intermittent fasting for fatty liver

Intermittent Fasting for Fatty Liver: A Comprehensive Guide

Intermittent fasting for fatty liver represents a promising dietary approach for managing and potentially reversing Non-Alcoholic Fatty Liver Disease (NAFLD). This condition, characterized by the accumulation of excess fat in the liver, affects a significant portion of the global population and can progress to more serious liver damage. Intermittent fasting (IF), a pattern of eating that cycles between periods of voluntary fasting and non-fasting, has shown remarkable potential in addressing the metabolic dysfunctions that drive NAFLD. This article delves into the science behind IF, its mechanisms of action, the different fasting protocols suitable for fatty liver management, potential benefits, important considerations, and how to implement it safely. Understanding the intricate relationship between fasting, metabolic health, and liver function is crucial for individuals seeking effective, lifestyle-based interventions for fatty liver disease.

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Understanding Non-Alcoholic Fatty Liver Disease

(NAFLD)

Non-Alcoholic Fatty Liver Disease (NAFLD) is a spectrum of liver conditions characterized by the buildup of excess fat in the liver, not caused by excessive alcohol consumption. It is strongly linked to metabolic syndrome, obesity, insulin resistance, and type 2 diabetes. NAFLD can range from simple fatty liver (steatosis), where fat accumulates but there is little to no inflammation or liver cell damage, to more severe forms like non-alcoholic steatohepatitis (NASH), which involves inflammation and liver cell damage that can lead to fibrosis, cirrhosis, and liver cancer.

The underlying mechanisms of NAFLD are complex but primarily involve increased fatty acid synthesis, decreased fatty acid oxidation, and impaired triglyceride export from the liver. Insulin resistance plays a pivotal role, leading to increased lipolysis in adipose tissue and promoting hepatic de novo lipogenesis. This excess fat in the liver disrupts normal liver function, contributing to inflammation and oxidative stress, which can perpetuate the damage over time.

Diagnosing NAFLD typically involves blood tests to assess liver enzymes, imaging studies like ultrasound, and sometimes a liver biopsy for definitive diagnosis and staging. Lifestyle modifications, including diet and exercise, are the cornerstone of management. Addressing the metabolic derangements associated with NAFLD is key to preventing its progression and improving liver health.

What is Intermittent Fasting (IF)?

Intermittent fasting (IF) is not a diet that dictates what you eat, but rather an eating pattern that dictates when you eat. It involves cycling between periods of voluntary fasting and non-fasting within a given timeframe. Unlike traditional diets that focus on calorie restriction across the entire day, IF emphasizes strategic timing of meals. This approach can lead to significant metabolic changes that are beneficial for conditions like fatty liver disease.

The core principle of IF is to give the body extended periods without food, allowing it to shift from using readily available glucose for energy to tapping into stored fat reserves. During fasting periods, insulin levels drop, which facilitates fat breakdown and the release of stored energy. This metabolic shift is crucial for reducing fat accumulation in the liver and improving overall metabolic health. Different IF protocols exist, catering to various lifestyles and preferences.

The popularity of IF has surged due to its perceived simplicity and its documented effects on weight loss, improved insulin sensitivity, and enhanced

cellular repair processes like autophagy. When applied thoughtfully, IF can be a powerful tool for individuals looking to address underlying metabolic issues contributing to fatty liver.

How Intermittent Fasting Helps Fatty Liver

Intermittent fasting exerts its beneficial effects on fatty liver disease through several key metabolic and cellular mechanisms. By strategically creating periods of fasting, IF influences hormonal balance, cellular energy utilization, and inflammatory pathways, all of which play a role in the development and progression of NAFLD.

One of the primary ways IF aids fatty liver is by improving insulin sensitivity. During fasting periods, insulin levels decrease, allowing the body to access stored fat for energy. This repeated reduction in insulin levels can help overcome insulin resistance, a major driver of NAFLD. When insulin sensitivity improves, the liver is less likely to convert excess glucose into fat through a process called de novo lipogenesis, and it can more effectively utilize glucose.

