

## Personal Information

Name: Alistair William Thomas King  
Address: Henrik Lättiläisen katu 23 C 26, 00710 Helsinki  
Phone #: +358505279446  
DOB: 21.01.1976



## Education

Ph.D. in Organic Chemistry, The Queens University of Belfast, 2002  
B.Sc. (Hons) in Chemistry, The Queens University of Belfast, 1997  
Languages: English (Fluent), Finnish (Amateur)

## Positions & Mobility

**Current Position:** I have been a researcher at the University of Helsinki for the last 14 years (Aug 2016) and currently hold the title of **Docent in Organic Chemistry** (Adjunct Professor) and **University Researcher** (01.01.2016). I work in the general areas of synthetic organic chemistry, physical organic chemistry, ionic liquids and biomass processing & analytics. However, my main focus is on the **conversion cellulose to novel products**.

I am established as an **independent researcher and supervisor** as I have my own funded projects but also work on projects where Prof. Kilpeläinen (dept. head) is the PI. Currently I am responsible for planning and supervising a portion of the research and students in the Kilpeläinen research group. At present, this amounts to about approx. 4 PhD students and 4 post docs. At present I also have 2 post docs, 1 BSc and 1 MSc student working on my own Finnish Academy funded project (WTF-Click-Nano).

The **main projects** I am currently working on are several projects related to the IONCELL process (<https://youtu.be/AGFDPyzN1C8>), which is a collaborative project with Aalto University. This process recently won the Hennes & Mauritz Global Change Award ([www.globalchange.com](http://www.globalchange.com)). Aalto University (Herbert Sixtas group) and VTT (Ali Harlin) are also co-recipients of this award, which was presented by HRH Crown Princess Victoria of Sweden. As mentioned above, I am also developing my own research in the area of sustainable processing of nanocellulose (WTF-Click-Nano Finnish Academy Project).

My **current research interests** are in the demonstration of platform technologies for development of a portfolio of novel sustainable biomass conversion processes. This has evolved from understanding of key areas such as wood chemistry, cellulose structure and chemistry, nanocellulose (liquid-state NMR analytics and chemical modification), lignocellulose analytics in general (mainly NMR), ionic liquid development for cellulose and wood modification/fractionation, novel solvents, green chemistry, surfactants, hydrotropes and bitumen/oil processing. While I work in an academic laboratory, much of the work is close to business environments, in larger consortia.

Previously, I have also been working on development of routes to drug target libraries although many topics in organic and physical organic chemistry have been covered, including the application of quantum computational methods in organic chemistry. I have a very broad background and strong international experience. My international recognition is actually much higher than my current employment status in Finland.

**Previous Positions:** **Custom Synthesis Chemist** for Chemical Synthesis Services (CSS)-Almac Group/Sciences, Northern Ireland (2002-2004): My role here was to troubleshoot and complete custom synthesis contracts, in the laboratory, for g to kg multistep syntheses. These were mainly contract syntheses for pharmaceutical companies. This involved all kinds of chemistries: chiral, low temperature organometallic, up to 40 L high-pressure hydrogenations. Most of the syntheses were roughly pre-planned with the customers however it was my responsibility to troubleshoot the syntheses during the contracts. Things often did not go to plan and required a

good knowledge of chemistry to reach the targets within the deadlines and budgets. The chemistry was also often very hazardous and on a large-scale. Not a position I would like to repeat due to the hazardous nature of the job but an excellent learning experience.

During my post-doctoral period (2004-present) I spent 4 months as a '**Visiting Scholar**' in North Carolina State University (NCSU) at the '**Department of Forest Biomaterials**', Raleigh, North Carolina. During this post-doctoral period, I also spent 2 weeks as a '**Visiting Scholar**' to the **Joint Bioenergy Institute** (JBEI) in Berkeley, California, USA.

### Professional Activities & Achievements

**Editorial Work:** I have only had the opportunity to edit book chapters with several contributors but I have a book proposal accepted (co-editor Michael Hummel) with the **RSC Green Chemistry Book Series** provisionally titled '**Cellulose Processing with Ionic Liquids**'. Estimated publication date is in 2020.

