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Research on multi-omics and environmental risk factors for inflammatory bowel disease in south-central China

Submission date	Recruitment status	[ ] Prospectively registered
07/09/2021	No longer recruiting	[ ] Protocol
Registration date	**Overall study status**	[ ] Statistical analysis plan
15/09/2021	Ongoing	[ ] Results
Last Edited	**Condition category**	[ ] Individual participant data
24/09/2021	Digestive System	[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Inflammatory bowel disease (IBD) includes Crohn's disease (CD) and ulcerative colitis (UC), a group of long-term conditions that involve inflammation of the gut. Due to the high burden of illness and progressive disability associated with IBD and the increasingly high cost of its management, effective prevention strategies for the occurrence and progression of IBD are needed.
Genetic and environmental factors contribute to the development of IBD and the mechanism is complex and still unclear. Also, intestinal bacteria, fungi, viruses, and other microorganisms (microbiome) have a crucial role. Therefore, genetic susceptibility, environmental risk factors, the microbiome, and their interplay in IBD still need more exploration.
This study will include adults and children in south-central China, and aims to establish an IBD population cohort, database, and biological specimen bank in Hunan province, China to explore the impact of different treatments on the prognosis and long-term prognosis of IBD patients and to identify environmental predisposition factors for IBD. This study also aims to discover subtypes of IBD and the markers of each subtype and find new targets to provide new prevention and treatment methods for IBD.

Who can participate?
1. Patients of all ages with IBD (including Crohn’s disease and ulcerative colitis) or suspected IBD
2. Healthy participants of all ages without gastrointestinal diseases and symptoms

What does the study involve?
Data and samples will be collected by participating centers at the start of the study and during the follow-up period (3 years). Optional consent will be sought from patients to collect all information and samples.

What are the possible benefits and risks of participating?
Participants will be informed that they are unlikely to benefit directly. The study won't involve any extra visits or procedures outside of the standard of care treatment other than optional sample collection. This will involve minor discomfort associated with blood sampling.

Where is the study run from?
The Third Xiangya Hospital and Hunan Children's Hospital (China)

When is the study starting and how long is it expected to run for?
January 2021 to December 2026

Who is funding the study?
1. National Natural Science Foundation of China (China)
2. Key Project of Research and Development Plan of Hunan Province (China)

Who is the main contact?
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Contact information

Type(s)
Scientific

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Additional identifiers

Study information

Scientific Title
Research on the occurrence and development of inflammatory bowel disease based on multi-omics and environmental risk factor analysis: a longitudinal cohort study of adults and children with inflammatory bowel disease in south-central China

Acronym
XY-IBD

Study objectives
The hypothesis of the cross-sectional study is that using multi-omics data to discover the molecular subtypes of inflammatory bowel disease (IBD) and the molecular markers of each

subtype will find new targets for the prevention and treatment of IBD and the comorbidities of IBD.

The aim of the longitudinal study is to explore the impact of different treatments on the prognosis and long-term prognosis of IBD patients; and the impact of heavy metals, microcystins, diet, sleep and mental state on the prognosis and long-term prognosis of IBD patients.

Ethics approval required
Old ethics approval format

Ethics approval(s)
1. Approval pending, Ethics Committee of The Third Xiangya Hospital of Central South University (+86 (0)731-88618938; xy3irb@163.com, xy3irbreview@163.com)
2. Approval pending, Ethics Committee of Hunan Children's Hospital (+86 (0)731-85356014; 1341029443@qq.com)

Study design
Prospective cohort study and case-control study

Primary study design
Observational

Study type(s)
Diagnostic

Health condition(s) or problem(s) studied
Inflammatory bowel disease (IBD), including Crohn's disease (CD), ulcerative colitis (UC)

Interventions
Baseline measurement (Spring 2021):
For adult patients, when they are hospitalized in The Third Xiangya Hospital, they will be asked if they are willing to take part in the program and sign the letter of contentment. Those who agree to be participants will give researchers their biological samples including blood, fecal, urine, and saliva. Those participants will also fill a questionnaire related to diet, life habits, and other environmental factors.
For pediatric patients, when they are hospitalized in the Hunan Children's Hospital, their guardians will be asked if they are willing to be participants. Samples are the same with adult patients. Questionnaires will be filled by both the children and their guardians.
For healthy controls, they are recruited to go to the hospital healthy center to fill the questionnaire and provide their biological samples. Those samples will be analyzed for whole gene sequencing, metagenome, metabolomics, metaproteomics, other environmental risks like algal toxins, and the number of heavy metals.

