

Project No. 101057491

Oral delivery of encapsulated RNA nanotherapeutics for targeted treatment of ileal Crohn's disease

Deliverable 6.1 GENEGUT website

WP 6 – communication, dissemination and exploitation

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Contents

RE	VISION HIS	TORY	2
PΑ	RTNER SHO	ORT NAMES	4
ΑВ	BREVIATIO	NS	4
EXI	ECUTIVE SU	JMMARY	5
	Background	I	5
(Objectives.		5
ſ	Methodolo	gy and implementation	5
I	mpact		5
1	Next steps.		5
1	KEY FACT	rs	6
2	ROLES A	ND RESPONSIBILITIES	6
3	STRATEG	Y	6
4	WEBSITE	IMPLEMENTATION	7
4	1.1 Wor	dPress and Elementor	7
	4.1.1	Colour guide and theme	7
	4.1.2	Images and graphics	8
	4.1.3	Responsiveness	8
4	1.2 Web	osite structure	9
	4.2.1	Landing page	9
	4.2.2	About	9
	4.2.3	Crohn's Disease	10
	4.2.4	RNA therapy	10
	4.2.5	Partners	10
	4.2.6	News & Events	10
	4.2.7	Media	10
5	OUTREAC	CH AND EVALUATION	11
6	OUTLOO	к	11
7	INADDECC	IONS FROM THE CENECUT WERSITE	12

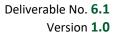


Partner short names

UCC	University College Cork	
i3S	Institute of Research and Innovation in Health	
UU	Uppsala University	
CarboHyde	CarboHyde ZRT	
Janssen	Janssen Pharmaceutica NV	
Lonza	Capsugel France SAS	
EFCCA	European Federation of Crohn's and Ulcerative Colitis Associations	
accelCH	accelopment Schweiz AG	
BU	Bangor University	

Abbreviations

CD	Crohn's Disease
D	Deliverable
EC	European Commission
EU	European Union
FAQ	Frequently asked questions
HEU	Horizon Europe
IBD	Inflammatory Bowel Disease
M	Month
MS	Milestone
RNA	Ribonucleic acid
WP	Work package





Executive summary

Background

The deliverable **D6.1 GENEGUT website**, is part of WP6 - **communication**, **dissemination and exploitation**, and presents the GENEGUT project website, describing the main structure of the website, how it is set up and how it will be maintained throughout the project's duration and for four years after the project end. The project website serves as a powerful tool **to communicate**, **inform and raise awareness** on the endeavours and progress of the project, enabling the GENEGUT consortium to easily reach out to all its stakeholders. Tailored to the GENEGUT stakeholders, the website provides up-to-date, consistent and comprehensive information on the project.

Objectives

The main objective of the website is to raise awareness for the project among society, patients and informing healthcare providers and regulatory bodies on how the GENEGUT solution aims, in the long-term, to help people living with ileal Crohn's Disease. In addition, the website aims to present the consortium, establishing a network of experts and demonstrating their collaboration throughout the scientific and non-scientific work packages. The website serves as a user-friendly, accessible and comprehensive online platform to inform on the most current project developments, key results and outcomes as well as achievements of the project and its individual participants.

Methodology and implementation

The GENEGUT website www.genegut.eu was created and launched in July 2022, before the project start. To ensure not only easy maintenance but also an appealing appearance, the website was created using WordPress. The projects' channels on Twitter and LinkedIn, as well as the projects partners' established social media channels will facilitate further outreach and sharing of information to existing audiences.

Impact

The expected impact resulting from the GENEGUT website is **increased visibility of the GENEGUT project, stakeholder activation, further reach and uptake of results and increased awareness about Crohn's Disease.** The ultimate aim is that all main stakeholders in the areas of science, industry, healthcare and society will be aware of this EU funded project, of its results and of the importance of delivering safe and effective therapies for patients with ileal Crohn's Disease.

Next steps

The next steps in the development of the GENEGUT website will involve keeping its content updated with news and results from the partners. As the project progresses, dedicated pages will be added to showcase the latest results, address frequently asked questions, further share communication activities implemented by the partners and accommodate any new items that will be of relevance to share with the project's stakeholders (see section 6).