### Expert and Reviewer Tasks:

- I am or have been referee for a series of highly respected journals: *Science*, *JACS*, *Angewandte Chemie Int. Ed.*, *Green Chemistry*, *ChemSusChem*, *Cellulose*, *Biomacromolecules*, *ChemPlusChem*, *New J. Chem.*, *RSC Adv.*, *Sustain. Chem. Eng.*, and others.
- In 2016 I was nominated in the **top 10 reviewers** for Green Chemistry, by the editors: <http://blogs.rsc.org/gc/2016/09/20/top-10-reviewers-for-green-chemistry/>
- In March 2017, I was an **offsite reviewer** for H2020 - FET Open applications (Future and Emerging Technologies).
- I have been reviewing academic funding applications for the **Estonian Research Council**. I have also received offers to review other applications in different (mainly Scandinavian) countries but have rejected these due to time constraints.
- I have provided **expert comments** for one article ('Waste office paper comes to a sticky end' by Debbie Houghton) published in the RSC magazine **Chemistry World**, and another article ('From trickle to torrent' by Michael Freemantle) which highlighted certain aspects of my research.
- I have acted as an '**Industrial Advisor**' for an EPSRC project symposium (EP/K014676/1, Ionic Liquid Biorefining of Lignocellulose to Sustainable Polymers, contact: Jason Hallett, Imperial College).
- I have acted as contributor to several project development workshops for FIBIC and external consultancy organisers.
- I have been asked to carry out activities related to reviewing COST action proposals and to take part in administration of a COST action (STSM application coordinator) but have rejected these due to time constraints.
- I have acted as opponent for 2 PhD thesis (Dr. **Elena Privalova** – Process Chemistry Center, Åbo Akademi University, Finland & Dr. **Stephen Green** – School of Physics and Astronomy, University of Leeds, United Kingdom) and been on the doctoral thesis defence committee for one thesis in Sweden (Dr. **Artur Hedlund**, Chalmers, Gothenburg, Sweden)

**Thesis Supervision:** I have co-supervised many undergraduate and MSc students. I have been planning thesis work and supervising PhD students for the last 14 years. Several of the PhD students have completed their PhDs or are in the process of completing their PhDs. The official supervisor is Prof. Ilkka Kilpeläinen. I am listed as co-supervisor on several of these already completed: Sara Labafzadeh, Arno P. Parviainen, Ashley J. Holding

### Positions of Trust & Leadership:

- I was assigned the task of '**Work Package Leader**' for the FuBio | JR2 | WP2 project, run by the Finnish Bioeconomy Cluster (FIBIC). This involved coordinating the activities of 6 research groups working on a common project, organizing meetings, presenting results to the industry members and organizing 2 international symposia.

- I was a **'Substitute Management Committee Member** (Sub. MC Member)' for the 'EXIL' (Exchange on Ionic Liquids) 1206 Cost Action
- I have been supervising and planning the work for several PhD students over the last 14 years. I have also been doing the same for 6 post docs working on my own projects over the last 5 years. Previous to this I have been supervising work for many undergraduate and MSc students.

#### **Conference Organisation:**

- I will co-organise (With Stephen Eichhorn, Michael Hummel and Janet Scot) a symposium on processing cellulose with novel solvents for the Cellulose Division at the 2019 American Chemical Society National Convention.
- I have acted as main symposium organiser for 5 small international symposia (< 20 presentations) in Finland. I have also acted as chair for these symposia. These concerned the processing of woody biomass with ionic liquids and we received contributors from USA, UK, Germany, Sweden, Japan, Portugal and Finland.
- I have been involved in organising many smaller national symposia at the University of Helsinki.
- I have also acted as a substitute session chair and minor role as a coordinator in the 14h European Symposium on Organic Chemistry (ESOC14, Helsinki) and the XXII Conference on Polyphenols (ICP2004, Helsinki).

