



INTRODUCING THE

GENIUS COMPETITION

Genetically ENgineered Ideas for Unconventional Solutions



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the European Union

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MI-DNA DISC



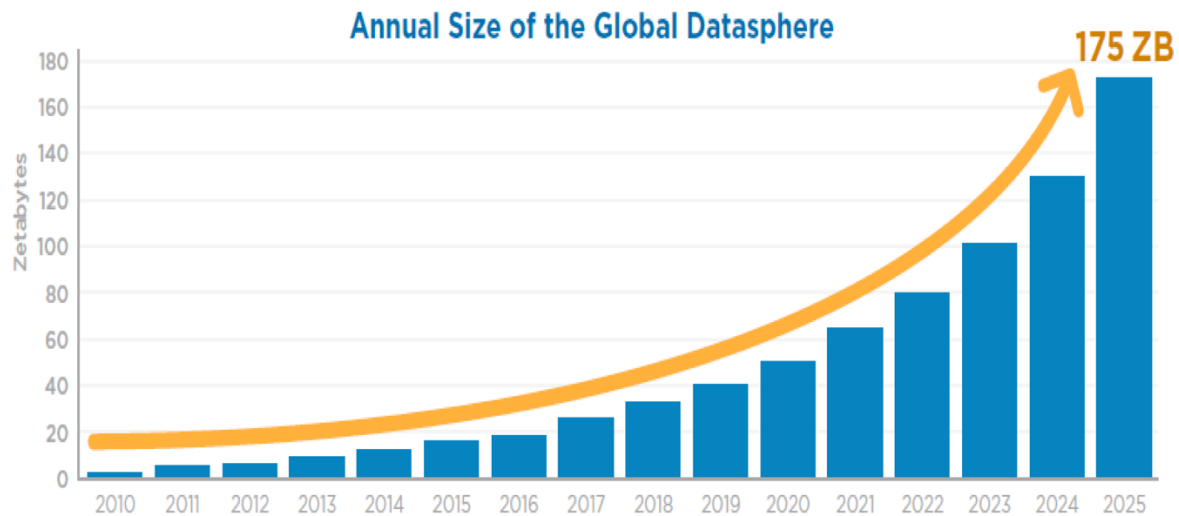
we are working on microbe-based DNA data storage



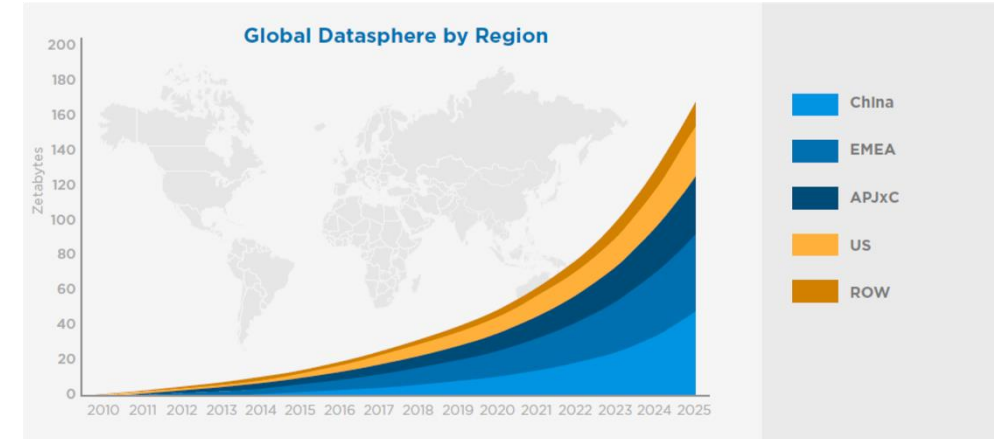
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The global datasphere



Source: Data Age 2025, sponsored by Seagate with data from IDC Global DataSphere, Nov 2018



Source: IDC's Data Age 2025 study, sponsored by Seagate

Unit	Definition	Bytes
Kilobyte (KB)	1 KB = 1024 bytes	1,024
Megabyte (MB)	1 MB = 1024 KB	1,048,576
Gigabyte (GB)	1 GB = 1024 MB	1,073,741,824
Terabyte (TB)	1 TB = 1024 GB	1,099,511,627,776
Petabyte (PB)	1 PB = 1024 TB	1,125,899,906,842,624
Exabyte (EB)	1 EB = 1024 PB	1,152,921,504,606,846,976
Zettabyte (ZB)	1 ZB = 1024 EB	1,180,591,620,717,411,303,424
Yottabyte (YB)	1 YB = 1024 ZB	1,208,925,819,614,629,174,706,176

