Safety in the Lab

Safe practice is paramount, especially when working within a laboratory. There were several precautionary steps which we followed throughout the summer. An overview can be seen here:

- Training

  On the 10th of July, the whole team received a full lab induction in which we learnt about the risks involved with working in a lab. For the biologists and our chemist, this acted as a good revision session, but for the engineers on our team, it was crucial training. We all signed COSHH safety forms and were given a safe practices handbook for future reference. We eliminated the risk of contamination by having a designated 'dry lab' space for laptops, lab books etc.

- PPE – Personal Protective Equipment

  Lab coats, latex gloves and goggles were distributed. Not only do these items help us to comply with health and safety procedures, but they also help us to maintain a sterile working environment, which is crucial for molecular biology. Win win!

- Protocols

  One of Elsa's many roles was to make comprehensive protocols for each experiment, and she did a fantastic job of making them easy to follow (even by the engineers!) This helped us to make sure that every step was followed correctly, thus minimizing room for error.

- BioHazrds

  As we were working with E.coli, which is considered a biological hazard, we were careful to follow all safety procedures. We ensured that all surfaces were cleaned with ethanol before and after lab procedures, washed our hands thoroughly on leaving the lab, and disposed of contaminated items safely,.

- General

  Every team member was made aware of where first aid equipment was located and who our closest first aid trained member of staff was. We were also given training on fire procedures and accident reporting.

Education & Public Engagement

For our "B.I.T.E.S" outreach day, we invited A-level students from the surrounding area to attend a biomechanical engineering workshop, and a microbiology lab. In preparation for this, we completed two separate risk assessment forms which evaluated the hazards and potential risks which could arise throughout the day. We then outlined the controls needed to minimize these risks and compiled a full risk assessment which was then agreed with our supervisors. The students were informed of this risks and given full training before starting each activity.

Project Design

Our chassis Organism was *E. Coli K-12 DH5a.* This meant that our transforms could be performed with high efficiency. Regarding safety, K-12 lacks several genes which would normally confer E. coli pathogenicity.

Escherichia coli K-12 and its derivatives, in our case DH5alpha, are classified by the World Health Organization as 'Risk Group 1' : organisms are of low risk and generally do not cause disease in healthy adult humans.

Biofilm manipulation performed on cells posed no potential threat or risk.

Although we didn't quite manage to prototype our design, we had several precautionary measures in place. Upon completion of our cellulose structure, we proposed to screen the finished product with UV light. This would make the surface aseptic, ready for implantation. To try and minimize the risk of antimicrobial resistance, our antibiotic 'tag' would be of high concentration and activation would only occur whilst in the presence of bacteria.