1 Key facts

- The **GENEGUT website** is available at www.genegut.eu.
- It was first launched in July 2022 before the project start.
- accelCH created and maintains the website with WordPress.
- The project website is securely hosted on accelCH's webserver.

2 Roles and responsibilities

The GENEGUT website is a joint effort of all partners, who will provide content for relevant updates as well as contribute their input and feedback throughout the duration of the project. EFCCA as deputy lead of WP6 will be a key contributor to reflect the project's patient-centered approach on the website. Nonetheless, accelCH, as the partner leading the project's communication, dissemination and exploitation activities as part of WP6 is responsible for the planning and implementation of the technical and design aspects.

Structure	The structure of the website was first drafted between accelCH and UCC, and then confirmed by all partners.
Design	Different design concepts were presented by accelCH to UCC. The design assessed as the most suitable to the target audiences was then implemented by accelCH.
Content	Content is contributed by all partners, in particular by EFCCA, under guidance by accelCH.
Technical maintenance	accelCH is responsible for the technical implementation and maintenance of www.genegut.eu

3 Strategy

The strategy for the GENEGUT website follows three pillars. 1) attract visitors and stakeholders, 2) provide relevant and up-to date information tailored to the GENEGUT target audiences, while 3) creating and maintaining a user-friendly and easily accessible platform to follow these objectives. Supported by the GENEGUT social media channels on Twitter and LinkedIn, we enable long- as well as shortformat content to cohesively communicate and inform about the project.



Figure 1 - GENEGUT website and Twitter channel.

Attract visitors – to attract visitors, the different pages on the website make use of GENEGUT's defined colour palette (see section 4.1.1), engaging images and graphics (see section 4.1.2),



dynamic features like live Twitter feeds, and a user-friendly design enabling visitors and stakeholders to easily navigate the GENEGUT website.

- Provide information the main aim of the GENEGUT website is to provide relevant, accessible and up-to-date information about the project. The use of different forms of text layout, buttons, and info-boxes allows visitors to easily gain all relevant information both at surface-level and in detail.
- Implementing a user-friendly platform the GENEGUT website is designed to be intuitive and user friendly. Visual elements, widgets and page-anchors allow visitors to jump directly to their desired destination, containing the specific information they are looking for.

4 Website implementation

This chapter presents the technical implementation of the GENEGUT website using WordPress and Elementor, the website theme, as well as its separate webpages.

4.1 WordPress and Elementor

https://genegut.eu/ was created and is maintained by accelCH, hosted securely on their webserver. The website was set up with the content management system (CMS) WordPress and the plugin "Elementor", which is the leading website-building platform for WordPress. The tool includes an intuitive visual builder which enables building professional, pixel-perfect websites. Furthermore, it offers flexible and professional layouts, and various additional plugins to integrate interactive features to adjust the website to the project's needs. By default, it also offers responsive designs, i.e., website layouts that adapt to different screen sizes. The website is based on the scroll-down movement to simplify navigation through the broad content that will be made available in the future. Posts are displayed in reverse chronological order so that the most recent news entry is shown at the top of the page. As the number of posts grows, specific tags, such as the month of publication or the topic, will be added to each post so that the users can filter them according to their needs and interest.

4.1.1 Colour guide and theme



Figure 2 - The GENEGUT colours.

The website theme has been customised and adjusted by accelCH, following **GENEGUT's visual identity**, to create a recognisable design for the project across its communication channels. The project's visual identity was defined, including the fonts Roboto and Calibri in different sizes for titles and body text to enhance the lecture flow. Links are displayed in the GENEGUT colours (Fig. 2). The theme used on the GENEGUT website is the Elementor "hello" theme, enabling easy maintenance and quick changes.



4.1.2 Images and graphics

The GENEGUT website makes use of a variety of different images and graphics to illustrate and support the content shared (Figure 3). Images and graphics on the one hand include team (member) photos, as well as photos taken at events, meetings and conferences. On the other hand, we make use of stock images to illustrate, for example, symptoms of Crohn's Disease (see section 4.2.3), or RNA. Lastly, we create graphic visuals including infographics used for both the website as well as social media campaigns, following a consistent style that can be easily associated to GENEGUT.



Figure 3 - Examples of the style used for diverse GENEGUT images and graphics.