DNA based data storage

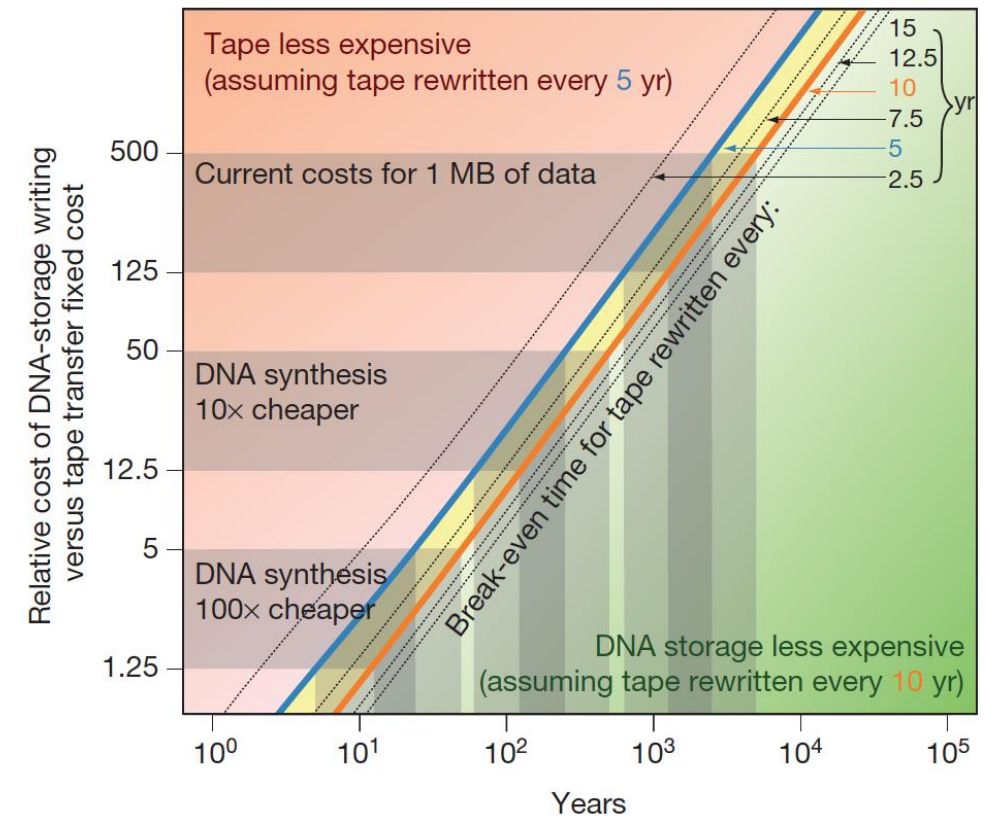
STORAGE LIMITS

Estimates based on bacterial genetics suggest that digital DNA could one day rival or exceed today's storage technology.

	 Hard disk	 Flash memory	 Bacterial DNA
Read-write speed (μ s per bit)	~3,000–5,000	~100	<100
Data retention (years)	>10	>10	>100
Power usage (watts per gigabyte)	~0.04	~0.01–0.04	< 10^{-10}
Data density (bits per cm^3)	~ 10^{13}	~ 10^{16}	~ 10^{19}

WEIGHT OF DNA NEEDED TO STORE WORLD'S DATA
 ~1 kg

you can store ~ 1 ZB / gram of DNA



Concept & challenge

The major bottleneck for DNA data storage are the synthesis costs

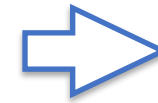
- improvements in chemistry?
- enzymatic DNA synthesis?
- biotechnological mass production?



