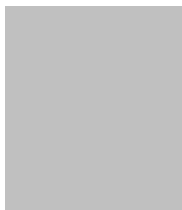







## PERSONAL INFORMATION

## Janet Irungu



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-  [State personal website\(s\)](#)

## RESEARCH EXPERIENCE

(July 2013 - Present)

**Research Scientist, African Insect Science for Food and Health (*icipe*), Kasarani, Kenya**

- Develop, validate and standardize analytical protocols to identify chemical contaminants/pollutants, including pesticide residues, antibiotics, aflatoxins, that are hazardous to human, environment and animal health using both GC-MS and LC-MS/MS analysis.
- Support continuous monitoring of chemical contaminants in food, feed and the environment using the standardized methods
- Promotion of green economy in Africa through empowerment of resource limited rural communities to sustainably produce medicinal and insecticidal plants and products as alternatives to synthetic chemicals for pests and disease management.
- Discover, characterize, and support development of natural products of medicinal value.
- Develop and validate methods for quantification of nutrients in food and feed.
- Develop standardized methods for quality control analysis for honey and other hive products to synchronize with International Honey Standards as specified in Codex Alimentarius.
- Develop methods to determine the influence of pesticides on health, behaviour, nutrition and physiology of different bee races.
- Development of environmentally friendly (semiochemical-based) pest managements tools

(Jan 2008 - July 2012)

**Senior Analytical R&D Scientist, Sigma Aldrich, St Louis MO, USA ([www.sigma-aldrich.org](http://www.sigma-aldrich.org))**

- Provided analytical support to Research Biotech and product development teams in glycans (carbohydrate) and glycoprotein studies by using various Mass Spectrometry platforms (LC-ESI-FTMS, LC-LCT-MS, LC-LTQ-MS, LC-QTOF-MS, LC-QSTAR-MS, LC-QTRAP-MS, MALDI-TOF/TOF MS) to solve analytical problems, optimize processes, develop new assays and assist in the analysis of new products.
- Worked independently to develop new R&D protocols and workflows for carbohydrate and glycopeptides analysis.
- Generated application data related to carbohydrate analysis supporting marketing of new Biotech products and evaluation of new technologies for Business Development.
- Trained other scientists and technicians on how to employ new and existing protocols to solve analytical problems.
- Performed research following company guidelines including safety compliance and GLP (or cGMP, ISO 9000) when applicable.
- Acted as the analytical project team leader in carbohydrate related studies to ensure successful completion of customer projects.
- Acted as the key contact person addressing any queries from customers and other departments in the company related to carbohydrate/glycoprotein studies.
- Coordinated projects with supervisors, project managers and team leaders to identify the required laboratory resources and project milestones.
- Led and/or supported troubleshooting and problem-solving initiatives in support of high-value products.
- Wrote official reports and presented findings to customers across the world.
- Performed routine and maintenance checks on assigned group instruments.

(Jun 2005 - Dec 2007)

**Graduate Research Assistant, Department of Chemistry, University of Kansas, KS, USA**  
**Advisor: Dr. Heather Desaire**

- Developed a practical LC-MSMS technique to characterize a HIV vaccine candidate glycoprotein, JRFL gp140.
- Developed a capillary LC-MSMS method and applied it to characterize a HIV vaccine candidate (CON-S gp140-CFI, a glycoprotein with 31 potential glycosylation sites) in a site-specific manner.
- Developed a novel mass spectrometry method to enhance and characterize sulfated glycoproteins using ion-pairing reagents.
- Characterized glycoprotein hormones hLH, hFSH, eFSH, and eTSH using various LC-MSMS techniques (ESI- q-TOF and ESI - FT-MS).
- Developed a novel MS/MS method that complements Edman Chemistry in identifying the peptide portion of acidic glycopeptides.
- Maintained group instruments and performing routine maintenance checks.

