# Dr. Robyn Wright

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I finished my PhD at the University of Warwick (UK) in Biological Sciences (marine microbial ecology) in October 2019. I have now started a six month visiting postdoctoral fellowship at Dalhousie University, Nova Scotia, funded by an Association of Commonwealth Universities Blue Charter Fellowship. I am passionate about sustainability and mitigating anthropogenic impacts on the environment and am interested in using multi-OMIC approaches to studying microbial ecology and using big data to solve problems.

## CURRENT POSITION

**Visiting Postdoctoral Research Fellow**
Dalhousie University, Nova Scotia, Canada — Oct 2019-Apr 2020
The Association of Commonwealth Universities Blue Charter Fellow, in collaboration with Dr. Tony Walker (School for Resource and Environmental Studies) and Dr. Morgan Langille (Departments of Pharmacology and Microbiology and Immunology)
***Project:*** I am conducting a meta-analysis of the ~50 studies that analyze the marine "Plastisphere" – microbial communities found colonizing plastics – using amplicon sequencing. Through a re-analysis of the raw data from these studies, I am determining the key factors that are shaping these communities, including whether certain Plastisphere members are correlated with specific plastic types, locations or environmental parameters and if these are potential plastic-degraders, pathogenic species or opportunists.

## EDUCATION

**PhD Biological Sciences**
School of Life Sciences, University of Warwick, UK — 2015-2019
Funded by the Midlands Integrative Biosciences Training Partnership (MIBTP)
***Project:*** "Food or just a free ride? Exploring marine microbial community dynamics on natural and synthetic polymers."
*Supervisors:* Dr. Joseph Christie-Oleza (School of Life Sciences, now University of the Balearic Islands, Spain) and Prof. Matthew Gibson (Department of Chemistry and Warwick Medical School)
***Thesis research chapters:***

1. **Understanding microbial community dynamics to improve optimal microbiome selection –** Artificial selection of whole microbial communities was performed in order to increase the degradation rate of polymers in the marine environment, using chitin as a case study. The resulting microbial community changes and successional dynamics were characterized through MiSeq amplicon sequencing, allowing the optimization of this method.
2. **The PET Plastisphere: a multi-OMIC characterisation of marine PET-degrading isolates and analysis of microbial community succession –** Microbial community succession was characterised across six weeks of incubation with different types of the common packaging plastic, PET, and, through MiSeq amplicon sequencing, identifying key players that are indicative of community successional stages and different treatments. The pathways used by two bacterial isolates for PET degradation were also elucidated through genomics, proteomics and metabolomics.
3. **Plasticizer degradation by marine bacterial isolates: a proteogenomic and metabolomic characterization –** Characterization of the genomes, proteomes and metabolomes of two bacterial isolates was performed, allowing the identification of the mechanisms and enzymes used for the degradation of three plasticizers (plastic additives; dibutyl phthalate, bis(2-ethyl hexyl) phthalate and acetyl tributyl citrate).

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## EDUCATION

**PhD Biological Sciences (continued from previous page)**

***Additional projects:***

- **Aging of bacteria in biofilms, using an individual-based model to study growth –** This project expanded the previous work of the group, which used computational models (written in Java/Matlab) to study aging in bacteria, to models of bacteria growing/aging in biofilms. *Supervised by Dr. Jan-Ulrich Kreft, University of Birmingham, UK. Full time January to April 2016 and part time alongside other work until January 2020.*

**BSc Marine Biology (First Class, Hons.)**

University of Plymouth, UK 2010-2013

***Third year honors project:*** "Acute toxicity of DDT sorbed to uPVC plastic particles using Cytochrome P450 1A1 (Cyp1a) gene expression analysis in larval zebrafish"

