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Alma Tamunonengiofori Banigo

Nationality: Nigerian (Nigeria) **Place of birth:** Port Harcourt, Nigeria

Gender: Female **Email address:** atbanigo@gmail.com

LinkedIn: https://www.linkedin.com/in/alma-banigo-a2a911167/

Website: https://scholar.google.com/citations?user=bnoroIoAAAAJ&hl=en

ABOUT ME

Biomedical researcher and educator with a PhD focused on hyaluronic acid and dextran-based hydrogels for tissue engineering applications and a strong background in cell and molecular biology, biomaterials, cartilage repair, tissue engineering, and regenerative medicine. I have hands-on experience with 2D and 3D cell culture, polymer synthesis, hydrogel formation, 3D bioprinting, biocompatibility testing, and mechanical characterization. Eager to conduct interdisciplinary research to bridge the gap between biology and engineering, especially in studying tissue interfaces. I aim to play a significant role in your interesting research in the musculoskeletal system, biomaterials, tissue engineering, and regenerative studies.

WORK EXPERIENCE

Self-Employed – Remote

City: Remote

Freelance Biomedical Researcher & Scientific Writer

[01/01/2025 – Current]

-Writing book chapters (e.g., for Elsevier).
-Reviewing scientific manuscripts (e.g., for Springer Nature on polysaccharides in cartilage tissue engineering).
-Preparing and submitting grant and fellowship applications.
-Writing a nonfiction book on grit and personal development, blending storytelling with research-informed strategies for resilience and success.

Department of Developmental BioEngineering, University of Twente – Enschede, Netherlands

City: Enschede | **Country:** Netherlands

PhD Researcher in Tissue Engineering and Biomaterials (Hyaluronic Acid & Dextran Hydrogels)

[01/02/2020 – 31/10/2024]

-Designed and synthesized injectable hydrogels and bioinks for tissue engineering applications, especially in cartilage repair and regeneration.
-Conducted 2D and 3D cell culture (including >200M cells/ml), histology, confocal imaging, and immunoassays.
-Designed and utilized SOPs, maintained lab notebooks, and ensured data reproducibility, following GLP/GMP standards.
-Supervised undergraduate thesis projects on bioprinting and tissue scaffold design.
-Published 5+ articles in peer-reviewed journals

Department of Biomedical Engineering, Federal University of Technology Owerri – Owerri, Nigeria

City: Owerri | **Country:** Nigeria

Lecturer in Department of Biomedical Engineering

[25/06/2015 – 31/01/2020]

-Delivered lectures in biomedical engineering, biotechnology, biomaterials, and tissue engineering to undergraduate students and supported in training postgraduate students.

-Supervised more than 20 undergraduate projects, particularly in biomaterials and tissue engineering.
-Coordinated industrial visits and mentored a cohort of 80+ students.
-Developed curriculum along with senior lecturers and laboratory manuals.

Nigeria National Petroleum Corporation – Port Harcourt, Nigeria

City: Port Harcourt | **Country:** Nigeria

Industrial Trainee in Research and Development Division

[01/01/2008 – 31/12/2008]

-Trained in specimen sampling, microscopy, and data interpretation for environmental biology studies.
-Assisted with biocompatibility assessments and environmental risk analyses during short field trips.
-Supported environmental assessments, data collection, and laboratory operations.

EDUCATION AND TRAINING

PhD in Tissue Engineering and Biomaterials (Hyaluronic Acid & Dextran Hydrogels)

University of Twente [01/02/2020 – 31/10/2024]

City: Enschede | **Country:** Netherlands | **Website:** https://www.utwente.nl/ | **Level in EQF:** EQF level 8 | **Thesis:** Hyaluronic acid and Dextran for Tissue Engineering Applications

- Full scholarship recipient (Bonny Kingdom Education Trust Fund)
- Skills: Coaxial bioprinting, enzymatic crosslinking, mechanical testing, polymer synthesis, microscopy (including confocal), immunoassays, histological sectioning and staining, sample preparation, experimental design, data collection, statistical analysis, documentation, scientific writing, literature review.

MSc in Biomedical Engineering

University of Bedfordshire [31/01/2012 – 31/07/2013]

City: Luton | **Country:** United Kingdom | **Website:** www.beds.ac.uk | **Level in EQF:** EQF level 7 | **Thesis:** Production of recombinant PI3K C2β Domain

- Departmental Prize Winner
- Skills: Polymerase chain reaction, restriction enzyme digestion, gel electrophoresis, cloning, sample preparation, experimental design, data collection, statistical analysis, documentation, scientific writing, literature review

BSc in Plant Science and Biotechnology (Major: Plant Biotechnology)

University of Port Harcourt [01/09/2005 – 28/04/2010]

City: Port Harcourt | **Country:** Nigeria | **Website:** www.uniport.edu.ng | **Level in EQF:** EQF level 6 | **Thesis:** Anatomical, physicochemical and cytological studies of Manihot esculenta

