



# SKANDER HATHROUBI

## SENIOR RESEARCH SCIENTIST/ R&D MICROBIOLOGY/ PH.D IN VETERINARY SCIENCE AND BIOFILM EXPERT

38 years old  
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France

Microbiology and pathogenesis

Antibiofilm treatments and preventions

Antimicrobial biomaterials development

Coatings and hydrogels development

Senior research scientist specializing in R&D microbiology, with a Ph.D. in veterinary science and strong expertise in biofilms. Currently engaged at SPARTHA Medical, leading the microbiology laboratory and developing antimicrobial coatings and hydrogels for medical devices. Previously, held positions at the Humboldt-Universität zu Berlin (Germany) and the University of California, Santa Cruz (USA). My research encompasses a range of interdisciplinary projects, focusing on biofilm architecture, pathogenesis, and innovative treatments. Experienced educator and mentor, strongly contributing to the academic community through teaching, workshops, and publications.

## EXPERIENCES

### SENIOR R&D SCIENTIST & PROJECT LEADER IN MICROBIOLOGY

Spartha Medical - Since July 2022 - Full-time - Strasbourg - France



- Head of the microbiology laboratory. Multidisciplinary approach to develop new strategies to tackle the biofilm problem
- Developing versatile, personalized antimicrobial and anti biofilm coatings for medical devices.
- Project leader for an industrial co-development project
- Engaged in:
  - European project "ToxBox" (HORIZON-CL4-2023-RESILIENCE-01-101138387)
  - Regional project "KISSMat"

### SENIOR RESEARCH ASSOCIATE AND PROJECT LEADER

Humboldt-Universität zu Berlin - August 2019 to June 2022 - Berlin - Germany



- Investigating Esherichia coli macrocolony biofilms and their architectures. Role of cellulose and Curli. Interdisciplinary project (Cluster Matters of Activity) Laboratory of Prof. Regine Hengge
- Project leader: Bacterial cellulose from architectural and design perspectives
- Textile fermentation\_Biofilm and textile microbiome. Collaboration with the anthropology expert Dr. Laurence Douny

- "La récolte des biofilms" exhibition at the Humboldt Labor at Humboldt Forum\_2021 Active Curtain.« Humboldt Labor, Humboldt Forum Berlin. Since 29 April 2021.  
<https://www.humboldt-labor.de/en/projects/clusters-of-excellence/active-curtain-project>

"DAOULA sheen". West African Wild Silk on Its Way. Exhibition at the Tieranatomisches Theater Berlin Germany and Ougadougou-Safané, Burkina Faso. 17 November 2022 - 31 December 2022.  
<https://tieranatomisches-theater.de/project/ausstellung-ab-17-november-2022daoula-sheenwest-african-wild-silk-on-its-way/>

"Bacterial Cellulose: Co-Weaving Biofilms"

An Installation for the Triennale XXIII: »Unknown Unknowns, An Introduction to Mysteries« in the thematic exhibition »Alchemic Laboratory«, curated by Ingrid Paoletti, from July 15th to December 11th, 2022  
<https://www.matters-of-activity.de/en/activities/8617/bacterial-cellulose-co-weaving-biofilms>

- Book contribution:
  1. B. Beyer and S. Hathroubi. La récolte des biofilms. In: M@J : design, environnements techniques & pratiques exploratoires. Éditions Cité du design. École supérieure d'art et design Saint-Étienne (ESADSE)/Cité du design, France. 2021
  2. B. Beyer, S. Hathroubi and R Hengge Bacterial Loom. In: Architectures of Weaving From Fibers and Yarns to Scaffolds and Skins. Christiane Sauer / Mareike Stoll / Ebba Fransén Waldhör / Maxie Schneider (eds.) Jovis ISBN 978-3-86859-739-4
  3. L. Douny, S. Hathroubi, A. Dialo, A. Séré, S. Sawadogo and R. Hengge. West African "fermented" textiles. Submitted to Bloomsbury Encyclopedia of World Textiles



## POSTDOCTORAL RESEARCHER

Univeristy of California, Santa Cruz - November 2016 to June 2019

Investigating Helicobacter pylori biofilm formation and its potential role in pathogenesis in the lab of Dr. Karen Ottemann. Transcriptomic and genetic approaches to identify genes associated with H. pylori biofilm growth. Mouse-models for H. pylori infections and imaging approaches (CSLM and SEM) to characterize the biofilm structure its components.

