through selective breeding.
2021 2023	P1. £10,099. Norwagian Research Council: NOLice NOvel tools for a future with NO lice in
2021-2023	Norwegian acuaculture, Co. J. PI: Nick Robinson, Total Project hudget: 14 913 000
	NOR £250 000 to Roslin
2021 - 2025	USDA-NSF-NIH-BBSRC-BSF-NNSFC Ecology and Evolution of Infectious Diseases
	program. US-UK Collab: Combined influence of imperfect vaccines, host genetics and
	non-genetic drivers on virus transmission and virulence evolution. UK PI. US PI: Dr. J.
	Dunn. Total project budget: £3.1 Mio, £1,75 Mio to Roslin.
2020-2021	Data Driven Innovation Scottish Funding Council Beacon Programme: Data-driven
	estimates and forward predictions of COVID-19 prevalence and associated health-care
	resource requirements in Edinburgh and South-East Scotland. PI. £107,200.0
2020	BBSRC Flexible Talent Mobility Award: Determining genetic effects underlying group-
	level aggression in pigs to improve animal welfare and productivity. PI. £13,300.0

- 2020 2023 USDA-NIFA. Integration of biological models in genomic evaluations: pig-growthmodel whole genome prediction (PGM-WGP). Co-I (Roslin PI). PI: Prof. Jack Dekkers (US). £71, 850.0 to Roslin.
- 2020 2024 AHDB PhD studentship: Breeding cattle for reduced bTB transmission. PI. £73,941.
- 2019 2023 USDA-NSF-NIH-BBSRC-BSF-NNSFC Ecology and Evolution of Infectious Diseases program. US-UK Collab: Drivers of diversity and transmission of co-circulating viral lineages in host meta-populations. Co-I. PI: Dr. Kim Van der Waal. \$2,395,000 total budget, £472,321.0 to Roslin.
- 2019–2021 BBSRC 18Alert:Large memory HPC infrastructure to underpin world-class biological research. (BB/S019367/1). Co-I. PI: Andy Law, The Roslin Institute. £600,000.0
- 2019–2021 Alberta Applied Agricultural Genomics Program (A3GP). Investigating infectiousness of pigs selected for multi-factorial resilience or increased resistance to PRRS. Co-PI with Prof. G. Plastow, University of Alberta. CAD 250,000; CAD 50,000 to Roslin.
- 2018–2019 ISCF Transforming Food Production Seeding Award. Catalysing disease eradication in farm animals through gene editing: a feasibility study. PI. £27,000.0
- 2018- 2022 BBSRC-NERC aquaculture call. ROBUST-SMOLT: Impact of early life history in freshwater recirculation aquaculture systems on Atlantic salmon robustness and susceptibility to disease at sea. Co-I and WP leader. PI: H. Mignaud (University of Stirling). Total project budget £1.2 Mio, £256,000.0 to Roslin.
- 2018-2022 BBSRC Global Challenges Research Fund Strategic Training Awards for Research Skills (GCRF-STARS). Increasing research skills and capacity to support the implementation of national livestock development plans in sub-Saharan Africa.. Co-I. PI: Prof. A. Djikeng. Total project budget £224,100.0. £100,000.0 to Roslin
- 2018-2023 EU Horizon 2020 collaborative project SMARTER: SMAll RuminanTs breeding for Efficiency and Resilience. (Grant agreement ID 772787). Workpackage Leader. PI: C. Moreno, INRA (France). Total project budget: €7,643,751, €490,000.0 to Roslin.
- 2018- 2021 Norwegian research council, Innovation project for the industrial sector. ISA resistance in Atlantic salmon: Defining new phenotypes for accurate breeding. Co-I (Roslin PI). PI: B. Hillestad (SalmoBreed). Total project budget: £690K (8 Mio NK), £94,500 (1.1Mio NK) to Roslin
- 2016-2022 Scottish Government Programmes of Research 2016-22: Inferring genetic and individual variation in population and dynamic models., Strategic Research Programme RD 3 2 2 –Disease mechanisms. Co-I (Roslin PI). PI: D. Griffith, Moredun Research Institute. £756,000.0 to Roslin.
- 2016-2020 USDA Department of Agriculture and Fisheries: The role of host genetic resistance and vaccination on transmission of Marek's disease virus in poultry. AFRI Animal Health and Disease SF424. Contractor (Roslin PI). PI: J. Dunn, Total project budget USD \$499,924, USD \$147,671 to Roslin.
- 2016-2019 Teasgasc PhD Walsh Fellowship programme: Balancing short and long term aggression to maximise welfare and productivity. Co-I (Roslin PI). PI: S. Turner (SRUC). (£72,150)
- 2015-2018 Genome Alberta (ALGP2 programme). Improving Canadian pork industry profits and export potential by developing genomic tools to enhance health, performance and