Furthermore, IF promotes lipolysis, the breakdown of stored triglycerides in fat cells. This released fatty acid can then be utilized by other tissues for energy, thereby reducing the overall fat burden in the body, including the liver. Studies suggest that IF can lead to a reduction in liver fat content and improvements in liver enzymes.

Cellular mechanisms like autophagy also contribute to IF's benefits for fatty liver. Autophagy is a cellular 'clean-up' process where cells remove damaged components and recycle them. Fasting stimulates autophagy, which can help clear out accumulated fat droplets and damaged organelles within liver cells, promoting cellular health and function. Additionally, IF can reduce systemic inflammation and oxidative stress, factors that exacerbate liver damage in NAFLD.

Metabolic Shifts During Fasting

During the fasting state, the body undergoes a significant metabolic shift. After approximately 8-12 hours without food, the body depletes its readily available glucose stores in the form of glycogen. Once glycogen stores are low, the body switches its primary fuel source from glucose to fatty acids and ketone bodies. This transition is crucial for fat loss and improving metabolic flexibility.

The hormonal environment also changes. Insulin levels drop significantly during fasting, while glucagon, a hormone that mobilizes stored energy,

rises. This hormonal interplay promotes lipolysis (fat breakdown) in adipose tissue. The released fatty acids can then be transported to the liver and other tissues to be used for energy. This increased utilization of fat as fuel helps to reduce the accumulation of triglycerides in the liver.

Impact on Insulin Resistance

Insulin resistance is a hallmark of metabolic syndrome and a primary contributor to NAFLD. Intermittent fasting has been shown to improve insulin sensitivity by reducing circulating insulin levels and enhancing the body's response to insulin. During fasting, the absence of food intake allows the pancreas to rest, reducing the constant demand for insulin production.

With lower baseline insulin levels and improved cellular responsiveness, the body becomes more efficient at managing blood sugar. This reduction in insulin resistance can directly impact the liver, decreasing its production of glucose and its conversion of excess carbohydrates into fat. Over time, this can lead to a significant reduction in hepatic steatosis.

Reducing Hepatic Fat Accumulation

The direct impact of IF on reducing fat within the liver is a key benefit for those with NAFLD. By promoting fat oxidation and reducing de novo lipogenesis, IF effectively curbs the influx of triglycerides into liver cells. The improved insulin sensitivity further contributes by signaling the liver to reduce its own fat production.

Studies utilizing imaging techniques have demonstrated that individuals practicing IF can experience a significant decrease in liver fat content over weeks to months. This reduction in hepatic steatosis not only alleviates symptoms but also lowers the risk of progression to more severe forms of liver disease like NASH and fibrosis.

Popular Intermittent Fasting Protocols for Fatty Liver

Several intermittent fasting protocols can be adapted for managing fatty liver disease, each offering a different approach to structuring eating and fasting windows. The choice of protocol often depends on individual lifestyle, commitment level, and tolerance. It's important to note that consistency is key, and finding a sustainable pattern is paramount for long-term success.

When considering IF for fatty liver, the primary goal is to create enough fasting time to trigger beneficial metabolic shifts without compromising nutrient intake during the eating window. The focus should always be on consuming a nutrient-dense, balanced diet during the non-fasting periods to support overall health and liver function.

The 16/8 Method

The 16/8 method, also known as time-restricted eating, is one of the most popular and accessible IF protocols. It involves fasting for 16 hours each day and restricting your eating to an 8-hour window. For example, you might choose to eat between 12 PM and 8 PM, fasting from 8 PM to 12 PM the next day.

This protocol is often easier to adhere to as it typically involves skipping either breakfast or dinner, allowing for three meals within the eating window for many people. The 16-hour fasting period is sufficient to trigger metabolic shifts, including reduced insulin levels and increased fat burning, which can be beneficial for reducing liver fat. It also allows for a prolonged overnight fast, which is crucial for liver detoxification and repair processes.