*Supervisors:* Dr. Theodore Henry and Prof. Richard Thompson

## PUBLICATIONS

1. **Wright, R.**, Clegg, R., Coker, T. & Kreft, J-U. Damage repair is better than aging in biofilms (*Under revision for mSystems.* **IF 6.5**; link to preprint, link to conference abstract)
2. **Wright, R.**, Bosch, R., Gibson, M. & Christie-Oleza, J. (2020) Plasticizer degradation by marine bacterial isolates: a proteogenomic and metabolomic characterization. *Env. Sci. Technol.* **IF 7.1** (link to paper)
3. Erni-Cassola, G., **Wright, R.**, Gibson, M. & Christie-Oleza, J. (2019) Early colonization of weathered polyethylene by distinct bacteria in marine coastal seawater. *Microb. Ecol.* **IF 3.6** (link to paper)
4. **Wright, R.**, Gibson, M. & Christie-Oleza, J. (2019) Understanding microbial community dynamics to improve optimal microbiome selection. *Microbiome.* **IF 10.5** (link to paper)
5. Readman, J., DeLuna, F., Ebinghaus, R., Guzman, A., Price, A., Readman, E., Sheppard, A., Sleight, V., Sturm, R., Thompson, R., Tonkin, A., Wolshke, H., **Wright, R.** & Sheppard, C. (2013) Contaminants, Pollution and Potential Anthropogenic Impacts in Chagos/BIOT. *In: Coral Reefs of the United Kingdom Overseas Territories.* (link to chapter)

***In preparation*** (current manuscripts available on request):

- **Wright, R**. Bosch, R., Gibson, M. & Christie-Oleza, J. A multi-OMIC study of biodegradation and community succession within the PET Plastisphere (link to conference abstract; *Expected submission within one month*).
- **Wright, R.**[*], Erni-Cassola, G.[*], Zadjelovic, V., Latva, M. & Christie-Oleza, J. Ecology of the Plastisphere and recommendations for the future (*Invited review for FEMS Microbiology Ecology; [*] denotes co-first authorship; Expected submission within one month*).
- Latva, M., Polin, M., **Wright, R.**, Dedman, C. & Christie-Oleza, J. Early stage plastic colonisation and microbial community succession in the Mediterranean Sea (*Expected submission within three months*)
- **Wright, R.**, Langille, M. & Walker, T. A meta-analysis of the global Plastisphere reveals key taxa are associated with plastic type and environmental factors (*Expected submission within six months*).

***Not peer-reviewed***:

- **Wright, R.** (2019) Marine bacteria and the plastisphere. *Biological Sciences Review* (commissioned article for educational magazine aimed at 16-18 year-old biology students)

## CONFERENCE AND INVITED PRESENTATIONS

- ***Microbiology Society Annual Conference 2019*** (Belfast, UK) April 2019
  *Oral presentation 1*: "Food or a free ride? The ability of a marine microbial community to degrade plastics"
  *Oral presentation 2*: "Bacterial coping mechanisms for aging: using an individual-based model to study aging in biofilms"
- ***Invited panelist for "Plastic Pollution: Individual responsibility or beyond our control?"*** (University of Birmingham, UK) Mar 2019
- ***Warwick School of Life Sciences Postgraduate Symposium*** (Warwick, UK) Mar 2019
  *Oral presentation*: "Food or a free ride? The ability of a marine microbial community to degrade plastics"
- ***Molecular Microbial Ecology Group 2018*** (Swansea, UK) Dec 2018
  *Oral presentation*: "Food or a free ride? The ability of a marine microbial community to degrade plastics"

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## CONFERENCE AND INVITED PRESENTATIONS