	disease resilience in wean to finish pigs. Co-Investigator (Roslin PI). (Project PI: G.
	Plastow & B. Kemp). Total project budget: CDN\$499,000. CDN\$ 60,000 to Roslin
2015-2018	Norwegian Research Council Estimating genetic parameters and epidemiological effects
	for infectious disease in Atlantic salmon. Co-I (Roslin PI), (PI: M. Lillehammer,
	Nofima). £34,765 to Roslin.
2015-2019	EU Horizon 2020 collaborative project SAPHIR: Strengthening Animal Production and
	Health Through the Immune Response. Workpackage Leader (UED PI) (PI: I. Schwartz,
	INRA, France). (€9 million in total, €759,479 to Roslin)
2014-2019	EU FP7 (KBBE-KBBE-7-613611) collaborative project. FISHBOOST: Improving
	European aquaculture by advancing selective breeding to the next level for the six main
	finfish species. Co-Investigator. (PI: A. Sorenson, Nofima, Norway). (€6 million in
	total, €533,043 for Roslin)
2013-2017	USDA Animal Health Research grant: Genetically improving resistance of pigs to
	PRRS Virus infection. Co-Investigator (Roslin PI). (Project PI: J. Dekkers, Iowa State
	University USA). (£54,472 to Roslin)
2012-2016	BBSRC Industrial CASE PhD studentship: Should we aim for genetic improvement of
	host resistance or tolerance to infectious disease. PI. Industry partner: Genus. Genus.
	(£92,173)

PUBLICATIONS

REFEREED JOURNAL ARTICLES (last 10 years only; total nr of peer reviewed articles:>100)

Pamornchainavakul N., Paploski I., Makau D., Baker J., Jing H, Ferreira J., Corzo C., Rovira A., Cheeran M., Lycett S, **Doeschl-Wilson A**., Schroeder D, & VanderWaal K. 2025. Experimental evidence of vaccine-driven evolution of PRRSV-2. Virus Evolution. Under review

Toral F; Gouveia G; Ribeiro VM; Moraes M; Souza MV; Cardoso E; Gonçalves D; Anacleto O; Riggio V & **Doeschl-Wilson A.** Coinfection affects the phenotypic but not genetic resistance of cattle to common parasites. 2025 GSE. Under Review

Tollervey M, Agha S, Bekaert M, Gheyas AA, Houston RD, **Doeschl-Wilson A**, Norris A., Migaud H., Gutierrez A., Betancor M., Impact of Freshwater Rearing on Saltwater Performance: A Genotype-Environment Interaction Study in Atlantic Salmon (Salmo salar) Aquaculture, 2025.

Hewett E, Zaragoza L, Lewis C, Houdijk J, **Doeschl-Wilson A**, Turner S. Exploring the effects of dietary lysine and tryptophan on the social behavior of pigs. Journal of Animal Science. 2025;103:skaf030. <u>https://doi.org/10.1093/jas/skaf030</u>

Oldham1E L, Camerlink I, Arnott G, **Doeschl-Wilson A**, Farish M, Turner SP. Winner–loser effects overrule aggressiveness during the early stages of contests between pigs. Under review.

Sanchez-Molano E, Mukiibi R, Riggio V, Ogwang J, Kawule L, Benda K, Beine P, Bronsvoort BM, Prendergast J, **Doeschl-Wilson AB***, Muwonge A. Genomic and health characteristics of crossbred dairy cattle in Central Uganda. Frontiers in Genetics.;16:1567910. https://doi.org/10.3389/fgene.2025.1567910* Joint last author

Pooley CM, Marion G, Prentice J, Pong-Wong R, Bishop SC, **Doeschl-Wilson A.** SIRE 2.0: a novel method for estimating polygenic host effects underlying infectious disease transmission, and analytical expressions for prediction accuracies. Genetics Selection Evolution. 2025 Apr 1;57(1):17. https://link.springer.com/article/10.1186/s12711-025-00956-4. https://github.com/theITEAM/SIRE2.0

Agha S, Psota E, Turner SP, Lewis CR, Steibel JP, **Doeschl-Wilson A**. Revealing the Hidden Social Structure of Pigs with AI-Assisted Automated Monitoring Data and Social Network Analysis. Animals.

2025 Mar 30;15(7):996. Doi: https://doi.org/10.1101/2025.01.30.635669 https://www.biorxiv.org/content/10.1101/2025.01.30.635669v1

Madenci, D., Sánchez-Molano, E., Winters, M., Mitchell, A., Coffey, M.P., Hadfield, J.D., Woolliams, J.A., Banos, G. and **Doeschl-Wilson, A.**, 2025. Detection of genetic variability in dairy cattle infectivity for bovine tuberculosis. Journal of Dairy Science. 108:3835-49. https://doi.org/10.3168/jds.2024-25697

Douhard, F., Moreno-Romieux, C. & **Doeschl-Wilson, A.B**. Inferring the energy cost of resistance to parasitic infection and its link to a trade-off. BMC Ecol Evo 25, 14 (2025). https://doi.org/10.1186/s12862-024-02340-0

Nisbet, H., Lambe, N., Miller, G. A., **Doeschl-Wilson, A.**, Barclay, D., Wheaton, A., & Duthie, C. A. (2025). Meat yields and primal cut weights from beef carcasses can be predicted with similar accuracies using in-abattoir 3D measurements or EUROP classification grade. Meat Science, 222, 109738.