(June 2002-July 2003)

**Assistant Chemist, Midwest Research Institute, Kansas City, MO, USA**

- Provided chemical support for product chemistry research and analysis of test articles for the Environmental Toxicological Program (ETP).
- Provided support for ETP through test article preparation from biological matrices for chemical contaminant analysis using GC and HPLC.
- Responsible for performing experimental work, recording results, conducting preliminary data analysis, reviewing data for SOP compliance, preparing quality control samples, and maintaining laboratory notebooks.
- Responsible for conducting studies on chemical contaminants according to written protocols as regulated by GLP standards and Food and Drug Association (FDA).

(Summer 2001)

**Laboratory Technician (Internship), Kerry Ingredients, Gardner, KS, USA.**

- Tested food products for a variety of qualities based on standardized procedures.
- Assessed all outgoing food products to ensure internal and external quality standards.
- Ensured the instruments were in good working conditions and scheduled maintenance.
- Developed monthly reports on existing and outgoing products that passed quality assessment.
- Performed other duties as directed by team leader and supervisors.

(Winter2001-Winter 2002)

**Undergraduate Research Student, Park University, Parkville, Missouri, USA**

- Performed an independent investigation to determine mercury and lead content in Lake Houston water in Missouri, using Atomic Absorption Spectroscopy.
- Wrote a professional report on the findings and gave an oral presentation on the results

## TEACHING EXPERIENCE

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2014-to date

**Supervisor, African Insect Science for Food and Health, *icipe***

**PhD students (3):**

Teresiah N. Njihia -Thesis topic %Development of a trapping system using semiochemicals for the management of *Antestia* bugs, *Antestiopsis thunbergii* (Heteroptera: Pentatomidae) in coffee.+

Njelembo Joshua Mbewe. Thesis topic "Assessment of the efficacy of a repellent mixture isolated from waterbuck to protect cattle and enclosures (kraals) from a vector of human sleeping sickness - *Glossina fuscipes fuscipes*."

AARPIS Ph.D student (granted) -Thesis topic %Development of a semiochemical-based in-hive trapping system for management of *Varroa* mites in African honeybees.+

**MSc students (4):**

Protus Mulati -Thesis topic %Neonicotinoid residues in African honeybees and hive products in selected apiaries in Kiambu.+

Ednah Komen . Thesis topic “Identification of bee brood volatiles that are electro-physiologically and behaviorally active for Varroa mites.+

Mapili Millicent –Thesis topic %Analysis of pesticide residues and their metabolites in soil, plan and edible produce from organic and conventional farming systems in the sub-humid region of the central highlands of Kenya.”

Pamela Seda . Thesis topic %Changes in the brain Dopamine titer and vitellogenin expression levels associated with age, pests and diseases in honey bees, *Apis mellifera scutellata*.”

**2010 Mentor, Sigma-Aldrich, St. Louis, MO, USA**

- Mentored minority high school students in greater St Louis area and encouraged them to pursue science in college and as a career.
- Developed and maintained studentsqinterest in science by organizing activities that motivated them.
- Outlined to studentsqglobal advances that have been brought about by science and the need for them to participate in changing the world through science.
- Successfully achieved student participation by utilizing age-appropriate material that focused on relevant topics to gain and maintain studentsqinterest in science.

**(Fall 2006) Graduate Teaching Assistant in Analytical Chemistry, University of Kansas, KS**

- Encouraged students to actively participate in classroom and group activities.
- Promoted creativity and open-mindedness in class work.
- Assisted with mid and end term assessment of studentsq progress.
- Maintained studentsqrecords and carried out administrative tasks.
- Collaborated with peers to enhance the instructional environment.
- Established and maintained cooperative working relationships with student and colleagues.
- Inspired students to integrate technology into daily classroom activities.