4.1.3 Responsiveness

The GENEGUT website has been set up implementing a responsive website design. This ensures that the website is accessible and easy to read from all devices, including desktop as well as mobile devices such as smartphones and tablets. accelCH performs a regular quality check as new elements are implemented on the website to ensure functioning responsiveness. accelCH will take efforts to make the website fully accessible by, e.g., including alt-text for images.



 ${\it Figure~4-The~GENEGUT~website~makes~use~of~responsive~web~design.}$



4.2 Website structure

The website follows an intuitive and cohesive structure, with currently six thematic pages as well as the landing page implemented. A consistent layout is maintained throughout all pages, including a main header image and page/content title at the top, followed by text and visuals organised in boxes. Additionally, the GENEGUT website has a static header and footer implemented consistently throughout all the pages. Besides the navigation menu, the header includes links to the GENEGUT social media channels on Twitter and LinkedIn and contact form. The footer includes the respective funding and co-funding acknowledgements as defined in the GENEGUT grant agreement and in line with the national funding requirements of its UK and Swiss partners. The website structure will be adapted as the project progresses and results become available, e.g., by adding different sub-pages for different results, or a separate events page as more events are organised. As defined in the project DoA, an FAQ page will be implemented as well.

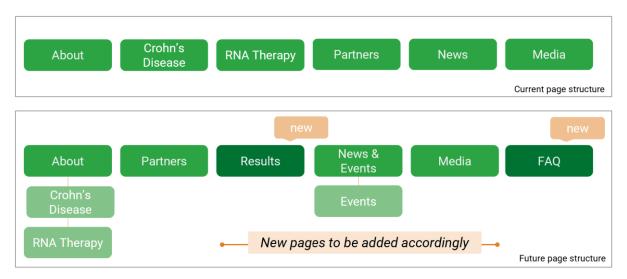


Figure 5 – The current and future website structure.

4.2.1 Landing page

The landing page is the first page visitors see when accessing www.genegut.eu through their web browsers (e.g., Google Chrome) or search engines (e.g., Google). The main purpose of the landing page is to attract visitors (including potential stakeholders and applicants for open positions within the project), provide information about the project in a concise manner, and enable visitors to access the different (sub)-pages easily. It also includes an embedded Twitter feed, displaying the most recent updates on the GENEGUT twitter channel.

4.2.2 About

The "About" page aims to provide detailed but still laymen-accessible information on the objectives, aims and approach of GENEGUT. Divided into two sections, the page provides an overview of the project's work plan, before explaining the GENEGUT approach in a more detailed manner, with specific information on, for example, the various types of molecular pathways and nanocarriers relevant for the efficacy of the new RNA therapy developed under GENEGUT. On the bottom of each of the two sections, the visitor is encouraged to jump to the next page by following a button with the texts "Read more on our Partners", linking to the Partners page and "Read more on RNA Therapy", which leads to the respective page on RNA therapy.



4.2.3 Crohn's Disease

The "Crohn's Disease" page is **dedicated to providing an overview of Crohn's Disease and IBD** in general. It is divided into three thematic sections following a question-and-answer format. As GENEGUT follows a patient-centred approach, the first section, titled "What are the symptoms?", focuses on the various symptoms experienced by people affected by CD, providing further key information on Crohn's Disease and IBD. The second section is titled "What is CD?" and provides information on the disease itself and how it manifests in the gastrointestinal tract. The last section is titled "Why the need for new therapies?" and explains the need for the GENEGUT project, exploring new, safe and effective means of treatment. This page is linked to the RNA Therapy page, allowing the visitor to receive more detailed information on the GENEGUT technology.

4.2.4 RNA therapy

The "RNA therapy" page explores three aspects of RNA therapy. Firstly, why RNA therapy is a promising technology to explore for treating ileal Crohn's Disease, secondly, a brief description of RNA and its biological components, and lastly, a brief overview of the history of RNA drugs, accompanied by a graphic displaying the timeline of the development of RNA-based drugs and their use cases. This page offers the visitor a condensed but cohesive overview of RNA, and its application in medical drug development, crucial for the GENEGUT project. As the project progresses, this page will be updated with infographics depicting RNA therapy and its functionality, as well as how it will be used in the GENEGUT project.