Nisbet, H., Lambe, N., Miller, G., **Doeschl-Wilson, A.**, Barclay, D., Wheaton, A., & Duthie, C. A. 2024. On-farm 3D images of beef cattle for the prediction of EUROP carcass classification traits and cold carcass weight. Animal. Under Review

Tollervey MJ, Bekaert M, González AB, Agha S, Houston RD, **Doeschl-Wilson A**, Norris A, Migaud H, Gutierrez AP. Assessing genotype–environment interactions in Atlantic salmon reared in freshwater loch and recirculating systems. Evolutionary Applications. 2024 Aug;17(8):e13751.

Ghaderi-Zefreh M, Pong-Wong R, **Doeschl-Wilson A**, 2024. Validating statistical properties of resilience indicators derived from simulated longitudinal performance measures of farmed animals. *animal*, *18*(8), 101248

Nisbet, H., Lambe, N., Miller, G., **Doeschl-Wilson, A.**, Barclay, D., Wheaton, A., & Duthie, C. A. (2024). Machine learning algorithms for the prediction of EUROP classification grade and carcass weight, using 3-dimensional measurements of beef carcasses. Front. Anim. Sci. 5:1383371.doi: 10.3389/fanim.2024.1383371

Nisbet, H., Lambe, N., Miller, G., **Doeschl-Wilson, A**., Barclay, D., Wheaton, A., & Duthie, C. A. (2023). Using in-abattoir 3-dimensional measurements from images of beef carcasses for the prediction of EUROP classification grade and carcass weight. Meat Science, 109391. https://doi.org/10.1016/j.meatsci.2023.109391

Chase-Topping M., Plastow G., Dekkers J., Li Y., Fang Y., Gerdts V., van Kessel J., Harding J., Opriessnig T., **Doeschl-Wilson A**. The WUR0000125 PRRS resilience SNP had no apparent effect on pigs' infectivity and susceptibility in a novel transmission trial. Genetics Selection Evolution. 2023.55:51. https://doi.org/10.1186/s12711-023-00824-z

Taghipoor M., M Pastell, O Martin, H Nguyen Ba, J van Milgen, **A Doeschl-Wilson**, C Loncke, NC Friggens, L Puillet, R Muñoz-Tamayo, Animal Board Invited Review: Quantification of resilience in farm animals. Animal. 2023. https://doi.org/10.1016/j.animal.2023.100925

Barria Gonzalez A., Penaloza C., Papadopoulou A., Mahmuddin M, **Doeschl-Wilson A.**, Benzie J., Houston R., Wiener P., Genetic differentiation following recent domestication events: a study of farmed Nile tilapia (Oreochromis niloticus) populations. *Evolutionary Applications*. 2023; 00:1-16. DOI: 10.1111/eva.13560

Ghaderi-Zefreh M, **Doeschl-Wilson A**, Riggio V, Matika O, Pong-Wong R. Exploring the value of genomic predictions to simultaneously improve production potential and resilience of farmed animals. *Frontiers in Genetics* 2023. 023 May 12;14:1127530. <u>https://doi.org/10.3389/fgene.2023.1127530</u>

Robinson NA, Robledo D, Sveen L, ..., **Doeschl-Wilson A**,Houston R. Applying genetic technologies to combat infectious diseases in aquaculture. *Reviews in Aquaculture*. 2022 Sep 5. https://doi.org/10.1111/raq.12733

Douhard F, **Doeschl-Wilson A**, Corbishley A, Hayward AD, Marcon D, Weisbecker JL, Aguerre S, Bordes L, Jacquiet P, McNeilly TN, Sallé G. The cost of host genetic resistance on body condition: Evidence from divergently selected sheep. *Evolutionary applications*. 2022 Sep;15(9):1374-89.

Makau DN, Lycett S, Michalska-Smith M, Paploski IA, Cheeran MC, Craft ME, Kao RR, Schroeder DC, **Doeschl-Wilson A**, VanderWaal K. Ecological and evolutionary dynamics of multi-strain RNA viruses. *Nature Ecology & Evolution*. 2022 Sep 22:1-9. https://doi.org/10.1038/s41559-022-01860-6

Agha S, Turner SP, Lewis CR, Desire S, Roehe R, **Doeschl-Wilson A**. Genetic associations of novel behaviour traits derived from social network analysis with growth, feed efficiency, and carcass characteristics in pigs. *Genes.* 2022 Sep 8;13(9):1616.

