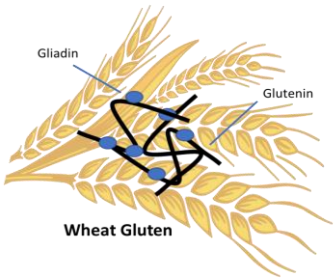
# Food Allergy: Gluten

Celiac Disease (CD), an allergic reaction against gluten, is not considered urgent as it does not induce anaphylactic shock. However, for sensitive individuals, repeat gluten exposure can damage the small intestine, resulting in chronic inflammatory conditions. CD is often a misdiagnosed autoimmune disorder and no definitive treatment for CD exists (1).

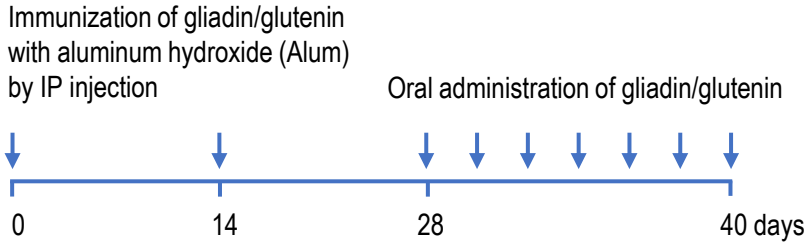



## Celiac Disease Model

Many protocols have been published for inducing mouse CD models for wheat-gluten allergy. The following are sample protocols for allergen challenge procedures using gliadin or glutenin (gluten allergens) which are evaluated for humoral immune responses such as serum anti-gliadin IgE and IgG1 antibodies and intestinal permeability (2, 3).

### 1) Immunization and Oral Sensitization Model (3, 4)

BALB/c mice are sensitized twice, 2 weeks apart, with 50 µg of gliadin or glutenin adsorbed to 1 mg of aluminum hydroxide by intraperitoneal injection. Two weeks after the second sensitization, the mice are orally administered 10 mg of gliadin or glutenin in water via an intragastric feeding needle every other day for a total of seven times.




Evaluation:

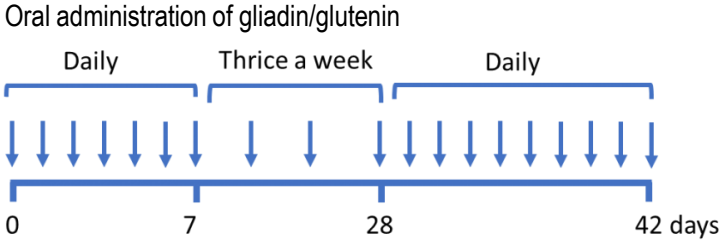
- Intestinal permeability
- Serum gliadin/glutenin-specific IgE/IgG1 levels
- Serum gliadin/glutenin peptide levels
- Serum histamine levels

### 2) Immunization Only (5)

BALB/c mice are sensitized with 10 µg of gliadin or glutenin adsorbed to 3% aluminum hydroxide by intraperitoneal injection at days 0, 10, 20 and 30.

### 3) Oral Immunization Only (6)

BALB/c mice are challenged by oral gavage with gliadin or glutenin (5 mg/day for 1 week, then 5 mg/day thrice a week for 3 weeks) for 4 weeks. At the end of the fourth week, the mice are challenged with gliadin or glutenin every day via oral gavage for another 2 weeks.



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It is important to evaluate the ratio of anti-allergen IgE antibody levels to total IgE (non-specific) levels which are also elevated in successfully developed mouse allergy models. Chondrex, Inc. offers the following ELISA kits which can evaluate humoral immune responses in mouse allergic models. For more information about these kits, please visit www.chondrex.com or contact support@chondrex.com.

## Antibody Assay Kits

| Products | Catalog # Anti-Gliadin | Catalog # Anti-Glutenin | Catalog # Total Immunoglobulin |
|---|---|---|---|
| IgG Antibody Assay | 3051 | 3092 | 3023 |
| IgG1 Antibody Assay | 3052 | 3093 | 3025 |
| IgG2a Antibody Assay | 3053 | 3094 | 3026 |
| IgG2b Antibody Assay | 3054 | 3095 | 3027 |
| IgG3 Antibody Assay | Coming soon! | - | 3028 |
| IgM Antibody Assay | 3055 | 3096 | 3024 |
| IgA Antibody Assay | Coming soon! | - | 3019 |
| IgE Antibody Assay | 3050 | 3104 | 3005 |

*Individual monoclonal antibodies against allergens are also available. Please visit www.chondrex.com for more information.

## Antigen Detection Kits

| Products | Catalog # |
|---|---|
| Gliadin Detection Kit | 6035 |
| Glutenin Detection Kit | 6052 |
| Mouse Mast Cell Protease-1 (MCPT-1) Detection Kit | 6046 |

## References


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6. E. Ferrari, R. Monzani, V. Saverio, M. Gagliardi, E. PaÅ„czyszyn, V. Raia, V. R. Villella, G. Bona, M. Pane, A. Amoruso, M. Corazzari, Probiotics Supplements Reduce ER Stress and Gut Inflammation Associated with Gliadin Intake in a Mouse Model of Gluten Sensitivity. Nutrients. 13 (2021)