#### **Teaching Duties:**

- Demonstration of undergraduate organic chemistry **laboratory courses** at The **Queens University of Belfast**, during my PhD studies.
- Lectures given (4 hr) in 2004 for a short MSc course titled '**Green Chemistry**', organised by Kristiina Wähälä at the **University of Helsinki**. The topic was on 'Biocatalysis'.
- Lectures given (4 hr) at Aalto University for a PaPSaT '**Cellulose Chemistry**' course, organised by Prof. Herbert Sixta (Puu-23.6080) in 2014 at **Aalto University**. The lectures were on 'The fundamentals of cellulose dissolution and chemical modification in ionic liquids'.
- As of September 2014, I coordinated a 7 cr course titled '**Advanced Biomaterial Chemistry and Technology**' (Puu-0.4100) at **Aalto University**, replacing Assistant Prof. Eero Kontturi as he was taking a sabbatical for 1 year. The lectures (10 hr) were mainly on wood biopolymer structure and chemical transformation into novel products. Special focus was given to cellulose and nanocellulose processing. This also included organising student seminars, refinement and supervision of laboratory exercises and holding oral examinations.
- In October 2014 I lectured (2 hr) for a course on '**Supramolecular Chemistry**', organised by Juho Helaja at the **University of Helsinki**. The topic was on ionic liquids with special focus on '**Cellulose Structure and Dissolution**'.
- In November 2014 I gave my demonstration lecture for the position of Docent at the Laboratory of Organic Chemistry, Department of Chemistry, **University of Helsinki**. The title of the lecture was '**Thermodynamics in Organic Chemistry**', designed as a lecture in a course titled 'Sustainable Industrial Chemistry' (under development). The Docent position was granted in January 2015.
- In February 2016 I have lectured (1 hr) in a course titled '**Biosynthesis, composition and degradation of plant cell walls**' at the Department of Food and Environmental Sciences, **University of Helsinki**, on the topic of '**Novel materials from cellulose and wood**'.
- In April 2016 I gave a lecture (1 hr) in a COST-action (FP1205) training school in **Stockholm** on '**Chemical Modification of Nanocelluloses**'.
- In June 2016 I gave lectures (3\*1 hr) in a postgraduate course in **Aalto University** titled '**Cellulose Chemistry**' (Herbet Sixta) on the topics of '**Cellulose Dissolution**' and '**Chemical Modification**'.
- In August 2016 I gave lectures for a postgraduate course on '**Biorefineries Chemistry**' at the **University of Helsinki**. 3\*1 hr on '**New cellulose-based materials**' and 1 hr on '**Biocomposites**'.
- In August 2016 I gave a lecture on '**Cellulose Chemistry**' at the Swedish-Finnish Joint Summer School in **Ahvenanmaa** titled '**New Materials from Trees**'.

- In August 2018 I gave lectures (3 hr) on '**Chemistry and NMR analysis of Nanocellulose**' for the Bio2Future PhD summer school in **Aalto University**, on the course titled '**Nanocellulose: relationship between fundamentals and applications**', which was coordinated by Prof. Eero Kontturi.
- Starting next year (January) I will coordinate a course (7 cr) on '**Chemistry and Environmental Chemistry in Water**' at the **University of Helsinki**. The essence of this course will involve the environmental chemistry of water but also detail the properties of water at a fundamental level and examine current and novel industrial processes in water.

**Public Appearances:** I have given close to **100 oral research presentations** at national or international symposia or conferences. Over 20 of these were invited and keynote presentations.

**Awards:**

- In Sept 2016 I was named in the top 10 reviewers for the journal Green Chemistry: <http://blogs.rsc.org/gc/2016/09/20/top-10-reviewers-for-green-chemistry/>
- In February 2016 we (Ilkka Kilpeläinen, Alistair King & Arno Parviainen) were awarded first prize in the '**Hennes & Mauritz (H&M) Global Change Award**', along-side Aalto University (Sixta research group) and VTT (Ali Harlin), for the combination of **IONCELL-F** and an associated cotton textile recycling process. The award seeks to promote environmental sustainability and there was a prize for first place of 300000 €. The decision was made to use the prize money for our research.

**Publications & Impact:**

- I have **53 peer-reviewed journal publications**, 4 further submitted, 6 in preparation, 19 extended abstracts, 8 book chapters (7 published, 2 submitted) and 10 patents (6 world patents published, 1 PCT application currently in process, 4 national filings, and 1 invention disclosure waiting for national filing). The vast majority of these publications were obtained in the last 10 years and I now average about 10 peer-reviewed manuscripts per year. I have > 1850 citations and an H-index of 21 (Scopus).
- I was recently featured on a Prisma-YLE television program (25<sup>th</sup> of March, 2015, <http://yle.fi/aihe/artikkeli/2015/03/23/prisma-studio-jatteesta-uutta-paalle-pantavaa>) concerning the novel uses of biomass and recycling of cellulose waste. My role as interviewee was as an expert on ionic liquids for cellulose upgrading.
- I was also interviewed recently by Franck Media ([www.franckmedia.com](http://www.franckmedia.com)) for their 'Future of Finland' television series. The pilot was recently shown on MTV3 and the series in general looks at the technological economic successes of Finland and in particular its future Bioeconomy. It is likely I will be featured in the post pilot episodes and have agreed with the organisers that I can contribute in the future.

**Hobbies:** I try to fit exercise in my schedule. This mainly involves cycling almost everywhere but I also play badminton competitively (with friends) and swim, having competed internationally at a younger age. I love to downhill ski whenever possible. I have an amateur interest in scripting simple programs (python, bash) and more active interest in quantum chemical computational chemistry. I have several other developing interests, such as astrophotography, politics, philosophy, history and philosophy of science, mushroom picking and music production. However, most of my spare time now goes towards family activities, such as playing, cycling to different locations or swimming with my daughter.