EMILIA KVARSTEIN TAYLOR

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EDUCATION

2022-2026 – University of Oxford, DPhil Chemistry in Cells
2020-2022 – AstraZeneca R&D Graduate Programme, Gothenburg, Sweden
2020-2021 – University College London, Data and Machine Learning for Biomedicine short course
2019-2020 - Imperial College London, Master of Research in Drug Discovery (MRes): Distinction
2015-2018 - University of Leeds, Bachelor of Science (BSc Hons): Medicinal Chemistry, Upper First Class Honours

RESEARCH EXPERIENCE

September 2022- September 2026 – Development of bifunctional molecule to reverse antibiotic resistance – Oxford University - Dr Thomas Lanyon-Hogg/Dr Georgia Isom/Professor Angela Russell

- Purified bacterial proteins and demonstrated protease-mediated degradation of resistant enzymes in *E. coli*
- Developed a resilient modular approach for quick PROTAC assembly through automated parallel synthesis.
- Developed biochemical assays to evaluate small-molecule activity, binding affinity, cell permeability, and protein degradation.
- Initiated and managed collaboration with AstraZeneca Sweden's proteomics facility, improving substrate profiling for bacterial proteases.

January 2022 – September 2022 – Protein ubiquitination site identification for improved PROTAC design – AstraZeneca Early Discovery Sciences - Dr Thomas Lundbäck

- Probed PROTAC ubiquitination sites on proteins using targeted mass spectrometry to guide the design of more potent degraders.

May 2021-January 2022 – Nano-PROTAC synthesis and screening using SuFEx Chemistry and automation – AstraZeneca Early CVRM Medicinal Chemistry – Dr Mateusz Plesniak

- Developed a platform for evaluating various exit vectors and linkers for nanomolar-scale PROTAC synthesis and crude reaction screening.
- Developed novel synthetic pathways for the late-stage incorporation of sulfonyl fluoride functional groups.
- Identified novel PROTACs that exhibited high potency in degrading target proteins using HiBiT and AlphaLISA assays.
- Successfully applied optimised methodology to numerous PROTAC projects within AstraZeneca, resulting in novel design sets.

Sept 2020-May 2021 - Targeting ALK7 for the treatment of Type 2 Diabetes – AstraZeneca metabolism *in vitro* - Dr David Baker

- Delivered critical data validating the use of competitor tool monoclonal antibodies to increase insulin sensitivity and improve adipocyte function.
- Proposed a new target to global cross-functional teams by gathering and presenting relevant data, leading to approval for an *in vivo* experiment.
- Generated HepG2 KO cell lines using CRISPR-Cas9 technology to validate and accelerate novel targets within the early CVRM portfolio.
- Acquired skills in qPCR, optimisation of functional assays, and protein detection techniques.
- Trained interns and conducted practical tutorials on performing Seahorse experiments to assess mitochondrial function and on culturing adipocytes *in vitro.*

2019-2020 – Small molecule inhibitors of bacterial DNA repair enzymes for the development of next generation antibiotics – Imperial College London - Professor Ed Tate/Dr Andrew Edwards

- Proposed a seven-month project based on a critical literature review
- Designed novel activity-based chemical probes to identify and validate novel antimicrobial targets.
- Designed and carried out multi-compound cellular assays
- Advanced technical skills in chemical synthetic route optimisation, HRMS, LC-MS, NMR, and global proteomic analysis.

- Gained proficiency in software such as Mestrenova and FLARE.

2017-2018 – Synthetic optimisation to recycle the undesired enantiomer of Naproxen, a non-steroidal anti-inflammatory drug – Leeds University - Dr Nimesh Mistry

- Successfully led a team by delegating tasks to develop innovative, multi-step synthetic routes for high-yielding transformations.
- Innovatively designed experimental tools to facilitate analysis.

2018 - M2 proton channels as targets for influenza vaccines – Leeds University - Dr Richard Foster

- Undertook a comprehensive literature review by critically evaluating primary sources.

2016 – 2017 - Discovery and development of novel GSK 3ß Kinase inhibitors – Leeds University - Dr Nimesh Mistry

- Identified potential new inhibitors using Argus Labs (protein docking software), supported by fluorescence assays to verify inhibitor activity.

VOLUNTARY EXPERIENCE/FELLOWSHIPS

2025-2025 – Nucleate Leadership Team
2023-2024 – Polaris Fellow, Entrepreneur First
2023-2024 – St Hugh's College Tutor in Biochemistry, Oxford University
2022-2023 – Student President, St Cross College, Oxford
2020-2022 - Chair of AstraZeneca's Early Careers AZ inspire Gothenburg
2019-2020 - Imperial Lates
2015-2018 - Volunteer at Leeds University Teddy Bear Hospital society

PUBLICATIONS

2024 - Rapid PROTAC Discovery Platform: Nanomole-Scale Array Synthesis and Direct Screening of Reaction mixtures: Doi: 10.1021/acsmedchemlett.3c00314
2024 - Development of an inhibitor of the mutagenic SOS response that suppresses the evolution of quinolone antibiotic resistance: https://doi.org/10.1039/D4SC00995A

AWARDS

2025 - SCI Scholar
2024 - Bursary from SCI to attend the 4th SCI / RSC Symposium on Anti-Infectives Drug Discovery.
2022 - Awarded the global internal Science Catalysts Award at Astrazeneca for Nano-PROTACs
2018 - The Elaine Hare Prize for Top Performing Third-Year Student: BSc Hons Medicinal Chemistry
2018 - Dean's List for Outstanding Academic Achievement: BSc Hons Medicinal Chemistry

PRESENTATIONS

2025 - Invited speaker at the 3rd Targeted Protein Degradation Conference in Japan (oral presentation)
2024 - Poster presentation at the Cell Symposia: Chemical biology in drugging the undrugged
2024 - Poster presentation at the 4th SCI / RSC Symposium on Anti-Infectives Drug Discovery

INTERESTS

University of Oxford Polo Club

- Medalled at the Summer Nationals 2018 and continues to compete at international events.

Club Captain at Guildford City Swimming Club

- Competed in the Commonwealth trials in the 100m Backstroke.
- Trained for over 18 hours a week while balancing academic commitments for more than 15 years.