4.2.5 Partners

The "Partners" page gives a comprehensive overview of the GENEGUT Beneficiaries and Associated Partners and their respective team members. The project coordinator, Prof. Caitriona O'Driscoll (UCC), is represented at the top of the page with a testimonial photo and quote, opening a paragraph about the interdisciplinary GENEGUT consortium and the special collaboration within it. This section is followed by an embedded interactive map using the online tool "MapHub", visualising the locations of the nine GENEGUT project partners. When clicking on a project partner, the respective organisations website opens in a separate tab. On the bottom half of the page, each partner organisation is listed with information related to their expertise and their contribution in GENEGUT and involvement in their respective work packages. Each section includes photos and names of the team members involved in the project. The partner page is continuously updated as team members join or leave the consortium.

4.2.6 News & Events

The "News" page is the main resource for updates on the project progress, consortium insights as well as open positions advertised for the GENEGUT project. The page contains a sorted list of news items in reverse chronological order, an event calendar and the embedded Twitter feed. It is continuously updated and maintained to ensure a constant and up-to-date representation of the project status, highlights and events.

4.2.7 Media

The "Media" page currently functions as a resource for all media and press coverage on GENEGUT. With the respective press and media articles linked and listed chronologically. Secondly, the page also includes a download link to the GENEGUT press release. As more press coverage, press releases or other media produced within the project become available, the media page will be adapted accordingly.



5 Outreach and evaluation

The website's impact will be monitored and assessed by accelCH using Google Analytics, which offers the possibility to track website traffic (e.g., page views, unique visitors, duration of stay, content downloads), and detect immediate impact of dissemination activities that lead to more page views, for example when a partner presents its results at a conference, we expect to see an increase of new visitors. The outreach will then be evaluated to see if targets have been reached and, if necessary, to identify new outreach measures. Key Performance Indicators (KPIs), targets and detailed means of monitoring will be defined in *D6.2 Dissemination and exploitation plan including communication activities* as part of the project's comprehensive strategy.

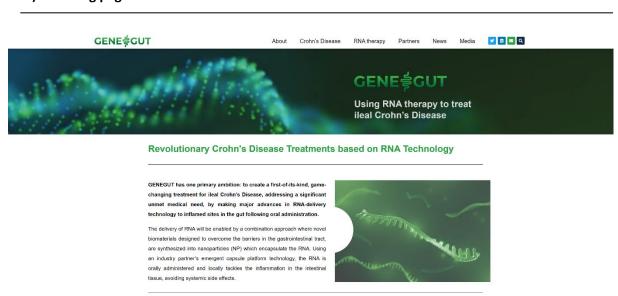
6 Outlook

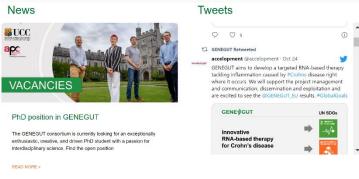
As the project progresses, the structure of the GENEGUT website will be adapted and dedicated pages will be added to showcase the latest results, address frequently asked questions, further share communication activities implemented by the partners and accommodate any new items that will be of relevance to share with the project's stakeholders. As the first project results become available (e.g. in the form of publications or conference presentations), we will share these via the GENEGUT social media channels, and implement a "Results" page on https://genegut.eu/, where all project results documented in the form of journal articles, posters, conference presentations, educational material or similar will be linked to their respective source websites. Furthermore, accelCH will implement alt-text on images and pay attention to colour contrast and wording to improve the website in regard to accessibility. Lastly, we will plan regular website and social media campaigns explaining the science, work and impact of GENEGUT, to ensure that the project website is used as effectively as possible to increase the project's impact. The upcoming deliverable of WP6, D6.2, will present a thorough plan and roadmap for all upcoming GENEGUT communication, dissemination and exploitation activities.



7 Impressions from the GENEGUT website

1) Landing page







2) About

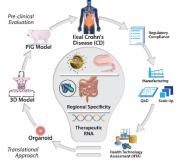


About

Crohn's disease (CD) is a non-communicable, global disease with an accelerating incidence (up to 23 per 100,000 persons/year) and annual health costs in excess of 5 billion euro in Europe. Despite advances in new immune modulators and biological treatment, up to 30% of patients become non-responders, highlighting the pressing need for novel, advanced therapies.