The 5:2 Diet

The 5:2 diet involves eating normally for five days of the week and significantly restricting calorie intake on two non-consecutive days. On these "fasting" days, individuals typically consume around 500-600 calories. This approach offers more flexibility for social events and daily routines on the majority of days.

While not a traditional daily fasting window, the calorie restriction on two days a week can induce metabolic changes that are beneficial for fatty liver. The reduced calorie intake can lead to an overall caloric deficit, promoting weight loss, which is crucial for NAFLD management. It also allows for periods of reduced metabolic demand, giving the liver a break from constant processing.

Eat Stop Eat

Eat Stop Eat is a protocol that involves a 24-hour fast once or twice a week. For example, you might finish dinner on Monday and then not eat again until dinner on Tuesday. This means you are fasting for a full 24 hours. The remaining days of the week are spent eating normally.

This method provides a more significant fasting period, which can lead to more pronounced metabolic benefits. A 24-hour fast can powerfully reduce insulin levels and boost fat burning. It encourages the body to become more efficient at utilizing stored energy. However, it requires more discipline and planning to manage hunger and ensure adequate nutrient intake on non-fasting days.

Benefits of Intermittent Fasting for Fatty Liver

The adoption of intermittent fasting for fatty liver offers a multifaceted approach to improving liver health and addressing the underlying metabolic issues. The benefits extend beyond just reducing liver fat, impacting overall metabolic well-being and potentially preventing disease progression.

One of the most significant advantages is the improvement in metabolic markers. By enhancing insulin sensitivity, IF can help regulate blood sugar levels, which is crucial for individuals with or at risk of type 2 diabetes, a common comorbidity with NAFLD. This improved glycemic control reduces the burden on the liver and promotes a healthier metabolic environment.

Beyond metabolic improvements, IF also plays a role in weight management. Many individuals find that IF helps them naturally reduce their overall calorie intake, leading to gradual and sustainable weight loss. Losing excess weight, particularly abdominal fat, is highly effective in reducing liver fat and improving NAFLD. This comprehensive approach to health can have farreaching positive effects.

- Reduced Liver Fat Accumulation
- Improved Insulin Sensitivity and Blood Sugar Control
- Weight Loss and Reduced Body Fat
- Decreased Inflammation and Oxidative Stress
- Enhanced Cellular Repair (Autophagy)
- Improved Cholesterol and Triglyceride Levels
- Potential Prevention of NAFLD Progression

Weight Loss and Reduced Body Fat

Weight loss is a critical component in managing Non-Alcoholic Fatty Liver Disease. Intermittent fasting can be a powerful tool for achieving this. By restricting the eating window, individuals often consume fewer calories overall without feeling overly deprived, as the focus is on the timing of meals rather than strict food restrictions. This can lead to a sustained caloric deficit, promoting fat loss.

Specifically, IF can help reduce visceral fat, the type of fat that accumulates around abdominal organs and is strongly linked to metabolic dysfunction and NAFLD. As the body taps into stored fat for energy during fasting periods, it systematically reduces fat reserves, including the fat deposited in the liver. This reduction in body fat is directly correlated with improved liver enzyme levels and a healthier liver.

Improved Lipid Profile

Individuals with fatty liver disease often exhibit an unfavorable lipid profile, characterized by high triglycerides and low HDL ("good") cholesterol. Intermittent fasting has shown promise in improving these markers. The metabolic shifts induced by fasting, such as increased fat oxidation and reduced glucose-driven lipogenesis, can lead to lower triglyceride levels.

Furthermore, by improving insulin sensitivity and promoting weight loss, IF can indirectly contribute to a healthier lipid profile. A more metabolically healthy state generally leads to better regulation of cholesterol and triglyceride synthesis and metabolism, ultimately benefiting cardiovascular health and reducing the overall metabolic burden on the body.

