



Call for an online Summer Internship Program naming “AIDOTHON-2022” for undergraduate Engineering and Medical Sciences students in their 3rd/4th/5th year to work as part of an interdisciplinary team to develop digital technologies for finding innovative solutions and address various facets of chronic diseases like Rheumatoid Arthritis and Inflammatory Bowel Disease

Apply for AIDOTHON-2022 using this google form
<https://forms.gle/MVLdGn6UTEUX8rLe9>

Context:

IIT Ropar in collaboration with Gita & Susil Kumar Das (GnSkD*) Foundation through its social venture aidKRIYA** (<https://aidkriya.com/>) is floating an online summer internship program naming “AIDOTHON-2022” for S.T.E.M and Medical Sciences students starting from May 23rd to July 31st, 2022. The first week of the internship will be a preselection week where based on student performance, twelve students will be selected for an extensive 8-week internship program. The focus of AIDOTHON is to do crowd research through selected interns for developing digital technologies to innovate solutions and address various facets of Rheumatoid Arthritis (RA) and Inflammatory Bowel Disease (IBD) ecosystem.

The following is the **indicative list** of the potential ideas that could be worked on by interns as part of the interdisciplinary team:

1. Use of digital tools, such as *web/mobile apps, chatbots, visualization dashboards, open-source algorithms, etc.*, to sense/recognize and analyze early symptoms of RA and IBD and provide the necessary advice.
2. Use of digital tools for data mining of medications used in the Indian population on RA and IBD patients.
3. Use of digital tools for discovering possible nutritional interventions and/or tracking lifestyle (re)forming practices to alleviate symptoms of RA and IBD patients
4. Use of digital tools to create advisory platforms by healthcare professionals for caregivers for RA and IBD.

*GnSkD Foundation is a Not for Profit Company registered with the Ministry of Corporate Affairs, Govt.

**aidKRIYA (www.aidkriya.com) - a social venture of GnSkD Foundation was born out of the pressing need to bring together the data and knowledge in the area of Rheumatoid Arthritis (RA) and Inflammatory Bowel Disease (IBD) ecosystem and seek solutions to fill the gaps using modern technology tools to develop and deliver possible interventions to alleviate the pain and suffering for the RA and IBD Warriors.

5. Development of eXplainable Artificial Intelligence (XAI) solutions to analyze/recommend alternate medications and/or self-guidance for RA and IBD.
6. Design and development of digital twin of medical devices (including their system-level design) for early detection or alleviating the pain associated with RA and IBD.

Eligibility:

Exceptionally talented students at the level of 3rd/4th/5th year UG (Engineering or Medicine) from any engineering or medical institute/university/college with specialization in (but not limited to) Aerospace, Computer Science & Engineering, Chemical, Mechanical, Production, Metallurgy, Materials, Civil, Biotech and BioMed, Medical Sciences and Pharmaceutical Sciences.

Desired Outlook & Expertise:

Aspire to use digital technologies to innovate solutions and address various facets of the RA and IBD ecosystem through technology adoption in healthcare, therapeutics, biotech interventions, data analytics, biomedical product design & development.

Shortlisting Criteria for Internship:

- Curriculum Vitae of student
- Portfolio of Projects Executed: A document providing a summary of projects executed by you as a team leader or member highlighting your passion for technology and innovation.
- A 3-minute video story about your vision for executing the project and the relevant experience.
- On the basis of the recommendation letter provided by your reference given in the application form. Note: letter of recommendation will only be collected for 50 provisionally selected participants by the Organizers after the first shortlisting.
- A letter from the student institute/college mentioning the availability of students to do an online internship from 23rd May till July 31st, 2022.
- Call for Applications: 30th April 2022
- Last date of receiving applications: 10th May 2022 / 11:59 pm (Indian Standard Time)
- Expected results announcement: 20th May 2022
- Preselection performance week: 23rd May to 31st May 2022
- Internship duration: 1st June till 31st July 2022
- Number of internships available: 12
- Number of Projects: Two (Project details will be shared at the end of training week with the selected interns. One project will be related to Rheumatoid Arthritis (RA) disease and the other will be related to Inflammatory Bowel Disease (IBD))
- Number of Teams: 4 (Two teams to work on the same project independently)
- Number of members in each team: 3
- Stipend: Rs. 5,000/- per intern for the entire duration of the internship.
- Mode of internship: Online