Title

GENEGUT will transform the treatment of ileal CD by developing a first-in-class oral RNA-based therapy, tackling inflammation locally in the intestinal tissue, while avoiding systemic side effects. The success of COVID-19 mRNA vaccines exemplified the potential of RNA-based therapies, Now. the challenge is to extend this revolutionary therapeutic modality to non-communicable diseases where RNA delivery has not been achieved, such as ileal CD.



Overview of the GENEGUT approach and its advanced therapy

Delivery of RNA will be enabled by a combination approach where novel biomaterials will complex the RNA within nanoparticles (NPs) designed to overcome the barriers in the gastrointestinal tract. Our industry partner's (Lonza) novel capsule technology will ensure site-specific release of the encapsulated NPs at the diseased ileum. The RNA-nanotherapeutics (siRNA and mRNA) will modulate gene expression locally in the ileum by targeting the clinically validated (JAK/STAT) pathway and two exploratory targets. Proof-of-efficacy will be demonstrated in vivo and also in a 3D organoid and multi-cellular model of ileal CD using primary human cells. GENEGUT brings together 9 partners from 8 European countries covering the lifecycle from bench to bedside, creating a network of renowned researchers, expert clinical scientists, SMEs and larger pharma companies and a patient organisation (EFCCA). GENEGUT will result in an oral RNA therapeutic ready for early clinical trial including coherent plans for clinical trials and regulatory submission thus enabling rapid availability for patients

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Read more on our partners

GENEGUT's approach

Three molecular pathways for the RNA-based gene modulation have been identified including JAK/STAT and two exploratory pathways including a peptide hormone regulating inflammation and barrier function and a glycoprotein regulating cellular proliferation and fibrosis Libraries of novel biocompatible materials, will be synthesised to formulate NPs that encapsulate relevant RNA cargos. Targeted oral delivery of RNA therapies to the ileal region will be achieved by encapsulating NPs within our industry partner's (Lonza) emergent capsule platform technology. Pivotal proof-of-efficacy will be demonstrated in an in vivo pig model of chronic intestinal inflammation and also a 3D organoid and multi-cellular model of ileal CD using primary human cells. The novel experimental data generated will then be integrated into a suite of tools to promote faster access for patients to this breakthrough therapy, including pharmacokinetic models to predict localised tissue concentration in diseased patients and a Health Technology Assessment to guide pharmacoeconomic outcomes. The robust data provided from the efficacy trials in pre-clinical and disease-relevant cell models will inform the design of subsequent clinical trials and related protocols.

Read more on RNA therapy

3) Crohn's Disease



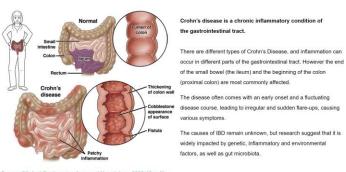
Crohn's Disease

Crohn's disease (CD) is a chronic, lifelong condition that causes inflammation of the lining of the gastrointestinal tract (GIT). It is one of the two major disorders under the umbrella term IBO (Inflammatory Bowel Disease). CD has become a global disease with an accelerating incidence (0.4-23 per 100.000 person/year). Crohn's disease is often painful and debilitating, and has a strong impact on the quality of life of people affected, their families and caregivers.

What are the symptoms?



What is CD?



Source: Clinical Gastroenterology and Hepatology 2020;18:xviii.

Why the need for new therapies?

Despite advances in new immune modulators and biological treatment, up to 30% of patients become non-responders, highlighting the pressing need for novel, advanced therapies. Intestinal fibrosis is a major challenge in CD, especially in patients with iteal disease, with the limited efficacy of current drugs. While in spite of all the advances in diagnosis, there has been no significant decrease in mortality in patients with CD over the last several decades. New therapies are urgently required as an alternative to surgical interventions, and to avoid the associated complications of iteal resection.

Read more on RNA therapy



4) RNA Therapy

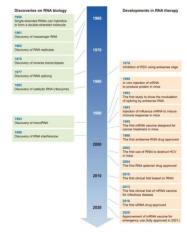


RNA therapy

GENEGUT: RNA therapy for ileal Crohn's Disease

Given the clinical success of mRNA-based vaccines for COVID-19, now is the right time to further push beyond the state of the art in RNA-based therapies and focus on the urgent and unmet need for advanced therapies targeting non-communicable diseases affecting tissues other than the liverblood. CD, as a highly prevalent disease with an unmet need for targeted treatment, is an ideal candidate for which to develop a safe, effective, targeted treatment exploring non-invasive routes of administration, such as oral delivery.