Pooley, C., Marion, G., Bishop, S. and **Doeschl-Wilson**, A., 2022. Optimal experimental designs for estimating genetic and non-genetic effects underlying infectious disease transmission. *Genetics Selection Evolution*, 54(1), pp.1-22. (GSE featured article)

Agha S, Foister S, Roehe R, Turner SP, **Doeschl-Wilson A**. 2022 Genetic Analysis of Novel Behaviour Traits in Pigs Derived from Social Network Analysis. *Genes*. 2022 Mar 23;13(4):561. (Genes featured article)

Petersen, G.E.L., Buntjer, J., Hely, F., Byrne, T., Whitelaw, B. and **Doeschl-Wilson, A.** 2022. Modelling suggest gene editing combined with vaccination could eliminate a persistent disease in livestock. *PNAS* 119(9):e2017224119. DOI:10.1073/pnas.2107224119

Pooley C.M., **Doeschl-Wilson A.B.**, Marion G., 2022; Estimation of age-stratified contact rates during the COVID-19 pandemic using a novel inference algorithm. *Phil. Trans. R. Soc. A.* 3802021029820210298, http://doi.org/10.1098/rsta.2021.0298

Mucha S., Tortereau F., **Doeschl-Wilson A.**, Rupp R., Conington J. 2022. Meta-analysis of genetic parameters for resilience and efficiency traits in goats and sheep. Animal. Animal Board Invited Review. *Animal* 16.3:100456. https://doi.org/10.1016/j.animal.2022.100456

Oldham L., Arnett G., Camerlink I., **Doeschl-Wilson A**., Farish M., Wemeslfelder F. & Turner, S. 2022. Once bitten, twice shy: experience of aggression affects pigs' emotions at the start of agonistic encounters. *Appl. Anim. Behaviour Science*. 244:105488.

Neyton L, Zheng X, Skouras C, **Doeschl-Wilson A**, Gutmann MU, Uings I, Rao FV, Nicolas A, Marshall C, Wilson LM, Baillie JK. Molecular patterns in acute pancreatitis reflect generalizable endotypes of the host response to systemic injury in humans. *Annals of surgery*. 2022 Feb 27:275(2):e453-62.

Doeschl-Wilson A, Marion G, Pooley CM. New tools and insights to enable breeding for reduced disease transmission. InProceedings of 12th World Congress on Genetics Applied to Livestock Production (WCGALP) Technical and species orientated innovations in animal breeding, and contribution of genetics to solving societal challenges 2022 Dec 31 (pp. 724-727). Wageningen Academic Publishers.

Agha S, Foister S, Roehe R, Turner SP, **Doeschl-Wilson A**. Genetic parameters of novel behaviour traits derived from social network analysis in pigs. InProceedings of 12th World Congress on Genetics Applied to Livestock Production (WCGALP) Technical and species orientated innovations in animal breeding, and contribution of genetics to solving societal challenges 2022 Dec 31 (pp. 524-527). Wageningen Academic Publishers.

Prentice JC, Pooley CM, Tsairidou S, Wong RP, Anacleto O, Saura M, Bailey RI, Marion G, Villanueva B, **Doeschl-Wilson A.** Transmission experiment in turbot shows high genetic variation in host infectivity affecting disease spread and survival. In Proceedings of 12th World Congress on Genetics Applied to Livestock Production (WCGALP) Technical and species orientated innovations in animal breeding, and contribution of genetics to solving societal challenges 2022 Dec 31 (pp. 728-731). Wageningen Academic Publishers.

Sánchez-Molano E, Madenci D, Tsairidou S, Winters M, Mitchell AP, Banos G, **Doeschl-Wilson A**. Detection of genetic variability in cattle infectivity for bovine tuberculosis (bTB). InProceedings of 12th World Congress on Genetics Applied to Livestock Production (WCGALP) Technical and species

orientated innovations in animal breeding, and contribution of genetics to solving societal challenges 2022 Dec 31 (pp. 2887-2890). Wageningen Academic Publishers.

Chase-Topping ME, Plastow G, Dekkers J, Fang Y, Gerdts V, van Kessel J, Harding J, Opriessnig T, **Doeschl-Wilson A**. GBP5 PRRSV resistance gene had no effect on pigs' infectivity or susceptibility in a trial simulating natural infections. In Proceedings of 12th World Congress on Genetics Applied to Livestock Production (WCGALP) Technical and species orientated innovations in animal breeding, and contribution of genetics to solving societal challenges 2022 Dec 31 (pp. 3212-3216). Wageningen Academic Publishers.

Pooley CM, Marion G, **Doeschl-Wilson A.** SIRE 2.0: a novel software tool to estimate host genetic variation in infectious disease transmission. InProceedings of 12th World Congress on Genetics Applied to Livestock Production (WCGALP) Technical and species orientated innovations in animal breeding, and contribution of genetics to solving societal challenges 2022 Dec 31 (pp. 1475-1478). Wageningen Academic Publishers.

Frank JW, Marion G, **Doeschl-Wilson A.** 2021. A critical appraisal tool for modelling studies of the Impact of "Test, Trace and Protect" Programmes of COV.ID-19 Transmission. *Public Health*. 201:55-60. https://doi.org/10.1016/j.puhe.2021.10.003

Paploski, IAD, Pamornchainavakul N, Makau DN, Rovira A, Corzo CA, Schroeder DC, Cheeran M, **Doeschl-Wilson A**, Kao RR, Lycett S, VanderWaal K, 2021. Phylogenetic structure and sequential dominance of sub-lineages of PRRSV Type 2 Lineage 1 in the United States. *Vaccines*. 9(6),608.

