

## Ella Carter

### PhD Student

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Ella graduated from the University of Bristol with a Msci in Chemistry with industrial experience. She loved Bristol so much that she decided to stay and joined the BCFN cohort in 2017. During her placement year, Ella worked for Imerys in Cornwall, developing both rheology modifiers and non-woven materials. Her masters project was based in Professor Paul Bartlett's group, where she studied non-aqueous microgels by fluorescence confocal microscopy. Ella wishes to expand her knowledge in soft matter chemistry but is also interested in exploring new areas of research, particularly biological applications of nanotechnology.

#### **“DNA-Based Diagnostics and Delivery of Therapeutics for the Treatment of Gonorrhoea”**

Due to the rapid development of antibiotic resistance in *Neisseria gonorrhoeae*, the sexually transmitted disease, gonorrhoea, presents an ever-growing threat to global health. The main factor contributing to resistance in *Neisseria gonorrhoeae*, is its unique ability to acquire and incorporate DNA from members of the same species, via recognition of a specific DNA Uptake Sequence (DUS) motif present in gonococcal DNA. In this project, the DUS will be exploited for the development of a diagnostic and therapeutic against gonorrhoea. In the first instance, gold nanoparticles functionalised with DUS-containing DNA, will be used to detect gonococcal DNA. This will form the basis for a rapid, point-of-care diagnostic. Later, to tackle the diminishing treatments options available for gonorrhoea, novel therapeutics will be investigated. For this, the DUS will be conjugated to gold nanoparticles and antibiotics, to provide targeted delivery of therapeutics.