

Samuel Molyneux

St Andrews, KY16

DOB: 27.03.1996

Email: sam49@st-andrews.ac.uk

As a current PhD student in the Goss group, my interests lie in catalysis, both synthetic organic chemistry and enzymatic systems. My PhD research is focussed on developing aqueous cross coupling methodologies to be merged with biosynthetic organohalide generated using novel halogenases enzymes- this means and skills lie in synthetic organic chemistry, utilising bioinformatical tools to search for novel proteins, and enzyme production, purification, and analysis.

Education

University of St Andrews

PhD on CRITICAT CDT

Professor Rebecca Goss

September 2018- Present

Trinity Hall, University of Cambridge

BA, MSci, First Class with Honours in Natural Sciences

September 2014- June 2018

Wirral Grammar School for Boys

A Levels: Chemistry (A*), Physics (A*) English Lit (A*) Maths (A)

GCSE's: 11 A*, 1 A

September 2007- August 2014

Laboratory Experience

University of St Andrews

PhD Research: Professor Rebecca Goss

Genochemetics: Hyphenating Synthetic Biology and Synthetic Chemistry

Development of aqueous coupling methodologies for diversification of biosynthetically derived natural product analogues. In silico searching for novel biocatalysts followed by purification and activity assays.

April 2019-Present

University of St Andrews

CDT Mini-Project: Professor Andrew Smith

Synthesis of FeLT Ligand

Collaborative 10 week project with Borchers LTD to develop an alternative synthetic route to an industrially relevant catalyst

January 2019- April 2019

University of Cambridge

Part III Research Project: Dr Andrew Wheatley

Investigating the Reactions of Organoaluminiums with Esters.

Work involves the independent use of multiple air sensitive techniques and structure determination methods (notably multiple 1D and 2D NMR) to study the reactions of organoaluminium compounds with synthetic organic oils.

September 2017-April 2018

Awards

Trinity Hall Bateman Scholar

July 2018

Awarded for achieving First Class in the final year of study at Trinity Hall, Cambridge

Publications

Jonathan Slaughter, Samuel A. Molyneux, Andrew J. Peel, and Andrew E. H. Wheatley. *Action of Organoaluminum Reagents on Esters: Alkene Production and the Degradation of Synthetic Lubricants* Organometallics 2019, 38, 395–408

Volunteering and Outreach

CRITICAT Science Outreach Day for local Primary School

September 2019

Conducting **Mock Oxbridge Interviews** for Sixth Form Students

2014-2017

SocialMobility.org Advisor to Sixth Form Students

2014-2015

Research Skills and Knowledge

- Inert atmosphere techniques: Schlenk chemistry, glovebox chemistry, handling of pyrophoric organometallic reagents
- Spectroscopy: UV, IR, 1D and 2D NMR- ^1H , ^{13}C , ^{27}Al , ^{31}P
- Organic synthesis: Multistep reactions, microwave chemistry, purification techniques including normal and reverse phase flash column chromatography, antisolvent addition and recrystallisation development for when chromatography unsuitable
- Organic methodology: Screening of multiple ligands and catalysts on small scale, multiple in parallel reactions
- *In silico* bioinformatical analysis: Utilising BLAST searching, multiple sequence alignments, phylogenetic analysis tools, genome analysis tools (antiSMASH), to identify novel enzymes for biocatalysis
- Recombinant protein expression and purification

Presentations and Posters

- Research Presentation- **Development of an Alternative Synthetic Route to a Pentadentate Ligand for an Industrially-Relevant Iron (II) Catalyst**
CRITICAT Annual Catalysis Conference 2019, Heriot-Watt University (8/04/19)
- Poster Presentation- **VirX1: The First Viral Halogenase and the First Flavin Dependent Iodinase**
SCI-RSC: Applied Late Stage Functionalisation, University of Manchester (18/02/20)

Additional Skills and Interests

- Violin Grade 8 (ABRSM)
- Cox for Trinity Hall Boat Club (THBC)