Doeschl-Wilson A., Knap P., Opriessnig T., More S., 2021. Review: Livestock disease resilience: from individual to herd level. Invited Review (Europ. Assoc. Animal Prod.): Sustainable livestock systems for high-producing animals. *Animal* 15:100286. https://doi.org/10.1016/j.animal.2021.100286

Chase-Topping, M. E., Pooley, C., Moghadam, H. K., Hillestad, B., Lillehammer, M., Sveen, L., & **Doeschl-Wilson, A.** (2021). Impact of vaccination and selective breeding on the transmission of Infectious salmon anemia virus. *Aquaculture*, *535*, 736365. Top 3 most accessed article in 2021. https://doi.org/10.1016/j.aquaculture.2021.736365

Pooley C.M., Marion G., Bishop S.C., Bailey RI, **Doeschl-Wilson A.B.** 2020. Estimating individuals' genetic and non-genetic effects underlying infectious disease transmission using temporal epidemic data. *PloS Comp. Biol.* 16.12 (2020):e1008447. <u>https://doi.org/10.1371/journal.pcbi.1008447</u>

Turner SP., Weller JE, Camerlink I, Arnott G., Choi T, **Doeschl-Wilson A**, Farish M, Foister S. 2020. Play fighting network structure and individual centrality do not predict injuries from later aggression. *Sci. Rep.* 10(1), 1-16.

Callaby R, Kelly RF, Mazeri S, Sander M, Egbe FN, Ndip L, Benedictus L, Clark E, **Doeschl-Wilson** AB, Bronsvoort M, Salavati M, Muwonge A . A genomic map for resistance of Bos indicus cattle in Cameroon to bovine tuberculosis. *Front. Gene.* 2020.

Knap P. & **Doeschl-Wilson A.** 2020. Why to breed disease-resilient livestock, and how? *GenetSelEvol* 52:60. https://doi.org/10.1186/s12711-020-00580-4

Oldham L., Camerlink I., Arnott G., **Doeschl-Wilson A.**, & Turner, S. 2020. Winner-loser effects overrule aggressiveness during the early stages of contests between pigs. *Sci. Rep.* 10(1), 1-13.

Chase-Topping M., Xie J, Pooley C., Trus I., Bonckaert C., Rediger K., Brown H., Bitsouni V., Barrion B., Gueguen S., Nauwynck H.*, **Doeschl-Wilson A.B.*** 2019. New Insights about vaccine effectiveness: Results from a PRRSV transmission experiment in pigs using an attenuated PRRS strain. *Vaccine* DOI: 10.1016/j.vaccine.2020.02.015*= joint senior authors

Bailey RI, Cheng H, Chase-Topping M, Mays J, Anacleto O, Dunn JR* and **Doeschl-Wilson A**.* 2019. Transmission from vaccinated hosts can cause dose-dependent reduction in pathogen virulence. *PLoS Biol* 18(3): e3000619. https://doi.org/10.1371/journal.pbio.3000619 *= joint senior authors

Pooley C.M., Bishop S.C., **Doeschl-Wilson A.B.**, Marion G., 2019. Posterior-based proposals for speeding up Markov chain Monte Carlo. *Royal Society Open Science*. https://doi.org/10.1098/rsos.190619

Bitsouni V., Lycett S., Opriessnig T., **Doeschl-Wilson A.** 2019. Predicting vaccine effectiveness in livestock populations: a theoretical framework applied to PRRS in pigs. *PLoS One*. 2019 Aug 30;14(8):e0220738 doi.org/10.1371/journal.pone.0220738

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Doeschl-Wilson, A.B., Bishop S.C., Kyriazakis I., and Villanueva B. 2012. Novel methods for quantifying individual host response to infectious pathogens for genetic analyses. Front. Gene. 3:266. doi: 10.3389/fgene.2012.00266

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S. Bishop, **A.B. Doeschl-Wilson**, J A Woolliams, 2012. Uses and Implications of Field Disease Data for Livestock Genomic and Genetics Studies, Frontiers in Livestock Genomics. DOI=10.3389/fgene.2012.00114

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BOOKS EDITED

Animal Genetics and Diseases - Advances in Farming and Livestock Systems. Special Research Topic, Front. Gene. 2018. (eds. Fife M., Hammond JA., **Doeschl-Wilson A.B**.) <u>https://www.frontiersin.org/research-topics/6878/animal-genetics-and-diseases-advances-in-farming-and-livestock-systems</u> (148K views, January 2023)

Should we aim for genetic improvement in host resistance or tolerance to infectious pathogens? (eds. **Doeschl-Wilson A.B.** and Kyriazakis I.). Special Research Topic, Front. Gene. 2012. 3:272. doi: 10.3389/fgene.2012.00272 (90K views, January 2023)

OPEN-SOURCE SOFTWARE TOOLS

Covid-19 Tracking and Monitoring for Scotland Dashboard: https://theiteam.shinyapps.io/COVID19Scotland_TrackandModel/