- Double Scholarship Recipient (NLNG & SPDC)
- Skills: Microscopy, sample preparation, histological sectioning and staining, experimental design, data collection, statistical analysis, documentation, scientific writing, literature review

Introduction to Artificial Intelligence

LinkedIn Learning [05/09/2024 – 05/09/2024]

Website: https://www.linkedin.com/learning/ | **Level in EQF:** EQF level 5

Data Management Bootcamp

University of Twente [20/06/2023 – 20/06/2023]

City: Enschede | **Country:** Netherlands | **Website:** https://www.utwente.nl/ | **Level in EQF:** EQF level 7

Originlab: Origin and OriginPro Masterclass

Udemy [10/01/2023 – 10/01/2023]

Website: www.udemy.com | **Level in EQF:** EQF level 5

Design of Experiments

Udemy [02/01/2022 – 02/01/2022]

Website: www.udemy.com | **Level in EQF:** EQF level 5

Biomaterials: Introductory Course for Beginners

Udemy [31/12/2021 – 31/12/2021]

Website: www.udemy.com | **Level in EQF:** EQF level 5

Introduction to Tissue Engineering

Udemy [31/12/2021 – 31/12/2021]

Website: www.udemy.com | **Level in EQF:** EQF level 5

Scientific Information: Searching, Managing and Publishing

University of Twente [03/06/2020 – 03/06/2020]

City: Enschede | **Country:** Netherlands | **Website:** https://www.utwente.nl/ | **Level in EQF:** EQF level 7

Data Analytics for Decision Making

FutureLearn/Bond University [15/07/2020 – 15/07/2020]

Website: https://www.futurelearn.com/ | **Level in EQF:** EQF level 6

LANGUAGE SKILLS

Mother tongue(s): English

Other language(s):

French	**Dutch**
LISTENING B1 **READING** B1 **WRITING** B1	**LISTENING** B1 **READING** B1 **WRITING** B1
SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A2	**SPOKEN PRODUCTION** A2 **SPOKEN INTERACTION** A2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

Knowledge-based

artificial intelligence / COMSOL / python (tool)

Technical

design principles / microscopy (confocal, fluorescence, phase contrast) / immunoassays / flow cytometry / rheology / good laboratory practice (not certified yet) / biomechanical testing / histological and imaging techniques (e.g., cellular composition analysis) / 2D and 3D cell culture (primary, stem and cell lines) / biofabrication / polymer synthesis / mac hine learning (in progress) / enzymatic and light crosslinking mechanisms / large animal experimentation (horses and ponies)

Soft

scientific communication (articles, presentations, posters) / project management, multitasking, and organizational skills / advanced experimental and laboratory skills / critical, analytical, and creative thinking / fast learning and problem-solving abilities / leadership, initiative, and independent work capacity / resilience, emotional intelligence, and interpersonal sensitivity / team collaboration and professional networking / fluent in English; working understanding of spoken and written French / attention to detail, reproducibility, and precision / teaching, lecturing, and mentorship experience / examination coordination and academic administration

Digital & Computational Skills

Microsoft office suite: word, excel, powerpoint, access / quantitative image processing (Fiji/ImageJ, CellProfiler) / Slide Model, BioRender, Adobe Illustrator / outlook / google drive / eLabJournal, long-term archive / graphing tools (GraphPad) / dropbox / origin / SPSS / zoom / bioinformatics tools

PUBLICATIONS

[2025]

Hydrogel-Based Bioinks for Coaxial and Triaxial Bioprinting: A Review of Material Properties, Printing Techniques and Applications

Authors: Alma Tamunonengiofori Banigo, Laura Nauta, Bram Zoetebier and Marcel Karperien | **Journal Name**: Polymers | **Volume, Issue and Pages**: 17,7,917 | **Publisher**: Polymers

Banigo et al, 2025, Hydrogel-Based Bioinks for Coaxial and Triaxial Bioprinting: A Review of Material Properties, Printing Techniques and Applications, Polymers, 17, 917.

[2025]

Injectable Hydrogels for Cartilage Tissue Engineering: Key Design Needs toward Clinical Applications

Authors: Alma Tamunonengiofori Banigo, Alex Nwekwo, Bram Zoetebier and Marcel Karperien | **Journal Name**: Academia Biology | **Volume, Issue and Pages**: 3,1, 1-21 | **Publisher**: Academia Biology

Banigo et al., 2025, Injectable Hydrogels for Cartilage Tissue Engineering: Key Design Needs toward Clinical Applications, Academia Biology, 3, 1-21.

[2024]

Coaxial Bioprinting of Enzymatically Crosslinkable Hyaluronic Acid-Tyramine Bioinks for Tissue Regeneration

Authors: Alma Tamunonengiofori Banigo, Laura Nauta, Bram Zoetebier and Marcel Karperien | **Journal Name**: Polymers | **Volume, Issue and Pages**: 16, 17, 1-16 | **Publisher**: Polymers

Banigo et al., 2024, Coaxial Bioprinting of Enzymatically Crosslinkable Hyaluronic Acid-Tyramine Bioinks for Tissue Regeneration, Polymers, 16, 1-16.