Top publication:

S. Hathroubi, S. Hu and K. M Ottemann. Genetic requirement and transcriptomics of Helicobacter pylori biofilm formation on abiotic and biotic surfaces. npj Biofilms Microbiomes 6, 56 (2020)

S. Hathroubi, S. L. Servetas, I. Windham, D. S. Merrell, K. M Ottemann. Helicobacter pylori biofilm formation and its potential role in pathogenesis. Microbiol and Mol Biol Rev 82(2):e00001-18 (2018)

S. Hathroubi, J. Zerebinski and K. M Ottemann. Helicobacter pylori biofilm involves a multigene stress-biased response, including a structural role for flagella. mBio 9(5):e01973-18 (2018)

S. Tachiyama, K. L. Chan, X. Liu, S. Hathroubi, B. Peterson, M. F. Khan, K. M. Ottemann, J. Liu and A. Roujeinikova. The flagellar motor protein FliL forms a scaffold of circumferentially positioned rings required for stator activation. PNAS 119(4):e2118401119 (2022)

## TEACHING EXPERIENCES

University of California Santa Cruz \_UdeMontreal\_HU Berlin\_University of Strasbourg - Since May 2018

- Lecture Biofilm and its role in pathogenesis Master degree graduates. University of Strasbourg, Dentistry medical School (Fall session 2022)
- Teaching Molekulare Mikrobiologie (Modul BXY-36,5. Semester)  
Institut für Biologie, AG Mikrobiologie, Humboldt-Universität zu Berlin, Berlin, Germany- 2019-2020 and 2020-2021  
Seminar training, reading and lectures.  
Lectures: Bacterial biofilm and Bacterial pathogenicity
- Guest lecture microbiology and pathogenesis for undergraduates and graduates: Biofilm, the social life of microorganisms. University of California, Santa Cruz (Winter-Spring session 2018 and 2019)
- Microbiology and pathogenesis METX 119-02 online, summer session online classes: Biofilm, the social life of microorganisms. Univeristy of California, Santa Cruz (Summer 2018)
- Teaching course microbial pathogenesis 2 for Master's degree, veterinary science: Surface polysaccharides and envelope (Part\_1. Microbial envelope and Part\_2. Surface polysaccharides). Université de Montréal (Fall session 2015)

- Laboratory demonstrator for Master's degree, veterinary science students: Basic practical microbiology. Université de Montréal. (2012- 2015)

## MENTORSHIP EXPERIENCES

### At different locations - Since 2017

- Since 2022: Supervised two master student, one Bachelor student and co-supervising a Ph.D student at Strasbourg University
- Supervising Nicole Rackov for Bachelor thesis (Humboldt-universität zu Berlin) - December 2020 - June 2021
- Co-Supervising Nils Jensen, Master thesis (MPIKG and Humboldt-universität zu Berlin) - December 2020 - July 2021
- Supervising undergrad student Yasmine E. (University of California, Santa Cruz) - August 2018 - July 2019
- Supervising Ph.D student Aaron C. (University of California, Santa Cruz) - October 2017 - July 2019
- Supervising undergrad student Julia Z. (University of California, Santa Cruz) - October 2017-September 2018
- Supervising summer student Tyler Dewitt (University of California, Santa Cruz) - June-July 2017
- Supervising student internship Sarah-Eve Fontaine-Gosselin (University of Montreal) Bachelor of Life Science, Sherbrooke University) - January-May 2014