Epidemiological modelling and inference: <u>https://theITEAM.github.io/</u>

- BICI Bayesian Individual-based Compartmental Inference:. https://theiteam.github.io/BICI.html Paper to be submitted
- SIRE: Software for estimating genetic and non-genetic factors determining epidemiological traits <u>https://theiteam.github.io/SIRE.html</u> (SIRE V1: <u>https://doi.org/10.1371/journal.pcbi.1008447</u>, SIRE V2: under Review)
- SIRE-PC: Experimental design software to compute statistical power for estimating genetic and non-genetic effects on epidemiological traits. <u>https://theiteam.github.io/SIRE-PC.html</u> (Paper published in Genetics, Selection & Evolution)

Interactive Prediction models for the impact of genetic selection and vaccination:

- Bitsouni et al: Vaccine effectiveness in the field – an interactive R shiny modelling app: DOI: 10.5281/zenodo.3693547 (<u>https://zenodo.org/record/3693547#.XmEo06j7Sbg</u>)

- Tsairidou et al: GenEpi V1.0 – predicting the impact of selection for host infectivity and susceptibility on disease prevalence: <u>DOI: 10.5281/zenodo.3696667</u>

SCIENTIFIC CONFERENCE PRESENTATIONS (Invited talks only, last 10 years only)

Quantitative Genetics and Genomics Gordon Research Conference, Lucca, February 2025: Why breed for reduced disease transmission, and how?

KSLA Wallenberg lecture 2024: Healthy Animals for Sustainable Agriculture and One Health. Stockholm, February 2024. Invited talk

American Dairy Science Association ADSA symposium 2023: When, why and how to breed for disease resilience in livestock? Ottawa, June 2023. Invited talk

Quantitative Genetics and Genomics Gordon Research Conference, Ventura, February 2023: Discussion group leader "Health and Welfare Traits"

Showcasing Smarter Sheep Science, Edinburgh Dec. 2022: Breeding resilient sheep. Invited talk

World Congress in Genetics Applied to Livestock Production (WCGALP) 2022: New tools and insights to enable breeding for reduced disease transmission. Invited talk

Huelsenberger Gespraeche, Hamburg 2022: Breeding for disease resistance & reduced disease transmission. Invited talk.

Pig Veterinary Society Annual Conference. Bedford UK Nov. 2021. New insights for PRRS control: Genetic control option. Invited talk

XVIII Latin American Congress of Genetics (ALAG), October 2021. Identifying genetic superspreaders. Invited talk.

Seminar series in mathematical modelling of biological systems (Sammba), Institute Pasteur, Paris. On the impact of vaccination and genetic selection on disease transmission in farm animals. May 2021. Invited talk.

Doing Data Better Conference, The Scotsman and DDI online symposium, September 2021. Datadriven now-casting and fore-casting of healthcare requirements associated with Covid-19. Invited talk

Centre for Statistics, University of Edinburgh, Research Day: Statistics in the World of Covid-19. February 2021. Insights from infectious disease studies in animal populations for Covid-19. Invited talk

Plant and Animal Genome Conference PAG, San Diego, January 2020. Modelling the feasibility of eradicating PRRS with genome editing. Invited talk

CiBreed Workshop on Breeding Challenges and Opportunities in the Realm of Biotic Stress, Goettingen, Germany September 2019: Genetic control of biotic stress in livestock: a vision for future breeding programmes. Invited talk

Pig Veterinary Society Antimicrobial discussion group, London, March 2019: Utilizing pig genetics to control infectious diseases. Invited talk.

Gordon Research Conference in Quantitative Genetics & Genomics, Italy, February 2019: Genes and the environment provided by other – hidden heritable variation. Invited talk – joint with P. Bijmer WUR.

One Health Models of Infectious Disease Workshop, Edinburgh October 2018. Statistical modelling of health trajectories. Invited talk.

European Vet-Vaccinology Workshop, Edinburgh May 2018. Mathematical Modelling in Veterinary Vacciniology. Invited talk

North American PRRS symposium. Chicago, USA, Dec 2017. Novel insights about host response to PRRS from data driven mathematical models. Invited talk.

Disease in aquaculture workshop, Universidad Autónoma de Baja California, Ensenada Mexico, October 2017. Genetic resistance and vaccination analysis on infectious disease genetics and geneticepidemiological modelling in aquatic animals. Keynote talk.

Breeding for resilience workshop, Wageningen University, NL, September 2017: Is resilience a good breeding goal to control infectious disease prevalence? Invited talk.

Genomics in Aquaculture: a new set of tools to increase sustainable production of seafood. Merida, Yucatan, Mexico, January 2017. Genetic epidemiology in aquaculture. Invited talk.