- ***MICRO2018 Fate and Impact of Microplastics*** (Lanzarote, Spain) Nov 2018
  *Oral presentation*: "Can a microbial community biodegrade poly(ethylene terephthalate) (PET)?"
- ***15th Marine Biological Association Postgraduate Conference 2018*** (Plymouth, UK) May 2018
  *Oral presentation*: "Artificial ecosystem selection for marine polymer degradation"
- ***6th International Marine Debris Conference 2018*** (San Diego, USA) Mar 2018
  *Oral presentation*: "Artificial ecosystem selection for marine polymer degradation"
- ***Molecular Microbial Ecology Group 2017*** (Warwick, UK) Dec 2017
  *Oral presentation*: "Artificial ecosystem selection for marine polymer degradation"
- ***Warwick Manufacturing Group Seminar Series*** (Warwick, UK; invited) Mar 2017
  *Oral presentation*: "Plastic oceans – can microbes clean up our mess?"
- ***Microbiology Society Annual Conference 2017*** (Edinburgh, UK) April 2017
  *Flash oral presentation and poster*: "Is repair better than segregation of damage for aging cells in a biofilm?"
- ***ISCB Computational and Molecular Biology Symposium 2016*** (Dublin, Ireland) Dec 2016
  *Oral presentation*: "Aging of biofilms using a single-cell growth model"
- ***ERIC and SETAC joint annual meeting 2013*** (Plymouth, UK) Sep 2013
  *Poster presentation*: "Acute toxicity of DDT and expression of Cytochrome P450 1A1 (CYP1A1) gene transcripts in larval zebrafish"
- ***University of the Third Age*** (Plymouth, UK; invited) Apr 2013
  Presentation to retired academics on the sources and impacts of marine microplastics.

## KEY SCIENTIFIC SKILLS

- ***Bioinformatics and statistical analyses***: Linux servers for analysis of large datasets; Amplicon sequencing analysis including use of DADA2 in R, Mothur, QIIME1, and QIIME2 (DADA2 and deblur); Metagenome mining; Whole genome annotation and mining; Proteomics analysis; Python and R packages and analysis using custom scripts
- ***Analytical chemistry and metabolomics***: Fourier Transform-Infrared spectroscopy, Raman spectroscopy, High Pressure Liquid Chromatography-Mass Spectrometry
- ***Genomics***: DNA and RNA extraction; Library preparation and sequencing using the Illumina MiSeq platform (16S/18S/ITS rRNA gene amplicon sequencing); qRT-PCR; qPCR; Sanger sequencing
- ***Proteomics***: Preparation, sample processing and data analysis using Max Quant, Perseus, R and Python.
- ***Programming languages***: Python (proficient), R (intermediate), Java (familiar), Matlab (familiar)
- ***Microbiological***: Culturing, isolations, flow cytometry, enzymatic activity assays, aseptic techniques
- ***Computational modelling***: Development of computational models for bacterial growth using Matlab and an individual-based model written in Java (iDynoMiCS)
- ***Microscopy***: Transmission electron microscopy, fluorescent microscopy
- ***Supervisory***: Supervision of PhD, masters and undergraduate project students
- ***Other***: Boat (pelagic and benthic) and environmental sampling techniques for *e.g.* shoreline surveys

## PREVIOUS EMPLOYMENT EXPERIENCE

- **Visiting Postdoctoral Research Fellow** (Dalhousie University, Canada) *Oct 2019 – Apr 2020*
  See first page.
- **Demonstrator (teaching assistant)** (University of Warwick, UK) *Jan 2017 – Sep 2019*
  Demonstrator on undergraduate quantitative skills and statistics module. Involved working with students during workshops, assisting with suggestions for module improvement and marking of module assessments.
- **Research Showcase at University Open Days (University of Warwick, UK)** *Sep 2016 – Sep 2019*
  Design and running of a stall at open days that showcases ongoing research at the University and talking to prospective students and their families.
- **Supervisor** (University of Warwick, UK) *Dec 2016 – Sep 2019*
  Supervision of PhD, Masters and undergraduate students. This has involved assisting in the experimental design, implementation, write-up and marking for students on the Biological Sciences (BSc, Mbio and