Reduced Inflammation and Oxidative Stress

Chronic inflammation and oxidative stress are key drivers of liver damage in NAFLD, particularly in its progression to NASH. Intermittent fasting has demonstrated anti-inflammatory effects and can help mitigate oxidative stress. By reducing fat accumulation in the liver and improving metabolic parameters, IF can lessen the cellular stress that leads to inflammation.

Fasting periods can activate cellular pathways that reduce the production of inflammatory cytokines and reactive oxygen species. This protective effect can help preserve liver cells from damage and slow down or even reverse the fibrotic process associated with NASH. The overall effect is a more resilient and healthier liver environment.

Potential Risks and Side Effects of Intermittent Fasting

While intermittent fasting offers significant benefits for fatty liver management, it is not without potential risks and side effects. It is crucial to approach IF with an understanding of these possibilities to ensure a safe and effective implementation. These side effects are often transient and can be managed with proper guidance.

Common initial side effects include hunger, headaches, fatigue, and irritability as the body adjusts to the new eating pattern. For some individuals, these symptoms can be mild and subside within a few days. However, for others, they may persist or be more pronounced, requiring adjustments to the fasting protocol or a reevaluation of its suitability.

More serious concerns can arise if IF is not implemented correctly or if there are underlying health conditions. It is vital to be aware of these risks and to consult with a healthcare professional before starting IF, especially if you have pre-existing medical conditions or are taking medications.

- Headaches
- Fatigue
- Irritability
- Dizziness
- Nausea
- Digestive Issues (e.g., constipation, bloating)
- Sleep Disturbances
- Potential for nutrient deficiencies if not planned correctly

Managing Hunger and Cravings

The most common challenge individuals face when starting intermittent fasting is managing hunger and cravings. During the initial adjustment period, the body is adapting to a new feeding schedule, and the sensation of hunger can be intense. However, this is often a physiological response that can be

managed with strategic planning.

Staying hydrated is paramount, as thirst can often be mistaken for hunger. Drinking plenty of water, herbal teas, or black coffee can help suppress appetite. Focusing on nutrient-dense foods during the eating window, rich in protein, fiber, and healthy fats, can promote satiety and reduce cravings. Planning meals and snacks in advance can also prevent impulsive, unhealthy food choices when hunger strikes.

Electrolyte Imbalances and Dehydration

During fasting periods, particularly longer ones, there is a risk of electrolyte imbalances and dehydration if fluid and electrolyte intake is not adequately managed. This can manifest as headaches, dizziness, fatigue, and muscle cramps. When you don't eat, you also lose some of the water and electrolytes that come with food.

To mitigate this risk, it is essential to consume sufficient fluids during both fasting and eating windows. This includes plain water, and for longer fasts, consider incorporating electrolyte-rich fluids like diluted bone broth or adding a pinch of high-quality salt (like Himalayan pink salt) to your water. Electrolyte supplements can also be considered under the guidance of a healthcare professional.

Who Should Avoid Intermittent Fasting for Fatty Liver?

While intermittent fasting can be a powerful tool for many, it is not suitable for everyone, especially individuals with fatty liver disease who may have underlying health complexities. Certain populations should exercise caution or avoid IF altogether to prevent potential adverse health outcomes. A thorough medical evaluation is essential to determine individual suitability.

Pregnant and breastfeeding women, for instance, have increased nutritional demands and hormonal changes that make IF inappropriate. Similarly, individuals with a history of eating disorders should steer clear of IF, as it can trigger or exacerbate disordered eating patterns. Those who are underweight or have significant nutritional deficiencies should prioritize restoring their nutritional status before considering any form of fasting.