## ORAL COMMUNICATIONS

### Conferences - Since 2010

Invited speaker at Annual conference of the Inserm Unit 1121 November 2022

Invited speaker at the Nationwide Children's Hospital, Columbus, USA May 2022

Invited speaker at the Karolinska Institute, Stockholm, Sweden May 2022

Invited talk at Biofilm10 international conference, Leipzig, Germany May 2022

#Invited speaker for 'Textile: The Past and the Future of fashion', workshop Wissenschaftskolleg Berlin\_ the concept of Fermented textile 5 May 2022

Invited Speaker workshop 'Shelf life, Ferment-Activity', Berlin; Germany. 10 December 2020

Invited Speaker workshop 'Material as Environmental Device', Berlin; Germany. 10-11 September 2020

Invited speaker to 5th Workshop on bacterial and fungal biofilms, Ghent University conference Center. May 2019. Unraveling the mystery of Helicobacter pylori biofilm.

Invited speaker to INRS-INSTITUT ARMAND-FRAPPIER October 2018. Helicobacter pylori biofilm and the unexpected role of flagella.

Invited speaker to 2nd Technology Seminar-SandBox (UCSC\_Startup incubator) September 2018. Targeting the Helicobacter pylori impenetrable biofilm.

PBSE Research Conference 2018, Felton, California, USA. Unexpected role played by flagella during biofilm formation.

UC Biosafety officer meeting 2018, Santa Cruz, USA. New Insights into Helicobacter pylori biofilm.

WCBP Annual conference, 2017, Asilomar, California, USA. Novel genes associated with Helicobacter pylori biofilm growth.

CRIPA symposium, 2016, St-Hyacinthe, Québec, Canada. Actinobacillus pleuropneumoniae biofilms mitigate innate immune response.

ASM Biofilm, 2015, Chicago, USA. Actinobacillus pleuropneumoniae biofilms induce lower response of porcine alveolar macrophages.

CRIPA symposium, 2015, St-Hyacinthe, Québec, Canada. Effect of sub-inhibitory concentrations of penicillin G on Actinobacillus pleuropneumoniae biofilm formation.

Phd in 180sec (3MTMC) 2014, Science on stage, Faculté de médecine vétérinaire, St-Hyacinthe, Québec Canada. Best presentation 3rd prize. Rôle du biofilm dans la pathogénicité d'Actinobacillus pleuropneumoniae.

Congrès BiSP 2013, Université Laval, Québec, Canada. Rôle des polysaccharides de surface dans la formation du biofilm chez Actinobacillus pleuropneumoniae.

## MICROBIOLOGY RESEARCH INTERNSHIP

Groupe de recherche sur les maladies infectieuses du porc (GREMIP) - Since April 2011 - Internship - Saint-Hyacinthe - Canada

- Site-directed mutagenesis (allelic exchange)  
Immunodetection of extracellular polymeric substance (EPS)  
EPS extraction (eDNA...), Immunodot tests
- Biofilms culture in static and dynamic conditions: Drip flow reactor, BioFlux, MBEC assay, flowCell
- Enzymatic treatments on biofilms
- Macrophages in vivo Infection, PBMC isolation
- Lipid A extractions and structure analysis
- Microscopies

## MICROBIOLOGY RESEARCH INTERNSHIP

Centre National de Greffe de Moelle Osseuse, Faculté de médecine de Tunis - October 2009 to June 2010 - Internship - Tunis - Tunisia

- Antibiotic susceptibility tests and serotyping assay of *P. aeruginosa* clinical strains
- Static biofilm formation and enzymatic treatments  
Curcumin and berberine chloride test on biofilm
- Biofilm genes identification
- Swarming et twitching motility



## MICROBIOLOGY RESEARCH INTERNSHIP

Institut de Biologie Moléculaire et Médecine, Université Libre de Bruxelles - January 2009 to June 2009 - Internship - Bruxelles - Belgium

*E. coli* chromosomal toxin antitoxin systems identification by PCR  
Sequencing  
Phylogenetic analyses



