

## **Application 1**

**Title:** An exploration of the gluten gap in healthcare practice and clinical education

### **Summary:**

My postgraduate dissertation/thesis will look at what I believe to be the gap in clinical education for doctors, nurses and other health professionals about some of the lesser-known effects of living with coeliac disease or gluten related disorders including neurological problems and impacts on mental health and problems such as depression or issues with fertility or pregnancy complications.

This aligns to the research priorities for Coeliac UK as it would help professionals provide people living with coeliac disease with better support post diagnosis whilst also promoting greater professional understanding of some of the neurological complications and links to other conditions (Coeliac UK research priorities 3, 5 and 6).

I am a health professional and work in higher education, and I have over several years worked on some mental health projects and been astounded that the other health professionals know little about coeliac disease and gluten and how it can impact on health issues outside of the digestive system including neurological complications and mental health. I am also very interested in reproductive health and the impacts of coeliac disease on that in both men and women and there also seems little awareness of this amongst health professionals even though infertility and baby loss have profound consequences for those affected.

I have been actively researching these areas for a number of years and published several research articles, textbooks and book chapters on these topics in an attempt to establish the evidence and also improve knowledge of the associations amongst health professionals.

## Application 2

**Title:** Investigating butyrophilin polymorphism and T cell immunity as a tool for predicting coeliac disease risk

### Summary:

Butyrophilins are a family of related proteins that are found on the surface of cells. Little is known of their exact functions. Some butyrophilins communicate with immune cells, called T cells. During an infection, T cells are activated and attack the infection. However, the immune system is a double-edged sword. Our T cells can attack our own tissues, causing an autoimmune disease. In coeliac disease, T cells in the small intestine misfire and damage the small intestines.

Recent research suggests that some butyrophilins disappear from the small intestine and the behaviour of the small intestinal T cells change in coeliac disease.

As butyrophilins interact with T cells in the small intestine, my aim is to look at the hereditary material (DNA) of each patient to see if they have any common variations in the code for their butyrophilins. This will help us learn more about the communication between T cells and these proteins and better understand the genetic risks for coeliac disease.

I have access to tissue samples from people with and without coeliac disease, so I can analyse their DNA. I will also investigate the predicted butyrophilin protein shapes, using available computer-based models, so that I can compare the predicted shapes of butyrophilins between people with coeliac disease and those without. As the shape of a protein is important to its functions, this will tell us more about the communication between butyrophilins and T cells in patients with coeliac disease. I will also try to identify any change in the behaviour in the T cells of patients with coeliac disease and investigate how that might relate to the variation in patient DNA.

If I find common patterns in the DNA of patients with coeliac disease, this could be used as a less invasive tool to assess the risk of an individual developing coeliac disease or possibly even a diagnostic test for the condition. As DNA is found in all cells of the body and does not change depending on diet, a simple blood test could be used to test for these patterns, which is less invasive than an endoscopy and does not require the person to eat gluten.

### Application 3

**Title:** Educating the educator: an evaluation of the lived experiences, quality of life and support for adolescents with coeliac disease in schools.

#### Summary:

There are a number of challenges faced in school by adolescents with coeliac disease (CD). The symptoms of CD such as bloating, diarrhoea, wind, constipation and weight loss can be upsetting and embarrassing. The constraints of a gluten free diet (GFD) can be hard to accept. Other issues include bullying, discrimination, isolation and risk for gluten exposure. The impact on health related quality of life (QOL) of adolescents can be significant.

There is currently a lack of research into whether support for adolescents with CD in schools is adequate to address their needs. The increase in emotional and behavioural problems in adolescents with CD emphasises the importance of improving post diagnosis support and patient care. These are top research priorities of Coeliac UK. This project supports these research priorities by evaluating post diagnosis support available in schools.

This project aims to benefit adolescents with CD and their parents by highlighting the need for more support and awareness of CD in schools. The focus will be to underpin how adolescents feel about being at school with CD and how safe parents feel about leaving their child at school. Hopefully, this study will help recognise where more support is needed. Policies and practices could then be improved to gain this support. The aim is to make even a small difference. If teachers and classmates gain better understanding of CD and become more aware of the issues faced by adolescents living with this condition, adolescents with CD may feel more at ease in school. Ultimately, going through school with CD should never mean that you are treated any differently to other students; all students should be able to enjoy the same school experience.

I have lived with CD since the age of five. I would take pride in doing research for Coeliac UK and helping to benefit the lives of adolescents, and their parents, who will be facing the same challenges as me and my parents after my diagnosis. I have witnessed an immense change in research and knowledge since my diagnosis. From what seemed very little knowledge at the start of my diagnosis, the research is rapidly growing. Like Coeliac UK, I believe more research is needed. My research will allow adolescents with CD and their parents to have their say and hopefully, it can help towards the goal of Coeliac UK: that one day no one's life will be limited by gluten.