• Pregnant or breastfeeding women

- Individuals with a history of eating disorders (anorexia, bulimia)
- Individuals who are underweight or have nutrient deficiencies
- People with type 1 diabetes (unless closely supervised by a medical professional)
- Individuals taking certain medications for diabetes or blood pressure (requires medical supervision)
- Children and adolescents
- Individuals with severe medical conditions or a history of hypoglycemia

Individuals with Type 1 Diabetes

Intermittent fasting is generally not recommended for individuals with type 1 diabetes due to the inherent risks of blood sugar dysregulation. Type 1 diabetes requires careful management of insulin therapy to prevent both hyperglycemia and dangerous hypoglycemia. Fasting can unpredictably alter blood glucose levels, making it challenging to balance insulin dosages.

The risk of diabetic ketoacidosis (DKA), a life-threatening condition, is also elevated during prolonged fasting in individuals with type 1 diabetes. If IF is to be considered at all, it must be under extremely close medical supervision with significant adjustments to insulin regimens and frequent blood glucose monitoring. For most, avoiding IF is the safest approach.

People with a History of Eating Disorders

Individuals with a personal history of eating disorders, such as anorexia nervosa or bulimia nervosa, should strictly avoid intermittent fasting. The restrictive nature of IF can easily trigger or exacerbate disordered eating patterns, leading to a relapse or the development of new unhealthy obsessions with food and eating. The focus for these individuals should be on developing a healthy, balanced relationship with food in a safe and supportive environment.

If you have a history of an eating disorder, it is crucial to consult with a therapist or registered dietitian specializing in eating disorders before considering any dietary pattern that involves restriction, including IF. Their guidance can help you navigate food choices in a way that promotes recovery and well-being.

Tips for Safely Implementing Intermittent Fasting for Fatty Liver

Embarking on intermittent fasting for fatty liver requires a thoughtful and strategic approach to maximize benefits while minimizing risks. Prioritizing safety and sustainability is key to achieving long-term improvements in liver health and overall well-being. It's not just about when you eat, but also about what you eat during your eating window.

The foundation of safe IF for fatty liver lies in a balanced and nutrient-dense diet. During your eating periods, focus on whole, unprocessed foods. This includes lean proteins, healthy fats, plenty of fruits and vegetables, and whole grains. These foods provide the essential nutrients your body needs and help you feel full and satisfied, reducing the likelihood of overeating or making poor food choices.

- Start slowly and gradually increase fasting duration.
- Prioritize nutrient-dense foods during eating windows.
- Stay well-hydrated throughout the day.
- Listen to your body and adjust as needed.
- Incorporate gentle exercise but avoid overexertion during fasting.
- Get adequate sleep.
- Be patient and consistent.

Gradual Introduction and Adjustment

It is highly recommended to start IF gradually, especially if you are new to it. Instead of jumping into a strict 16/8 schedule, begin with shorter fasting periods, such as 12 hours, and gradually extend them as your body adapts. This could mean starting with a 12-hour overnight fast and slowly working up to 14, then 16 hours.

Pay close attention to how your body responds. If you experience significant side effects like severe headaches, dizziness, or extreme fatigue, it might be a sign that you are pushing too hard or too fast. Don't hesitate to scale back to a more manageable fasting window and try again later. The goal is to create a sustainable habit, not a short-term struggle.

Focus on a Healthy Diet During Eating Windows

The quality of your diet during your eating windows is just as, if not more, important than the timing of your meals, especially when managing fatty liver. Consuming a diet rich in whole, unprocessed foods will provide the necessary nutrients to support liver function and overall health. Emphasize:

- Lean proteins (fish, poultry, beans, lentils)
- Healthy fats (avocado, nuts, seeds, olive oil)
- Plenty of colorful fruits and vegetables
- Whole grains (quinoa, oats, brown rice)

Avoid processed foods, sugary drinks, refined carbohydrates, and excessive saturated and trans fats, as these can negatively impact liver health and counteract the benefits of IF. A balanced diet ensures you are getting the vitamins, minerals, and antioxidants your liver needs to repair itself and function optimally.

When to Consult a Healthcare Professional

Before commencing any intermittent fasting regimen, especially for a medical condition like fatty liver, consulting with a healthcare professional is paramount. A doctor or a registered dietitian can provide personalized guidance based on your specific health status, medical history, and any medications you are currently taking. They can help you determine if IF is safe and appropriate for you and recommend the best protocol.

