Title: Clonal expansion of B cells in active autoimmune disease

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Abstract

Dermatitis herpetiformis (DH) is a chronic autoimmune skin condition manifesting as itchy blisters in the extremities of the body with characteristic IgA deposition in the papillary dermis. It is thought to develop from untreated celiac disease (CD) and both forms of the disease are gluten induced. Although DH manifests as a rash, it is though that the immune responses responsible for the skin symptoms might originate from the gut, in the form of antibodies and/or circulating immune cells (PBMCs). Both DH and CD patients present with autoantibodies against transglutaminase(TG)2 , and DH patients additionally antibodies targeting TG3.Both antibodies are produced by plasma cells residing in the small bowel.

In order to understand the possible connection between skin symptoms and intestinal pathology, we conducted BCR sequencing of DH patient small intestine biopsies and peripheral blood immune cells (PBMCs) during a gluten challenge. On day 6 after a short gluten challenge, in PBMCs, the number of unique clonotypes was significantly higher than before gluten challenge. Amount of shared clonotypes between patients was also increased on day 6. Biopsy samples exhibit slightly broader light chain gene usage than PBMCs.

These results indicate that 6-day gluten challenge elicit clonal expansion of B cells in DH. These BCRs preferentially use certain light chain genes, similarly to what has been reported for CD patients. Further analyses on antigen-specific BCRs will shed light on the possible differences between DH and CD.