First follow up (Summer 2021):
Six months after the baseline measurements, blood samples are collected for laboratory tests including haemoglobin, platelets, albumin, calprotectin and CRP, and participants undergo an endoscopic examination with biopsies and scoring (Ulcerative Colitis Endoscopic Index of Severity (UCEIS) for UC, Crohn's Disease Endoscopic Index of Severity (CDEIS) for CD). Each patient should be scored for disease activity (Modified Mayo score for UC, Crohn's Disease Activity Index (CDAI) for CD). Patients who accept anti-TNFα therapy are evaluated for curative

effect and antiantibody testing. The same version of the questionnaire provided at baseline will be used as well.

Patients will be followed up every 6 months. Register data will be collected and analysis will be carried out by the study statistician. The total duration of this study is 3 years.

Intervention Type
Other

Primary outcome(s)
1. Multi-omics integrated analyses including blood metabolomics, fecal metabolomics, metagenomics, and metaproteomics, measured using the Illumina sequencing platform and liquid chromatograph-mass spectrometer (LC-MS) at baseline
2. Degree of disease activity measured by CDAI and Mayo score at baseline and follow-up (every 6 months for 3 years)
3. Degree of disease in endoscopy measured by UCEIS and CDEIS at baseline and follow-up (every 6 months for 3 years)
4. Degree of inflammation in vivo measured using hemoglobin, platelets, albumin, calprotectin and CRP tests at baseline and follow-up (every 6 months for 3 years)
5. Resistance to anti-TNFα measured by the concentration of antiantibody at follow-up (every 6 months for 3 years)

Key secondary outcome(s))
1. Genetic characteristics measured using whole gene sequencing at baseline
2. Environment factors measured using Algal toxins and heavy metals at baseline
3. Living habits and psychological factors measured using the Pittsburgh Sleep Quality Index (PSQI), Patient Health Questionnaire (PHQ-9), Generalized Anxiety Disorder- 7 (GAD-7), and the Inflammatory Bowel Disease Questionnaire (IBDQ) at baseline and follow-up (every 6 months for 3 years)

Completion date
01/12/2026

Eligibility

Key inclusion criteria
Patients:
1. Patients with inflammatory bowel disease (including Crohn’s disease and ulcerative colitis) or suspected IBD patients in The Third Xiangya Hospital and Hunan Children's Hospital
2. Be willing to take part in this program and provide written informed consent (if children, the consents are signed by the guardians)
3. All ages

Controls:
1. Healthy participants from the Health Management Center of The Third Xiangya Hospital and Hunan Children's Hospital
2. All ages

Participant type(s)
Mixed

Healthy volunteers allowed
No

Age group
All

Sex
All

Key exclusion criteria
1. Patients who are unable to cooperate with work due to mental or physical reasons
2. Healthy controls who have gastrointestinal diseases and symptoms

Date of first enrolment
01/09/2021

Date of final enrolment
01/12/2023

Locations

Countries of recruitment
China

Study participating centre
The Third Xiangya Hospital, Central South University
138 Tongzipo Road
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Changsha
China
410013

Study participating centre
Hunan Children's Hospital
86 Ziyuan Road
Changsha
China
410007

Sponsor information

Organisation
Third Xiangya Hospital

ROR
https://ror.org/05akvb491

Funder(s)

Funder type
Research organisation

Funder Name
National Natural Science Foundation of China (81970494)

Alternative Name(s)
Chinese National Science Foundation, Natural Science Foundation of China, National Science Foundation of China, NNSF of China, NSF of China, National Nature Science Foundation of China, Guójiā Zìrán Kēxué Jījīn Wěiyuánhuì, , NSFC, NNSF, NNSFC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
China

Funder Name
Key Project of Research and Development Plan of Hunan Province (2019SK2041)

Alternative Name(s)

Funding Body Type
Government organisation

Funding Body Subtype
Local government

Location
China

Results and Publications

Individual participant data (IPD) sharing plan

The data-sharing plans for the current study are unknown and will be made available at a later date.

IPD sharing plan summary

Data sharing statement to be made available at a later date