It is particularly important to seek medical advice if you have any underlying health conditions such as diabetes, heart disease, kidney problems, or if you are taking medications for blood pressure or blood sugar control. They can help you monitor your progress, adjust your treatment plan as needed, and identify any potential risks or contraindications. Regular follow-up appointments are advisable to ensure the safe and effective implementation of IF for fatty liver management.

FAQ

Q: How long does it typically take for intermittent

fasting to show effects on fatty liver?

A: The timeline for seeing effects from intermittent fasting on fatty liver can vary significantly from person to person. Factors such as the severity of the fatty liver, adherence to the fasting protocol, the quality of the diet during eating windows, and individual metabolic responses all play a role. Some individuals may notice improvements in liver enzymes or feel better within a few weeks, while significant reduction in liver fat can take several months to a year of consistent practice. It's essential to maintain patience and consistency.

Q: Can intermittent fasting reverse fatty liver completely?

A: While intermittent fasting can significantly reduce liver fat and improve the health of the liver, whether it can "completely reverse" fatty liver is a nuanced question. For many with simple fatty liver (steatosis), IF can lead to a substantial decrease or even elimination of liver fat, effectively reversing the condition. However, if the fatty liver has progressed to NASH with fibrosis, IF can help manage the condition, reduce inflammation, and slow or halt the progression, but complete reversal of established fibrosis might be more challenging and may require a combination of lifestyle interventions and medical management.

Q: What are the best foods to eat during the eating window when practicing intermittent fasting for fatty liver?

A: When practicing intermittent fasting for fatty liver, it's crucial to focus on a nutrient-dense, whole-foods diet during your eating window. Prioritize lean proteins such as fish, chicken, and plant-based sources like beans and lentils. Include plenty of fiber-rich foods like fruits, vegetables, and whole grains (quinoa, oats, brown rice). Healthy fats from sources like avocados, nuts, seeds, and olive oil are also beneficial. Limit processed foods, added sugars, refined carbohydrates, and unhealthy saturated and trans fats, as these can exacerbate fatty liver.

Q: Is it okay to drink coffee or tea during intermittent fasting periods?

A: Yes, plain coffee and unsweetened tea are generally considered acceptable during fasting periods for most intermittent fasting protocols. These beverages are typically calorie-free and do not break the fast. In fact, the caffeine in coffee and tea can sometimes help suppress appetite and boost metabolism, which may be beneficial for managing fatty liver. However, it's important to avoid adding sugar, milk, cream, or artificial sweeteners, as these can disrupt the fasting state and negate the benefits.

Q: What are the signs that intermittent fasting might not be working or is causing harm for fatty liver?

A: Signs that intermittent fasting might not be working or could be causing harm for fatty liver include a persistent worsening of liver enzymes (as indicated by blood tests), continued weight gain, increased fatigue, persistent digestive issues, or a significant increase in abdominal pain. If you experience any concerning symptoms or your fatty liver condition does not improve despite consistent adherence to IF and a healthy diet, it's crucial to consult with your healthcare provider. They can assess your situation and adjust your management plan accordingly.

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Disease Ju-Seop Kang, 2025-08-20 The prevalence of Non-alcoholic fatty liver disease (NAFLD) in individuals with T2DM can be as high as 70%, and these patients experience a twofold increased risk of all-cause mortality. In patients with severe obesity, the prevalence of NAFLD may rise to 90%. Consequently, the prevalence of NAFLD represents a significant global health burden that requires urgent clinical attention and management. NAFLD is explicitly defined by the presence of excessive hepatic fat accumulation in the absence of other causative factors, which include, but are not limited to, significant alcohol consumption, viral hepatitis, the use of steatogenic medications such as amiodarone or tamoxifen, and concurrent liver diseases. This book discusses several topics highly correlated with NAFLD, including nutrition, micronutrients, gut microbiota, diet, metabolic disease, pregnancy, and lifestyle factors, to enhance the general public's comprehensive understanding of