**(Winter2004-2005) Graduate Teaching Assistant in General Chemistry, University of Kansas, KS**

- Maintained a highly-motivated classroom by using meaningful demonstrations
- Prompted student motivation, participation, and effective learning through the implementation of positive reinforcement and weekly rewards
- Offered extracurricular tutoring to ensure each student grasped the main concepts

**(Fall 2003) Graduate Teaching Assistant in Organic Chemistry, University of Kansas, KS**

- Worked towards improving student participation in the groups and classroom
- Held discussions and lectures to help students with exams, homeworks and other problem related to the main chemical concepts covered in the course

**EDUCATION AND TRAINING**

- (Fall 2003-Fall 2007) PhD, Bio-Analytical Chemistry, University of Kansas, Lawrence, KS, USA, Fall 2007.
- (Fall 2000-Spring 2002) B.Sc., Chemistry and Biology, Park University, Parkville, MO, USA, 2000 - 2002.
- (Spring 1999-Fall 2000) Pharmacy training program, University of Missouri-Kansas City, MO, USA, 1999 - 2000.
- (Jan1996-Dec1998) Certified Public Accountant, Strathmore School of Professional Studies, Kenya, 1996-1998.

**PERSONAL SKILLS**

Language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1/2	C1/2	C1/2	C1/2	C1/2
	Replace with name of language certificate. Enter level if known.				
Kiswahili	C1/2	C1/2	C1/2	B1/2	B1/2
	Replace with name of language certificate. Enter level if known.				

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user  
Common European Framework of Reference for Languages

- Communication skills**
  - Great communication skills.
- Organisational / managerial skills**
  - Leadership (gained through teaching, chair of the proteomics-analytical groups social activities at Sigma-Aldrich, spear-headed seminar trainings in glycosylated proteins research for pharmaceutical companies in Boston area, USA)
- Job-related skills**
  - Good command of quality control processes (previously involved in several quality control analysis of Sigma-Aldrich products, Midwest Research Institute and at Kerry Ingredients)
- Computer skills**
  - Good command of Microsoft Office<sup>®</sup> tools and other data analysis softwares (Masslynx, Biopharmalynx, Xcalibur, ChemStation, Empower, Mascot, Scaffold, Data Explorer, Analyst, PLGS)

**ADDITIONAL INFORMATION**
**Publications**

Makori, D.M., Fombong, A.T., Abdel-Rahman, E.M., Nkoba, K., Ongus, J.R. **Irungu, J.**, Mosomtai, G. Makau, S., Mutanga, O., Odindi, J., Raina, S. and Landmann, T. Predicting Spatial Distribution of Key Bee Pests in Kenya using Remotely Sensed and Bioclimatic Variables. International Journal of Geographical Information Scienc, 2017, 6(3).

Musundire R., Osuga I.M., Cheseto X., **Irungu J.** and Torto B. (2016) Aflatoxin Contamination Detected in Nutrient and Anti-Oxidant Rich Edible Stink Bug Stored in Recycled Grain Containers.

PLoS ONE 11(1): e0145914. doi:10.1371/journal.pone.0145914.

**Janet Irungu**, Suresh Raina, Baldwyn Torto. (2016) **D**etermination of pesticide residues in honey: a preliminary study from two of Africa's largest honey producers. *International Journal of Food Contamination*. 3(1), 1-14 DOI: 10.1186/s40550-016-0036-4.

**Janet Irungu**, Ayuka T. Fombong, Justus Kurgat, Protus Mulati, Juliette Ongus, Kiatoko Nkoba, Suresh Raina (2016) **A**nalysis of Honey Bee Hive Products as a Model for Monitoring Pesticide Usage in Agroecosystems. *Journal of Environment and Earth Science*, 6(8), 9-16.

Hao Zhang, Richard Y.C. Huang, Pegah Jalili, **Janet Irungu**, Gordon Nicol, Kevin Ray, Henry Rohrs, Michael L. Gross. Improved Mass Spectrometric Characterization of Protein Glycosylation Reveals Unusual Glycosylation of Maize-Derived Bovine Trypsin. *Analytical Chemistry*, 2010, 82, 10095-10101.

**Janet Irungu**, Vicki Caligur. Glycoprotein Analysis. Sigma Life Science BioFiles; *Glycobiology*, 2010, 5, No. 1

Desaire H, Haynes BF, Go EP, Laio H, Sutherland LL, Chang Q, Zhang Y, **Irungu J**, Alam SM. "Glycosylation: an important factor in Env diversity". *Retrovirology*, (2009), 6, P378.