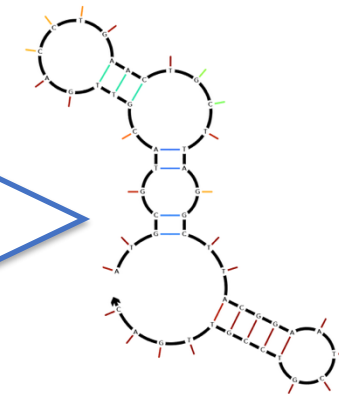
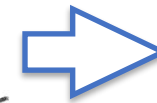
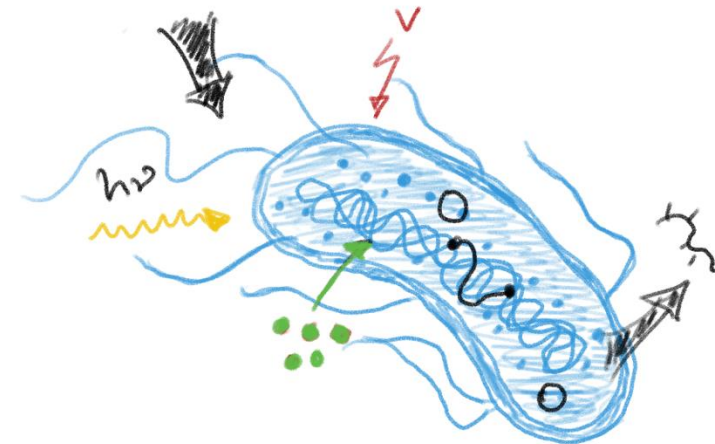
arbitrary sequences

```
ATGCGTACGTTGA
CCTGAACTGCTTA
GGCTTACGGAATC
GTCCGTTGAC
```

VISION



external control



molecular output

MI DNA DISC
GENIUS award:

Are there new application areas for cheap and programmable in vivo production of arbitrary DNA sequences?



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MI·DNA DISC

**WE NEED YOU,
GENIUS!**

WHY... GENIUS?

1 Driving European innovation:

The **MI-DNA DISC** project is an elite European collaborative project pioneering a groundbreaking new technology thanks also to an open innovation approach.

2 A team of leading experts:

The spirit of MI-DNA drives us to unite the entire community, giving students and researchers the chance to work with leading expert in the field.

3 The critical next step:

Our goal is to rapidly identify **real-world use cases** that maximize the technology's positive effect on the population.



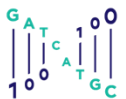
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WHY... YOU?

To achieve this scale and impact, we need to **tap into your creativity and your out-the-box approach** and give a **voice to the broader community.**



WHAT WE ARE LOOKING FOR



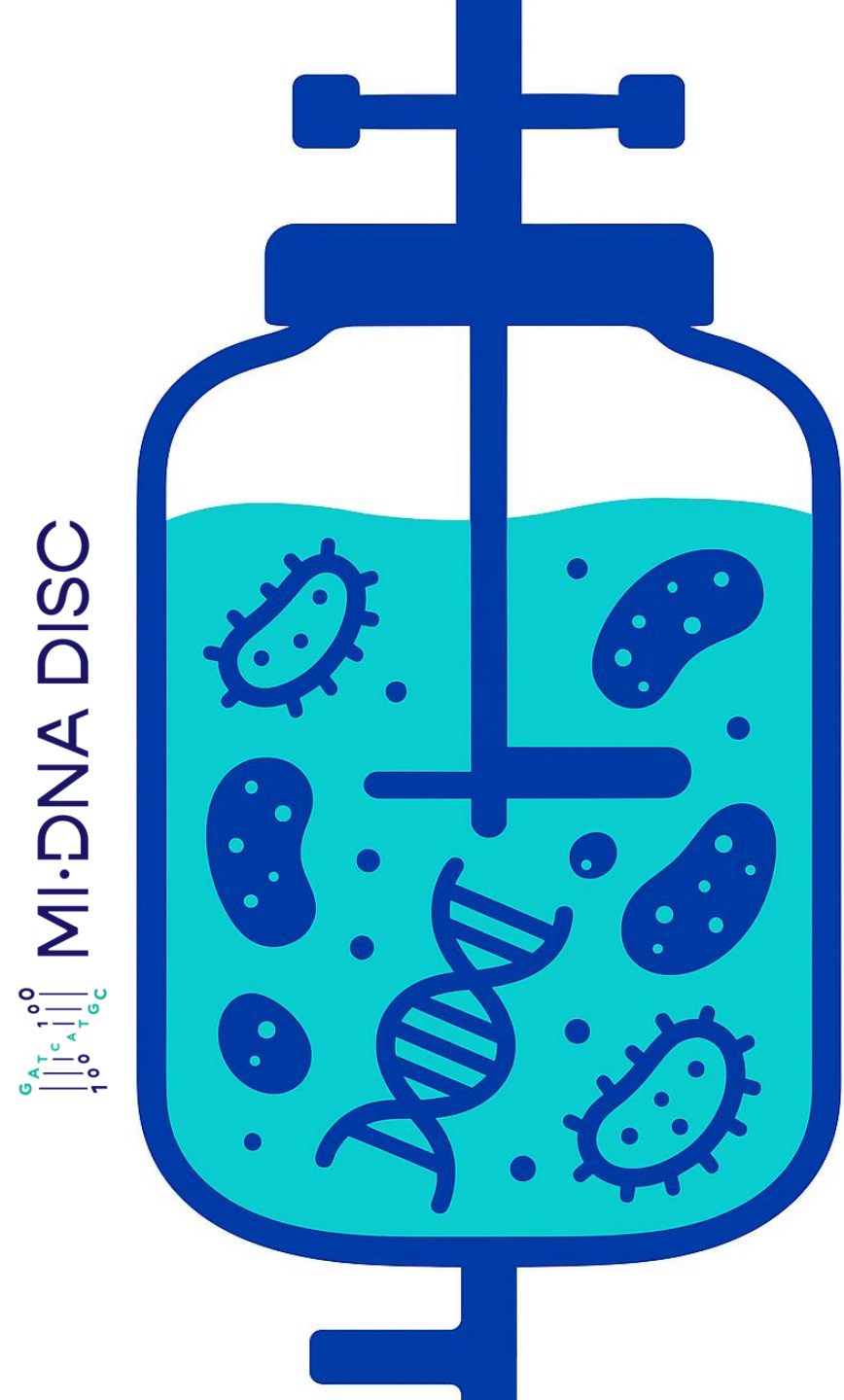
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THE TECHNOLOGY BEHIND