[COST] Action CA15134 Training School Relationships between damaging behaviour and health, Belgrade, Serbia. November 2016. Invited talk

35th International Society for Animal Genetics Conference (ISAG), Salt Lake City, Utah, USA, July 2016. Mathematical models of host-pathogen interactions. Plenary talk

CIDCATS symposium 'Interdisciplinary approaches to combating infectious diseases', December 2015. The genomic warfare on infectious diseases in livestock. Invited talk

Norwegian Animal Breeding Conference, Oslo, Norway, December 2015: Combining genetics & epidemiology to combat infectious disease in livestock. Invited talk

Complex Systems Digital Campus World e-conference "From Molecules to organisms and the ecosystems", September 2015. Unmasking the contribution of host genetics to infectious disease outbreaks. Invited talk

MIHMES Plenary Meeting, Nantes, France, January 2015. Statistical & Mechanistic Models of PRRS infection dynamics. Keynote presentation

Breeding Focus 2014 - Improving Resilience, University of Armidale, Australia, October 2014: Inferring genetic resilience of animals to infectious pathogens – opportunities and pitfalls. Invited talk

World Congress in Quantitative Genetics Applied to Livestock Production, Vancouver, Canada, August 2014: New Methods for capturing unidentified genetic Variation underlying Infectious Disease in Livestock Populations. Invited talk

Beyond killing: new ways to manage infection, Centre of Infection, Immunity and Evolution Winter symposium, Edinburgh, December 2013: Resistance and tolerance – can we exploit them to conquer infections? Invited talk

Genetics of social life: agriculture meets evolutionary biology, Wageningen University, NL, May 2013: Indirect genetics effects and infectious disease. Invited talk Gordon Research Conference in Quantitative Genetics & Genomics, Galveston Island, Texas, February 2013: Vive la rèsistance? Exploiting host genetic defences to conquer infections. Invited talk

TEACHING (last 5 years only)

2023	Coordinator and lecturer of the NOVA Summer School "Understanding infectious diseases by fusing epidemiology, genetics and modelling", Sweden September 2023
2021	Lecturer of the module Breeding for disease resistance: Data-Driven Breeding and Genetics (of Animals and Plants). Online post-graduate Course, University of Edinburgh
2020-now	Lecturer in "Methods to control the spread of infectious disease in animals and humans". Post-graduate Infectious Disease and One Health course: One Health & Comparative Animal Model. University of Edinburgh
2019	Lecturer in "statistical and mathematical methods for analysing robustness" as part of the "Robustness, from a woolly concept to operational measures" course, April 2019 INRA AgroParisTech, France
2018-2019	Lecturer in "Mathematical modelling and genetic analysis of infectious disease in livestock" as part of the BBSRC Global Challenges Research Fund Strategic Training Awards for Research Skills, Addis Abeba, Ethopia, 2018; Nairobi, Kenya, 2019
2018	Lecturer of the 5 day summer school Mathematical modelling of infection dynamics in genetically diverse farm animal populations, University of New England, Armidale, Australia, January 2018
2017-2018	Online Lectures for module Impact of genetic selection on disease epidemiology and pathogen evolution. Genetic selection: from concepts to application to genetic improvement of health. Online course: Principles and Applications of Genetics and Genomics to Improve Animal Health: University of Minnesota. https://cceevents.umn.edu/principles-and-applications-of-genetics-and-genomics- improve-animal-health/
2017	Lecturer in the 5 day NOVA post-graduate course 'Genetic Epidemiology', Swedish Livestock University, Uppsala, Sweden, May 2017
2015-now	Lecturer of the "Breeding for disease resistance' module in the Quantitative Genetics and Genome analysis MSc course, University of Edinburgh

SUPERVISION AND MENTORING OF EARLY CAREER RESEARCHERS

SUPERVISION

Post-doctoral fellows: 12 (6 current; Principal supervisor)

Externally funded research fellows: 3 (Principal supervisor & host; 1 current) *PhD and MSc students:*

Current: UED PhD students: 5 (Principal supervisor: 1; Second supervisor: 4); External PhD students: 1

Previous (since 2008):

UED PhD students: 11 (Principal supervisor: 6; Second supervisor:5); all successfully graduated within allocated time period UED MSc students: 2 (Principal supervisor: 1; Second supervisor: 1) External PhD students: 5

PHD STUDENTSHIP COMMITTEE MEMBER (chair or expert advisor): 17 since 2012, 4 current

MENTORING

Mentor of 3 post-doctoral and 4 University of Edinburgh Career Track Fellows (2 current)

COMMITTEE MEMBERSHIP (last 10 years)

ROSLIN INSTITUTE & UNIVERSITY OF EDINBURGH

- 2018–now Member of the Roslin Strategic Management Group
 2018-now Member of the Roslin Institute Career Track, and University of Edinburgh Scientific Academic Track and Chancellor Fellows evaluation committee
 2015–now Member of the Roslin Scientific Management Group
- 2015-now Member of recruitment and interview panels for CTLG director, professors, group leaders, post-docs, and clinical research fellows at Roslin and R(D)SVS
- 2012-now Internal PhD student examiner (7 to date)