[2024]

Synthesis and Engineering of Hyaluronic Acid-Gelatin Hydrogels with Improved Cellular Attachment and Growth

Authors: Alma Tamunonengiofori Banigo, Irene Konings, Laura Nauta, Bram Zoetebier and Marcel Karperien | **Journal Name**: Polymers | **Volume, Issue and Pages**: 16, 23, 3410 | **Publisher**: Polymers

Banigo et al., 2024, Synthesis and Engineering of Hyaluronic Acid-Gelatin Hydrogels with Improved Cellular Attachment and Growth, Polymers, 16, 3410.

[2024]

Bioactive hydrogels based on Tyramine and Maleimide Functionalized Dextran for Tissue Engineering Applications

Authors: Lin Zhong, Alma Tamunonengiofori Banigo, Bram Zoetebier, Marcel Karperien | **Journal Name**: Gels | **Volume, Issue and Pages**: 10, 9, 566 | **Publisher**: Gels

Zhong et al., 2024, Bioactive hydrogels based on Tyramine and Maleimide Functionalized Dextran for Tissue Engineering Applications, Gels, 10, 566.

[2020]

Cissus Populnea Fiber - Unsaturated Polyester Composites: Mechanical Properties and Interfacial Adhesion

Authors: Azeez TO, Onukwuli DO, Nwabanne JT, and Banigo AT | **Journal Name**: Journal of Natural Fibers | **Volume, Issue and Pages**: 17, 9, 1281-1294 | **Publisher**: Journal of Natural Fibers

Azeez et al., 2020, Cissus Populnea Fiber - Unsaturated Polyester Composites: Mechanical Properties and Interfacial Adhesion, Journal of Natural Fibers, 17, 1281-1294.

NETWORKS AND MEMBERSHIPS

[2025 – Current]

Canadian Biomaterials Society

Member Number: Membership#C253208

[2020 – Current]

International Cartilage Regeneration & Joint Preservation Society

Member, ID:19356

[2020 – Current]

Tissue Engineering Regenerative Medicine International Society

Member, ID: 6477

CONFERENCES AND SEMINARS

[28/03/2023 – 31/03/2023] University of Manchester, United Kingdom

Tissue Engineering Regenerative Medicine International Society EU 2023 topic on "Broadening the Targets and Approaches for Regenerative Medicine"

Poster presentation on Hyaluronic Acid-Tyramine Bioink for Coaxial Bioprinting of Cell-Laden Filaments.

[28/06/2022 – 01/07/2022] Krakow, Poland

Tissue Engineering Regenerative Medicine International Society EU 2022 topic on "Perspectives and Challenges in Regenerative Medicine"

Poster presentation on Coaxial Bioprinting of Cell-Laden Core Filaments using a Hyaluronic Acid-Tyramine Bioink.

HONOURS AND AWARDS

[2020] Bonny Kingdom Education Trust Fund (BKETF), Nigeria

Nigerian Local Government PhD Scholarship Award

[2018] Federal University of Technology, Owerri, Nigeria

Best Class Advisor Award of the year

[2013] University of Bedfordshire, England, United Kingdom
Department of Life Science Prize for meritorious performance in MSc Biomedical Engineering

[2006] Shell Petroleum Development Company Limited, Nigeria
Undergraduate Scholarship Award

[2005] Nigerian Liquefied Natural Gas Limited, Nigeria
Undergraduate Scholarship Award

HOBBIES AND INTERESTS

Writing and Creative Pursuits
Creative writing (articles, essays, and books) and Innovative problem-solving in research.

Playing Games
Playing Chess and Scrabble for strategic thinking and relaxation.

Volunteering in STEM outreach
Advising students and improving science literacy

VOLUNTEERING

[2024 – 2024] Utrecht, Netherlands
BCF Career Event for Life Sciences (Member)
Coordinated CV Checks

RECOMMENDATIONS

Name: **Dr R.J.H. Custers** | Academic Mentor
-Available upon request.
Email: R.J.H.Custers-3@umcutrecht.nl

Name: **Ms. Laura Nauta** | Collaborator
-Available upon request.
Email: laura.nauta@hotmail.com

Name: **Dr. S.C. Uzoechi** | Academic Mentor and Former Senior Colleague
-Available upon request.
Email: scuzoechi@ncat.edu

Name: **Dr. E. Buick** | MSc Co-Supervisor
-Available upon request.
Email: Emma.buick@beds.ac.uk

Name: **Prof. M. Karperien** | PhD Promotor (Supervisor)
-Available upon request.
Email: marcel.karperien@utwente.nl

I declare that the written information provided is correct to the best of my knowledge, and I am fully committed to making positive contribution to the goals of your institution through project management, innovation, teaching, research and collaboration.

Enschede, Netherlands, 20/07/2025

Alma

Tamunonengiofori

Banigo