# Alexander Drysdale

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## EDUCATION

### University of Bath – Biochemistry BSC with Professional Placement

**Year of Graduation: 2027**

- Achieved 70% (First Year) and 67% (Second Year) across modules including *Cancer Biology and Molecular Medicine, Infection and Immunity, Protein Structure and Analysis,* and *Dynamic Cell Biology*
- Developed an extensive wet lab portfolio, including genetic engineering, protein purification, crystallization and X-ray crystallography, PCR techniques and microbial work.

**Tonbridge School**

- A-Levels: Biology – A*, Chemistry – A*, Philosophy and Theology – A, AS Maths – A.
- 1st team Rugby Captain and School Prefect.

## PROFESSIONAL EXPERIENCE

### Machine Learning Engineer at Eli Lilly (Placement Student)

*Eli Lilly | Bracknell, UK | June 2025 - Present*

- **Developed an interactive prescribing analytics dashboard** using NHS Open Prescribing data (Python, Pandas, Streamlit, Plotly) to visualise national adoption of *Tirzepatide* vs *Semaglutide* across Integrated Care Board regions, deepening understanding of real-world drug uptake.
- **Researched and prototyped GraphRAG applications** for commercial and research use cases; built demos linking Neo4j knowledge graphs with Ollama-based entity extraction for healthcare policy and literature datasets; presented findings to senior leadership teams.
- **Maintained and extended a prescriptive analytics ML pipeline** (XGBoost, Kedro, AWS SageMaker) driving sales-forecasting and recommendation tools used by commercial teams; independently executed monthly runs and contributed to migration planning toward MLflow.
- **Experimented with next-generation modelling**, including deep learning architectures and few-shot meta-learning (MAML, Reptile) for low-data therapeutic launches, gaining hands-on experience in TensorFlow and Keras.
- **Founded and led the first Tech@Lilly Internal Hackathon**, securing executive sponsorship and clinical diagnostics data; coordinated 11 students to design three prototype solutions, strengthening the company's culture of internal technical innovation.

### Junior Data Scientist (Part Time)

*iOWNA Whealth | London, UK | January 2025 - June 2025*

- **Built interactive dashboards** in *Hedgehog* to analyse platform engagement, visualising metrics such as user retention, churn, and feature usage for both healthcare professionals and patients; insights informed product and business decisions for the executive team.
- **Prototyped a new core product feature**—a "Digital Pathway of Care" dashboard for doctors to monitor patients and interpret blood test results—by wireframing in *Balsamiq* and building a **Django-based front-end MVP**.
- Collaborated directly with the **founder (a clinician-entrepreneur) and CTO** to translate clinical workflows into digital solutions, accelerating the feature's development and supporting its **successful beta launch in August 2025**.

- Gained exposure to **startup operations and early-stage product strategy**, later becoming a **shareholder** and participating in investor discussions and company updates.

### Computational Lab Summer Internship at Imperial

*Imperial College London, Chem. Eng. department | London, UK | July 2024 – August 2024*

- Worked under **Luxi Yu (PhD, Imperial College London)** to develop dynamic, heterogeneous models of **fed-batch fermentation processes**, analysing variations in pH, dissolved gases, and substrate concentration across industrial bioreactors.
- Applied **CasADi** for implementing **Model Predictive Control (MPC)** and optimisation algorithms, predicting system behaviour and adjusting control inputs in real time.
- Contributed to the creation of a **quantitative modelling framework** to support process optimisation and improve yield consistency when scaling from lab to industrial production.
- Strengthened understanding of **bioprocess systems, optimisation theory, and mathematical modelling**, laying the groundwork for applying ML approaches to biological process control.

### Human Rights Volunteer and Primary School Teacher

*Umunthu Foundation / Bright Era Primary | Blantyre, Malawi | September 2022 – July 2023*

- Led community initiatives promoting girls' education, health awareness, and resilience during crises, including organizing educational sports events, coordinating cholera vaccination drives, and managing relief logistics during Cyclone Freddy.
- Taught science and technology to primary classes with 50+ students using creative, locally adapted methods, strengthening communication, project management, and cross-cultural engagement skills.

## PROJECTS & EXTRACURRICULAR

**ML projects**

- **Built a Multilayer Perceptron from scratch using exclusively numpy. Trained it on a stochastic model of the Repressilator gene network which I also built.**
- **Helped a university professor** with a leaf classification problem mapping out outlines and creating features from leaf images. Ultimately concluded that she required more data for better classification.

**Sustainability and Environment**

- Chair of the People and Planet society at Bath that runs a Fossil Free Careers Campaign, Sustainable Societies Guide and weekly meetings. Passionate about tackling and understanding climate change in order to protect those more vulnerable to its effects.
- Wrote and passed a sustainable careers student motion while sitting on the SU board.

**Ultimate Frisbee**

- Enjoy playing ultimate frisbee and represented the Bath Men's Outdoor team at two National tournaments where we placed 3rd in 2024 and 2nd in 2025.
- I travelled around the south of the UK playing indoor and outdoor fixtures for Bath mixed and men's teams.

## TECHNICAL SKILLS

**Programming languages:** Python, Cypher, HTML, CSS, R

**Computer software/ frameworks:** Amazon Sagemaker, Github, Kedro, Tensorflow

**References available upon request**