EXTERNAL

2024-now	Member of the Scientific Advisory Board of the INRAE DIGIT-BIO strategic programme
2023-26	Member of the scientific organising committee of the 13 th World Congress on Genetics Applied to Livestock Production
2022-2024	Member of the UK CIEL Open Innovation Animal Health & Welfare group
2019-22	Member of the scientific organising committee of the 12 th World Congress on Genetics Applied to Livestock Production
2020-21	Member of Evaluation Committees for Prof. Schmitt (Goettingen University, Germany)
	and Prof. Hermesch (University of New England, Australia)
2020-2021	Member of the Scottish Covid-19 Response Consortium.
2019-now	Member of the Wellcome Trust PhD programme in One Health Models of Disease
2018-2019	Member of the PRRS Eradication Scotland Initiative
2016-2021	Member of the scientific programme committee / session chair of the Modelling in
	Animal Health (ModAH) Conferences (June 2017 Nantes, France), 2021&2022 online
2016-2017	Member of the planning and scientific organizing committee of the inaugural Wellcome
	Trust conference in Animal Genetics and Disease (Sept 2017), Hinxton UK
2015-2022	Member of the international advisory board for the MIHMES project (ANR-10-BINF-
	07) France

2015	Member of the scientific organizing committee of the BSAS conference 'What have
	DNA-sequencing technologies ever done for the animal Sciences', Edinburgh UK
2015	Member of the international evaluation committee for the Agence Nationale de la
	Reserche (ANR) work programme- challenge 5, France
2015-now	Member of external recruitment and promotion panels for senior researchers (University
	of Agricultural Sciences, Sweden; London School of Hygiene, UK; INRAE, France etc.)
2012-now	External examiner of PhD students
	H. Nguyen-ba, INRA Rennes, France (2020)
	F. Biemans, university of Wageningen, the Netherlands (2019)
	K. Welderufael, Swedish Livestock University (SLU), Sweden (2017)
	M. Saccareaux, University of Toulouse, France (2016)
	N. Go, Institute National Reserche Agricultural (INRA AgroParis Tech), France (2014)
	K. Kemper, University of Melbourne, Australia (2012)
2012-2017	Member of the PRRS Host Genetics Consortium

EDITORSHIP

2016-now	Associate editor for Genetics, Selection, Evolution
2010–now	Scientific editor of Frontiers of Livestock Genomics

CONSULTANCIES

2019–2020	Consultant for Danish Genetics
2015-now	Scientific advisor for Genus PLC, Topigs Norsvin, Worldfish, UK Animal Agriculture
	and Horticulture Development Board, and the Animal and Plant Health Agency

PUBLIC ENGAGEMENT / ACADEMIC CITIZENSHIP (few selected only)

Roslin Reels: Infectious Disease in Livestock Facebook Bluesky LinkedIn Instagram Youtube

Host of the Gordon Research Conference Power Hour on Diversity and Inclusion. *Quantitative Genetics and Genomics Gordon Research Conference, Lucca, February 2025.*

Wallenberg lecture 2024. Healthy Animals for sustainable agriculture and One Health. The Royal Swedish Academy of Agriculture. February 2024. <u>https://www.ksla.se/aktivitet/healthy-animals-for-sustainable-agriculture-and-one-health/</u>

Showcasing Smarter Sheep Science, Farmer and Industry knowledge exchange event, Edinburgh Dec. 2022: Breeding resilient sheep. Invited talk

Initiator and Scientific Lead of the Covid-19 Tracking and Modelling for Scotland Dashboard <u>https://theiteam.shinyapps.io/COVID19Scotland_TrackandModel/</u> https://media.ed.ac.uk/media/Covid-19+Tracking+%26+Modelling+for+Scotland+dashboardA+Demo+Event/1_18s5dja7 Presenter and Panellist at the Data Driven Innovation Centre Webinar: The role of data and data innovation in the recovery from Covid-19. July 1st 2020. *Covid-19 nowcasting and forecasting*. https://media.ed.ac.uk/media/1_jee1pw6h

Panellist at the live University of Edinburgh: Changing World Conversations, COP26 event, Nov 2022. <u>https://www.youtube.com/watch?v=vFiXTAz3vbM&list=PLBcSHVMkBQZgnM7t4LFMV11oEofR2J</u> <u>1vX&index=4</u>

UKRI Climate change profile piece for Cop 26: <u>https://www.youtube.com/playlist?list=PLkjB0VcEl5P-z0nJ7oiiV-RtKIOD11wlf</u> <u>https://www.ukri.org/our-work/responding-to-climate-change/our-climate-pioneers/</u>

Panel member of the Science Media briefing event "Can We Have Our Meat and Eat It? - The Future of Meat Production" Science Media Centre London 2019:

https://www.herefordtimes.com/news/national/18063917.breeding-help-cattle-becomeenvironmentally-friendly-scientists-say/

https://www.telegraph.co.uk/science/2019/11/27/meat-crucial-feeding-planet-going-vegan-not-green-say-scientists/

Contributing scientist to the UK government bovine Tuberculosis strategy review <u>https://www.gov.uk/government/publications/a-strategy-for-achieving-bovine-tuberculosis-free-status-for-england-2018-review</u>.

https://www.animalwelfarefoundation.org.uk/news/meet-our-researchers-andrea-doeschl-wilson/