**Janet Irungu**. **S**ite-specific analysis of glycosylated proteins using mass spectrometry. *KU Chemistry Dissertations and Theses*, 2009.

**Irungu, Janet**; Eden P. Go, Ying Zhang, Dilusha S. Dalpathado, Hua-Xin Liao, Barton F. Haynes and Heather Desaire. Comparison of HPLC/ESI-FTICR MS versus MALDI-TOF/TOF MS for glycopeptide analysis of a highly glycosylated HIV Envelope glycoprotein, *J. Am. Soc. Mass Spectrom.* 19, 1209-1220 (2008)

Eden P. Go, **Janet Irungu**, Ying Zhang, Dilusha S. Dalpathado, Hua-Xin Liao, Laura L. Sutherland, S. Munir Alam, Barton F. Haynes and Heather Desaire. Glycosylation Site-Specific analysis of HIV envelope proteins (JR-FL and CON-S) reveals major differences in glycosylation site occupancy, glycoform profiles, and antigenic epitopes' accessibility, *J. Proteome Res.* 7, 1660-1674 (2008)

George R. Bousfield, Vladimir Y. Butnev, Jean-Michel Bidart, Dilusha Dalpathado, **Janet Irungu** and Heather Desaire. Chromatofocusing fails to separate hFSH isoforms on the basis of glycan structure, *Biochemistry* 47, 1708-1720 (2008)

**Irungu, Janet**, Eden Go, Dilusha S. Dalpathado, Heather Desaire. **S**implification of mass spectral analysis of acidic glycopeptides using *GlycoPep ID*. *Analytical Chemistry* (2007), 79, 3065-3074.

**Irungu, Janet**; Dalpathado, Dilusha S.; Go, Eden P.; Jiang, Hui; Ha, Hy-Vy; Bousfield, George R.; Desaire, Heather. **A** Method for Characterizing Sulfated Glycoproteins in a Glycosylation Site-Specific Fashion, Using Ion Pairing and Tandem Mass Spectrometry. *Analytical Chemistry* (2006), 78(4), 1181-1190.

Dalpathado, DS.; **Irungu, Janet**; Go, Eden P.; Butnev, Vladimir Y.; Norton, Katie; Bousfield, George R.; Desaire, Heather. **C**omparative Glycomics of the Glycoprotein Follicle Stimulating Hormone: Glycopeptide Analysis of Isolates from Two Mammalian Species. *Biochemistry* (2006), 45(28), 8665-8673.

Jiang, Hui; **Irungu, Janet**; Desaire, Heather. Enhanced detection of sulfated glycosylation sites in glycoproteins. *J Am Soc Mass Spectrom.* 2005, 16(3), 340-348.

### In preparation

**Janet Irungu**, Justus Kurgat, Ayuka Fombong, Juliette Ongus, Kiatoko Nkoba, Suresh Raina. "Using hazard quotient to perform risk assessment of African honey bees to pesticide residues through food consumption."

**Janet Irungu**, Mokaya Hosea, Suresh Raina. "Comparative analysis of physicochemical properties of honey from various regions in Africa."

## Presentations

Waters Technology Seminar on Separation Science (UPLC, LC-MS/MS, LC-TOFMS), icipe, Nov 2014

**Janet Irungu**, Jennifer Crawford. Glycoprotein Analysis Using Mass Spectrometry. Pharmaceutical Companies in Boston Region, MA. Feb, 2011 (Spear headed the Training)

**Janet Irungu**, Eden P. Go, Ying Zhang, Dilusha S. Dalpathado, Hua-Xin Liao, Barton F. Haynes, and Heather Desaire. %Glycosylation site-specific characterization of a HIV vaccine candidate, CON-S gp140□CFI, a glycoprotein with 31 potential glycosylation sites.+American Society for Mass Spectrometry National Meeting, Indianapolis, IN. May, 2007 (Poster)