## WEBMASTER

[www.bacterialbiofilms.com](http://www.bacterialbiofilms.com) - 2014 to 2016 - Freelancer - SAINT HYACINTHE - Canada - Québec

- Moved to <https://www.facebook.com/bacterialbiofilms/> since 2017
- Creating a website about the amazing world of biofilms [www.bacterialbiofilms.com](http://www.bacterialbiofilms.com)
- Developing a team of authors
- Interviews of several experts
- More than 550 monthly visitors

## LIBRARY ASSISTANT

Université de Montréal - September 2012 to 2016 - Temporary Work - Saint-Hyacinthe - Canada - Québec

- Assist students and teachers in location of print and non-print resources
- Check books and materials in and out to students and teachers using the computerized circulation system
- Monitor student use of the library
- Assist in maintaining the appearance of the library



## PROCTOR

Université de Montréal - Since September 2012 - Part-time - Montréal - Canada - Québec

Monitoring students during the writing of tests/exams

**MICROBIOLOGY**

- Microscopic identification, biochemical testing of bacteria ★★★★★
- Antibiotic susceptibility tests and serotyping assay ★★★★★
- Biofilms culture in static and dynamic conditions ★★★★★
- Enzymatic and chemicals treatments on biofilms ★★★★★
- Swarming et twitching motility tests ★★★★★

**CELL BIOLOGY**

- Cell culture, macrophages culture ★★★★★☆
- Cytokines detections (PCR and ELISA) ★★★★★☆
- PBMC isolation and proliferation ★★★★★☆
- Gastric gland isolation and imaging ★★★★★☆

**MICROSCOPIES**

- Biofilm staining and EPS detection ★★★★★☆
- 3D analysis (biomass, volume and thickness) ★★★★★☆
- SEM microscopy of biofilm and flagella detection ★★★★★☆

**MOLECULAR BIOLOGY**

- DNA and RNA extraction, PCR and RT-PCR
- Site-directed mutagenesis, RNA-seq (Transcriptomic)
- EPS extraction (eDNA...), LPS extractions, Lipid A micro-extractions
- Immunodetection of extracellular polymeric substance (EPS)

**ANIMAL EXPERIMENT**

- Mice infection and treatments
- Gastric gland isolation

- **May 2011 to September 2016** - Faculté de médecine vétérinaire, Université de Montréal - PhD in Veterinary Science, Microbiology and Infectious Disease  
Study of micro-organisms in their natural environment. Development of techniques for culturing bacteria from biofilms. Effect of antibiotics on biofilm. Immune response towards biofilms. Phenotypic changes in biofilms cells.  
GPA 3.85/4.3

Publications:

- 1\_ Bacterial biofilm derived-antigens: a new strategy for vaccine development against infectious diseases. A. Loera-Muro, A. Guerrero-Barrera, Y. D. N Tremblay, S. Hathroubi and C. Angulo. 2021. Expert Rev of Vaccines
- 2\_ Actinobacillus pleuropneumoniae: Role of biofilm in pathogenicity and potential impact for vaccination development. S. Hathroubi, A. Loera, J.T. Bossé, P.R. Langford and M. Jacques. 2017. Animal Health Research Review. (Published,7:1-14)
- 3\_ Actinobacillus pleuropneumoniae biofilms induce lower response of porcine alveolar macrophages. S. Hathroubi, C. Provost, C. A. Gagnon and M. Jacques. Innate immunity (<http://www.ncbi.nlm.nih.gov/pubmed/27226465>)
- 4\_ Biofilms: Bacterial shelters against antibiotics. S. Hathroubi, M.A Mekni, P. Domenico, D. Nguyen and M. Jacques. Microbial Drug Resistance (<http://www.ncbi.nlm.nih.gov/pubmed/27214143>)
- 5\_ Surface polysaccharide mutants reveal that absence of O antigen reduces biofilm formation of Actinobacillus pleuropneumoniae. S. Hathroubi, M.A. Hancock, J.T. Bossé, P.R. Langford, Y.D.N Tremblay, J. Labrie and M. Jacques. 2015. Infection and Immunity (<http://www.ncbi.nlm.nih.gov/pubmed/26483403>).
- 6\_ Sub-inhibitory concentrations of penicillin G induce biofilm formation by field isolates of Actinobacillus pleuropneumoniae. S. Hathroubi, S-È. Fontaine-Gosselin, Y.D.N. Tremblay, J. Labrie and M. Jacques. 2015. Vet Microbiology (<http://www.ncbi.nlm.nih.gov/pubmed/26130517>).
- 7\_ Les biofilms bactériens : leur importance en santé animale et en santé publique. Y.D.N. Tremblay, S. Hathroubi and M. Jacques. 2014. Canadian Journal of Veterinary Research (<http://www.ncbi.nlm.nih.gov/pubmed/24688172>).  
Research Workshop Viral biofilms  
Study of Actinobacillus pleuropneumoniae pathogen pork biofilm  
Mutagenesis and characterization of biofilm mutant