## PREVIOUS EMPLOYMENT EXPERIENCE

- (Continued from previous page)
  MRes), Biochemistry (BSc) and Chemistry (MChem) courses as well as PhD students that started after me.
- **Recycling team assistant** (Internship; Waste Services, Coventry City Council) *Apr-Jul 2016*
  Involvement with: drafting policy proposals, health and safety reviews, updating the waste services website, audits of service areas, laying the groundwork for the implementation of new in-cab technology for waste collection drivers and assisting the 'Recycling Champions' with engaging the public and improving recycling rates in Coventry.
- **Research assistant** (Voluntary; Plymouth Marine Laboratories, UK) *May 2013 – Aug 2014*
  Work with Prof. Jim Readman and Dr. Eniko Kadar on the characterization of nanoplastics and plastic fragments from tumble driers and washing machines, using transmission electron and fluorescent microscopy, selective staining of particles and flow cytometry as well as the collection and spawning of mussels (*Mytilus* sp.).
- **Research assistant** (Plymouth University, UK) *Dec 2011 – May 2012*
  Work with Prof. Richard Thompson on the removal and identification (FT-IR spectroscopy) of plastic fragments from sediment samples sent from the Chagos Archipelago.

## PRIZES AND SUCCESSFUL GRANT/SCHOLARSHIP APPLICATIONS

- **The Association of Commonwealth Universities Blue Charter Fellowship** (£18,000/$32,000) 2019
  Funding for six months of research to be carried out at Dalhousie University, Canada; one of ten awardees across the Commonwealth
- **Prize for best seminar presentation** at Warwick School of Life Sciences postgraduate symposium 2019
  Voted for by staff as best presentation of ~35 final year PhD student oral presentations.
- **Microbiology Society travel grants** for 2016 and 2019 annual conferences (£500/$900) 2016/2019
  Funding for travel to conferences in Edinburgh and Belfast
- **FEMS travel grant** for Molecular Microbiology and Ecology Group meeting (£45/$80) 2018
  Registration fees for conference held at Swansea University
- **Competitive PhD program selection** by MIBTP (~£88,000/$155,000) 2015-2019
  British Biological Sciences Research Council (BBSRC) and Midlands Integrative Biosciences Training Partnership (MIBTP) funded Doctoral Training Partnership between the Universities of Warwick, Birmingham and Leicester. Funding included (annually) a stipend of ~£14,000 ($26,000), a research allowance of £4,000 ($7,000) and tuition fees of ~£4,000 ($7,000).
- **Inclusion on Dean's List for School of Marine Science and Engineering** 2011, 2012, 2013
  In recognition of exemplary academic performance during all years of BSc Marine Biology degree.

## OUTREACH AND OTHER ACTIVITIES

- Sponsored cycle to Belfast (total 500 km) for Microbiology Society Annual Conference 2019 (Blog post written for the Microbiology Society: Annual conference 2019: the road to Belfast) in order to raise awareness of the climate impact of conference travel (April 2019)
- Commissioned Biological Sciences Review (magazine aimed at 16-18-year-old biology students) article "Marine bacteria and the plastisphere" (April 2019)
- School of Life Sciences symposium organizing committee (2018-2019)
- Staff-student liaison committee, University of Warwick, UK (2018-2019)
- Oceans public science evening open science evening event held at the University of Warwick (2017)
- Science Technology Engineering and Maths (STEM) ambassador (2016-present)
- Surfers Against Sewage Area representative (organizing and attending beach cleans; 2011-2014)
- Plymouth marine city showcase volunteer representative for Plymouth University (2012) - educating adults and children on what microplastics are, the associated problems with their use and design and implementation of interactive activities.
- PADI advanced open water diver (2010)
- Full International driving license (December 2007)

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## PROFESSIONAL AFFILIATIONS

- Microbiology Society (UK; 2016-present)
- Royal Society for Biology (UK; 2016-present)
- Marine Biological Society (UK; 2016-present)

## REFEREES


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