Ribonucleic acid (RNA) is a nucleic acid present in all living cells and has a vital biological role in regulation of gene expression and protein synthesis. Unlike DNA, however, RNA is most often single-stranded. An RNA molecule has a backbone made of alternating phosphate groups and the sugar ribose, rather than the deoxyribose found in DNA. Attached to each sugar is one of four bases: adenine (A), uracil (U), cytosine (C) or guarnie (G). Different types of therapeutic RNAs exist including: messenger RNA (mRNA) and short interfering RNA (siRNA).



NNA-based drugs are a new class of pologics on the pain to become a major platform in drug development alongside small molecules and other biologics which grant unprecedented specificity and control over protein expression (ref). Based on the accumulated results of long-term research in the field of RNA therapy spanning several decades, therapeutic agents for various diseases are being rapidly developed. Since 2018, four short interfering RNAs (siRNA) (Onpattro, Givlaari, Inclisiran, and Oxlumo) targeting liver were approved by American and European regulatory agencies, joined in 2020 by the first two mRNA-based vaccines against SARS-CoV-2. These therapeutics tend to target diseases that cannot be treated with other conventional drug groups, and several clinical studies are underway for a variety of RNA-based therapeutics against various incurable diseases (Young-Kook Kim, p. 455).

The historical timeline of important discoveries in RNA biology and key developments in RNA therapy.

Source: Young-Kook Kim, RNA therapy: rich history, various applications and unlimited future prospects (Experimental & Molecular Medicine (2022) 54:455-465).

5) Partners



Partners

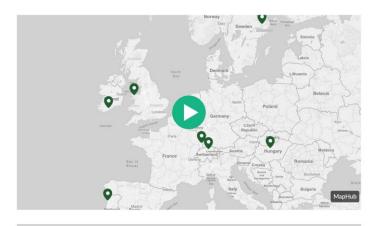
"The multidisciplinary team in GENEGUT will pioneer the development of the next generation of therapeutics for the treatment of IBD'



GENEGUT brings together 9 partners from 8 European countries covering the lifecycle from bench to bedside

Through a patient-centred approach and grown out of the recent Cost Action UNGAP (CA16205), GENEGUT brings together a patient iation with renowned researchers, expert clinical scientists, SMEs and large pharma companies with expertise and patented technologies in global proteomics, nanotechnologies, cyclodextrin synthesis, multicellular models, drug delivery systems and production as well as innovation management, stakeholder involvement and science communication.

GENEGUT benefits from the special partnership between the University College Cork's School of Pharmacy, represented by GENEGUT project coordinator Prof. Caltriona O'Driscoll, and the APC Microbiome Ireland SF1 Research Centre under principal investigator and Consultant Gastroenterologist Prof. Subrata Ghosh. Both research groups share a long history of fruitful collaboration, and a track record of translational research in the field of drug delivery and the treatment of inflammatory bowel disease. This partnership unites pre-clinical and clinical skills and will enable the UCC team to join forces for the development of an RNA-based therapy for iteal CD.



University College Cork (UCC)

School of Pharmacy APC Microbiome

- · Synthesis, formulation and characterisation of therapeutic RNA-based nanoparticles
- Cellular specificity and mechanism
- · Proof of efficiacy under diseased conditions











Page 16 of 18



6) News







PhD position in GENEGUT The GENEGUT consortium is currently looking for an exceptionally enthusiastic, creative, and driven PhD student with a passion for interdisciplinary science. Find the open position

GENEGUT officially kicked-off

The GENEGUT project is officially kicked-off! On September 26, 2022, the GENEGUT consortium got together for a half-day virtual kick-off meeting, setting the project up



Event Calendar

official start of GENEGUT

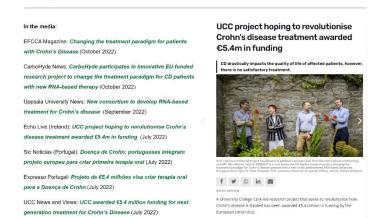
GENEGUT General Assembly, Cork, IE



7) Media



Media



Press Release

Download the first official GENEGUT press release here.