Communication during PhD program

The "viral biofilms" Out Of Context Seminar

Research Workshop pharmacokinetic / pharmacodynamic

- **September 2012 to November 2012** - Faculty of Health Sciences, University of Copenhagen - Certificate " Bacteria biofilms in chronic infections"  
Distinguish biofilms from planktonic bacteria both in nature and in medical related situations. Examine health care problems caused by infections involving bacterial biofilms. Design and develop biofilm models. Strategies for future research.
- **Since September 2011** - Université de Montréal - Training/Certification program for animal experimentation  
The Ethics of animal experimentation gives me the right to experiment on animals ifor laboratory research
- **September 2008 to June 2010** - Université Pierre Et Marie Curie, Paris 6, France - Master Applied Microbiology, Environment and Health  
A good understanding of microbiology ; bacteriology, virology, parasitology, environmental quality and health.  
Project communication: GENOTYPIC AND PHENOTYPIC CHARACTERIZATION OF BIOFILM PRODUCTION IN PSEUDOMONAS AEROGINOSA STRAINS IN THE BONE MARROW TRANSPLANT CENTER OF TUNIS, TUNISIA  
Training the Oceanological Observatory Banyuls-sur-mer  
Biodiversity and biotechnology to microorganisms
- **September 2005 to June 2008** - Université Pierre et Marie Curie, Paris 6 France - Bachelor of Life Sciences  
Scientific knowledge of biology and the general organisation of the animal and vegetable kingdoms as well as the functioning of organisms, from the molecular level to integrated biological systems.



## INTERESTS

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### INFORMATICS

- Photography; photo treatment Photoshop, ACDSee
- Adobe InDesign

### FOREIGN TRIPS

- 18 countries visited
- Road trips cross-country (Canada, USA)

### CRYPTOCURRENCY

- Ethereum (ETH) mining
- Trading crypto



## PORTFOLIOS

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### EXHIBITION AT THE TIERANATOMISCHES THEATER (GERMANY) AND OUGADOUGOU-SAFANÉ (BURKINA FASO).



DAOULA | sheen. West African Wild Silk on Its Way. Exhibition. Tieranatomisches Theater, Ougadougou and Safané, Burkina Faso. 17 November 2022 - 31 December 2022.

#### Website

<https://tieranatomisches-theater.de/project/ausstellung-ab-17-november-2022daoula-sheenwest-african-wild-silk-on-its-way/>

#### Creation date

17 Nov 2022

**XXIII TRIENNALE INTERNATIONAL EXHIBITION\_UNKNOWN UNKNOWN: AN INTRODUCTION TO MYSTERIES**



Website

<https://www.matters-of-activity.de/en/activities/8617/bacterial-cellulose-co-weaving-biofilms>

Creation date

08 Aug 2022

**THE PAST AND FUTURE OF FASHION 2022 AT WISSENSCHAFTSKOLLEG**





The concept of Textile fermentation and the role of bacteria in dyeing process. Photo credit goes to Laurence Douny