**Janet Irungu**, Dilusha S. Dalpathado, Hy-Vong, George Bousfield, and Heather Desaire. %Simplification of Mass Spectral Analysis of Acidic Glycopeptides Using Tandem Mass Spectrometry and Database Searching.+American Society for Mass Spectrometry National Meeting, Seattle, WA. May, 2006 (Poster)

**Janet Irungu**, Dilusha S. Dalpathado, Eden P. Go, Hui Jiang, Hy-Vy Ha, George R. Bousfield, and Heather Desaire %A Site-Specific Approach for Characterizing Sulfated Glycopeptides Using Ion-Pairing and FTICR-MS+. American Society for Mass Spectrometry National Meeting, San Antonio, TX. May, 2005 (Poster)

## Projects

EU-Switch Africa Green Project: Lead Scientist to support up-scaling sustainable commercial production of medicinal plants by community-based conservation groups at Kakamega forest in Kenya. (2017)

Biovision project: Enhancing the sustainability of community-based insecticidal and medicinal plant enterprises, bio-monitoring of environmental health and youth sensitization in Kenya and Tanzania for livelihood improvement and biodiversity conservation (2017)

EU Bee Health Project: Research Scientist in charge of carbohydrate, flavonoids, aflatoxins, pesticide residual analysis, semiochemical and quality control analysis (2013-2017)

Plant-derived Flu Vaccine Development: Senior Scientist in charge of structural characterization of oligosaccharides of hemagglutinin(HA) of influenza virus (2010-2012)

Development of Biosimilar for Erbitux for Cancer treatment: Senior Scientist in charge of identification and structural changes analysis of post-translational modification on the recombinant proteins (2009-2010)

Beta-Elimination Kit Development: Senior Scientist in charge of developing methods for characterizing O-glycosylated proteins (2008-2010)

Raw Material Characterization: Senior Scientist in charge of antibody characterization (2010-2012) . Sigma/Amgen funded

Trypzean Project: Senior Scientist in charge of identification of unusual modifications of the enzyme (2007-2012)

Impurity and precipitation project. Scientist tasked to identify and quantify impurities present in Amgen raw materials for drug formulation (2010)

Characterization of recombinant proteins. Senior scientist in charge of characterization of glycosylation pattern of recombinant proteins (2009-2012)

HIV vaccine development: A collaborative project with Duke University funded by Bill & Melinda Gates and NIH.

Characterization of Glycoproteins hormones and viral proteins: PhD student required to develop LC-MSMS methods for characterizing glycoproteins in a site-specific manner (2004-2007)

Drug Metabolites Profiling: PhD student involved in developing mass spectrometry methods for analyzing metabolites (2004-2005)

### Conferences

MicroSep Technology Conference and Expo, Johannesburg, SA. July 2014

Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (Pittcon), Chicago, IL 2011

Society for Glycobiology Meeting , St Pete Beach, FL, 2010

Society for Glycobiology Meeting, San Diego, CA, 2009

American Society for Mass Spectrometry National Meeting, Indianapolis, IN, 2007

American Society of Mass Spectrometry National Meeting, Seattle, WA, 2006

American Society of Mass Spectrometry National Meeting, San Antonio, TX, 2005

### Honors and Awards

Honors for Final Oral Doctorate Examination

McCollum Chemistry Research Scholarship recipient for outstanding graduate research, 2007.

KU Scholarship recipient for F Lower Graduate School P/G Berger, Emily V Sch-Chemistry, 2003 to 2005.

KU Scholarship recipient for F Lower Graduate School P/G Bailey, George Corbin Mem Sch, 2003-2005

Dean's List, Park University, 2001- 2002.

### Professional Development

Fourth annual workshop and training for EU Reference Laboratory for Pesticide Residue Analysis, 2013.

Carbohydrate training workshop, 2008, Complex Carbohydrate Research Center , GA, USA.

GLP Training, 2002.

PLGS and BioPharmalynx software training, 2009.

### Membership

American Society of Mass Spectrometry, Society for Glycobiology, American Chemical Society

### References

Available Upon Request