Team size:

An interdisciplinary team of 3 members will be constituted by IIT Ropar from the applications shortlisted against the call to work on either one of the projects. The interdisciplinary team shall have members of

Award for Winning Team:

There will be 2 winning teams out of 4 participating teams. One team will be selected from the two teams working on the same project based on the comprehensive solution offered by the team.

Timeline of internship:

Weeks	Outline of the activities
0 (pre-selection week)	Online seminar series by medical experts in the field of auto-immune diseases like Rheumatoid Arthritis and Inflammatory Bowel Disease. Training by volunteers from Industry/Academia on topics related to the projects which include biotech advances, Design thinking, Advance CAE practices, Advance topics in Systems-level modeling, Life Cycle Analysis, Project Management, Patent Search, Manufacturing simulations, Techno-economic analysis, etc. <i>Assignment submission-based evaluation of participating students for final shortlisting for the 8 weeks internship.</i>
1	Detailed problem statement to be provided by the IIT Ropar, Brainstorming Sessions, Patent search and Literature review, etc
2-8	Synthesis of the problem, analysis, optimization, evaluation, preparation for the patent document, report generation, and finally the project presentation

Mentoring of Interns:

Mentoring of interns will be done by volunteers from industry/academia and medical professionals for regular intellectual support and guidance for each team.

Evaluation

- At the end of the internship, all teams will be asked to make a presentation on their work along with the submission of the detailed project report and regular progress log files by individual members.
- The evaluation will be based on the submitted report/regular progress log file by individual members and presentation in front of biomedical experts from Industry/Academia as well as other team members and all the applicants for the internship who couldn't get selected. The final presentations may be aired on public platforms.
- One team for every project will be announced the winner of the competition on the basis of their comprehensive performance.

Relevant Information^{1,2}:

What is rheumatoid arthritis (RA)?

Rheumatoid arthritis, or RA, is an autoimmune and inflammatory disease, which means that your immune system attacks healthy cells in your body by mistake, causing inflammation (painful swelling) in the affected parts of the body.

RA mainly attacks the joints, usually many joints at once. RA commonly affects joints in the hands, wrists, and knees. In a joint with RA, the lining of the joint becomes inflamed, causing

damage to joint tissue. This tissue damage can cause long-lasting or chronic pain, unsteadiness (lack of balance), and deformity (misshapeness).

RA can also affect other tissues throughout the body and cause problems in organs such as the lungs, heart, and eyes. Early diagnosis and therapy can usually prevent permanent disability. Unfortunately, this does not happen in many cases. In India, approximately one percent of the population suffers from rheumatoid arthritis.

What is inflammatory bowel disease (IBD)?

Inflammatory bowel disease (IBD) is a term for two conditions (Crohn's disease and ulcerative colitis) that are characterized by chronic inflammation of the gastrointestinal (GI) tract. Prolonged inflammation results in damage to the GI tract. Some of the differences between Crohn's disease and ulcerative colitis:

- Crohn's disease can affect any part of the GI tract (from the mouth to the anus)—Most often it affects the portion of the small intestine before the large intestine/colon.
- Ulcerative colitis occurs in the large intestine (colon) and the rectum

IBD in recent times is causing a significant healthcare burden as both ulcerative colitis and Crohn's disease require lifelong therapy and constant monitoring.

References:

1. <https://www.cdc.gov/chronicdisease/index.htm>
2. Jain, Mayank; Venkataraman, Jayanthi Inflammatory bowel disease, Indian Journal of Medical Research: April 2021 - Volume 153 - Issue 4 - p 421-430
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