**Website**

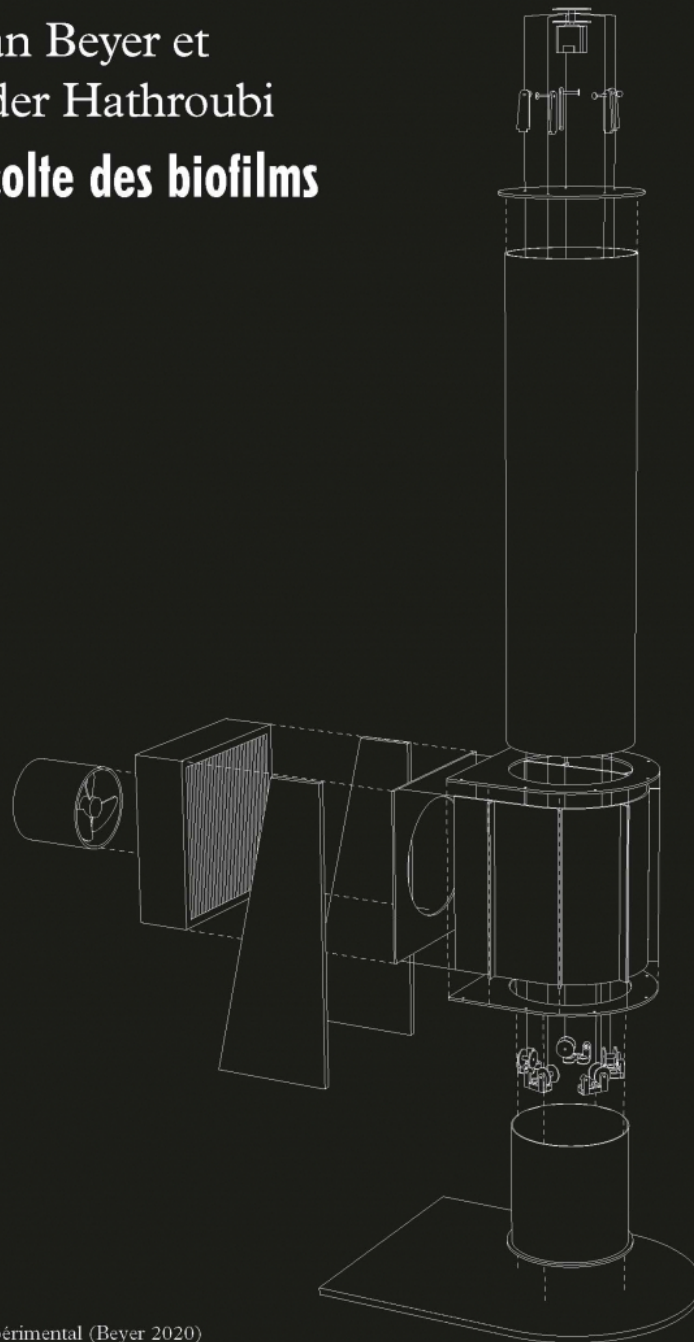
<https://www.wiko-berlin.de/veranstaltungen/workshops/2021/the-past-and-future-of-fashion>

**Creation date**

05 May 2022

**LA RÉCOLTE DES BIOFILMS\_BOOK PARTICIPATION**

**Bastian Beyer et  
Skander Hathroubi  
La récolte des biofilms**



Dispositif expérimental (Beyer 2020)

BASTIAN BEYER ET SKANDER HATHROUBI

B. Beyer and S. Hathroubi. La récolte des biofilms. In: Mâj : design, environnements techniques & pratiques exploratoires. Éditions Cité du design. École supérieure d'art et design Saint-Étienne (ESADSE)/Cité du design, France. 2021

"ACTIVE CURTAIN" \_ EXHIBITION "AFTER NATURE" AT HUMBOLDT LABOR AT HUMBOLDT FORUM\_2021



**Website**

<https://www.humboldtforum.org/en/programm/dauerangebot/exhibition/after-nature-16464/>

**Creation date**

01 Sep 2021