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etiologies; Impications of NASH as the etiology of end stage liver disease prior to and after liver transplantation; Why do lifestyle recommendations fail in most patients; Rational nutritional therapeutics for NAFLD; Recruitment and retention strategies in long-term trials for NASH; Managing extrahepatic comorbidities in NAFLD; The current status of noninvasive tools for the assessment of NAFLD; and Pharmacological Treatment strategies for NASH. Readers will come away with the information they need to improve outcomes in patients with fatty liver disease.

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and the specific symptoms each plant best addresses. Each chapter includes a materia medica section that describes individual herbs with tips on their properties, modes of action, and the specific symptoms each plant best addresses. These formularies are also a tutorial for budding herbalists on the sophisticated art of fine-tuning the precision of an herbal formula for the constitution and overall health condition of an individual patient, rather than a basic diagnosis. The text aims to teach via example, helping clinicians develop their own intuition and ability to create effective herbal formulas. Volume 2 (Circulation and Respiration) is also available, and Volume 3 (Endocrinology) will be published in May 2019. Volumes 4 (Neurology, Pyschiatry, and Pain Management) and 5 (Immunology, Orthopedics, and Otolarnygology) will be published in 2020.

intermittent fasting for fatty liver: The Role of Inflammation and Immune Control in Digestive Disease and Therapeutic Approaches Shuai Wang, Liu Changhui, Zhenhua Li, Wenyi Gu, 2025-05-29 Digestive system diseases, including gastroenteritis, irritable bowel syndrome, Crohn's disease, ulcerative colitis, hepatitis, and pancreatitis, present as a common disease that affects millions of people worldwide. The pathogenesis of these diseases remains as a complex context, involving multiple factors such as genetics, environment, lifestyle, microbiome, and immune system. Recently, multi-omics analysis strategies raised much concern about the proximal and distal cross-talks between immunocytes and tissue-specific cell types. Methods for the diagnosis, treatment, and prognosis of digestive diseases related to immunity, such as stem cell therapies, small-molecule chemical drugs, biologics, and phytochemicals, have been successively developed and applied. However, the specific functions and related mechanisms of immune cells, such as T cells, B cells, macrophages, and other immune cells in digestive diseases, still need further exploration. Thus, investigating the potential and promising immunomodulatory targets would help us uncover the initiation and development of molecular events of immune disorders in digestive system diseases, which in turn would promote their prevention and treatment. The goal of this Research Topic is to provide a forum to advance research on the comprehensive understanding of immune regulatory mechanisms and the role of abnormal mechanisms in the occurrence and development of digestive diseases, as well as to explore innovative immune-oriented drugs or treatment interventions in the attempt to achieve a beneficial impact on the diagnosis, prevention, therapy, and prognosis of digestive diseases. Bullet points are as below: 1) The specific functions and clinical significance of immune cells (e.g., T cells, B cells, macrophages, and other immune cells, etc.) in digestive diseases 2) The mechanism of immune cells participate in inflammatory reactions and tissue damage in digestive diseases 3) The mechanism of regulators affecting the inflammatory response of the digestive system (e.g., nuclear receptor/membrane receptor pathway, etc.) 4) The role of small molecules in digestive diseases (e.g., cytokines, chemical factors, anti-inflammatory agents, immune regulatory molecules, etc.) 5) Development of novel anti-inflammatory and immunomodulatory drugs for digestive diseases Bibliometric studies are outside of the scope of this section and may be rejected or redirected to other journals/sections as appropriate. Bioinformatics or Computational Analysis of public genome or transcriptome databases need to be accompanied by robust and relevant validation to be submitted to this section. Manuscripts describing the pharmacological action of drugs used in traditional medicine in models of disease, such as inflammatory disease, are not in scope unless they have a strong focus on the immune system.

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