



Dr Gary Barker
B.Sc.(E.Anglia), Ph.D.(Bristol)

Senior Lecturer

Area of research

Bioinformatics

Office Life Sciences: 2B17
Life Sciences Building,
24 Tyndall Avenue, Bristol BS8 1TQ
([See a map](#))

+44 (0) 117 39 41172
gary.barker@bristol.ac.uk

Summary

My research interests involve the application of bioinformatics to environmental genomics and crop Single Nucleotide Polymorphism (SNP) datasets. My interest in environmental genomics dates back to my PhD and postdoctoral work on gene flow in algae and cyanobacteria. In recent years I worked in collaboration with Keith Edwards group at Bristol to generate useful SNP markers for hexaploid bread wheat. I developed pipelines to mine inter-varietal SNPs from exome-capture sequence data and we went on to develop two commercial genotyping arrays from the ~1 million putative SNPs we found. These arrays are now used extensively by UK wheat breeders to rapidly screen new breeding lines at an early stage for markers linked to useful traits such as disease resistance and their impact has been to drastically reduce the time taken to naturally breed new wheat varieties. The advent of Next Generation Sequencing technology for DNA has made population-scale analysis of microbial communities tractable in recent years, which has enabled me to re-visit this area of my research. I currently have an EU-funded project to investigate micro-fouling of marine surfaces in which we are using high throughput sequencing for the identification of both taxa and genes associated with different anti-fouling compounds. I am also collaborating on projects using the similar techniques to study the microbial colonisation of retreating glacial fore-fields (in collaboration with Alex Anesio) and of humans who have received a nasal flu vaccine (in collaboration with Adam Finn). I am also working with Juliet Brodie at the Natural History Museum and Chris Yesson at the Institute of Zoology to develop genotyping by sequencing and novel sonar-based survey methods for UK kelps. I currently have a PhD vacancy funded by the EU to develop bioinformatics approaches to mine novel genes from cold environments.

Keywords

- Cereal Genomics
- Single Nucleotide Polymorphism
- metagenomics

Memberships

Organisations

[School of Biological Sciences](#)

Other sites

- [Brissybio](#)

Research groups

- [Plant and Agricultural Sciences](#)
- [Ecology and Environmental Change](#)

Labs

- [Cereal Genomics](#)

Recent publications

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