A **bioreactor** capable of growing a bacterium population containing the **unique DNA sequence**.

The selected bacteria can be able to receive and amplify a single oligo and release it in response to a light stimulus.

- *E.Coli Bacillus subtilis*
- DNA length from 500 to 10000 bp
- T: 0-37°C
- Efficiency of transfection: 20-90%



THE GENIUS COMPETITION ROADMAP



THE GENIUS COMPETITION ROADMAP

1

GENIUS
COMPETITION
LAUNCH

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THE GENIUS COMPETITION ROADMAP

1 GENIUS
COMPETITION
LAUNCH

2 REGISTRATION
TO THE GENIUS
COMPETITION

THE GENIUS COMPETITION ROADMAP

1 GENIUS
COMPETITION
LAUNCH

2

REGISTRATION
TO THE GENIUS
COMPETITION

3

PROPOSAL
SUBMISSION
DEADLINE



MI-DNA DISC

THE GENIUS COMPETITION ROADMAP

1 GENIUS
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2 REGISTRATION
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3 PROPOSAL
SUBMISSION
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4 PROPOSAL
EVALUATION



MI-DNA DISC

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4

PROPOSAL
EVALUATION

5

WINNING
PROPOSAL
AND PRIZE



THE GENIUS COMPETITION ROADMAP



GENIUS PHASE BY PHASE

PHASE 1

GENIUS COMPETITION LAUNCH

13 October 2025

The competition is introduced at TUM to students and researchers during an in-person and online event.

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PHASE 2

REGISTRATION TO THE GENIUS COMPETITION

15 Oct. 2025 – 31 Dec. 2025

Students and researchers will be able to register to the competition via the dedicated webpage where info and docs will be available.



MI-DNA DISC

GENIUS PHASE BY PHASE

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13 October 2025

The competition is introduced at TUM to students and researchers during an in-person and online event.

PHASE 2

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15 Oct. 2025 – 31 Dec. 2025

Students and researchers will be able to register to the competition via the dedicated webpage where info and docs will be available.

PHASE 3

PROPOSAL SUBMISSION DEADLINE

**15 January 2026 @5pm
(Brussels time)**

Participants will submit their proposal.



GENIUS PHASE BY PHASE

PHASE 4

PROPOSAL EVALUATION

20 March 2026

The submitted proposals will be evaluated by a MI-DNA DISC committee of experts.

GENIUS PHASE BY PHASE

PHASE 4

PROPOSAL EVALUATION

20 March 2026

The submitted proposals will be evaluated by a MI-DNA DISC committee of experts.



PHASE 5

WINNING PROPOSAL AND PRIZE

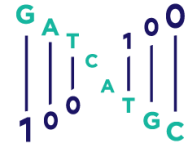
23 March 2026

The winning participant or team of participants will be announced!



FOR MI-DNA, FOR SCIENCE, AND FOR THE PRIZE:)

- **€ 1000,00** prize
- **3-Month Online incubation** with **Day One** to jointly refine and accelerate your idea from concept to reality
- Present your idea directly to the **MI-DNA DISC consortium** at an upcoming **in-person meeting**



MI-DNA DISC



GENIUS PHASE BY PHASE

PHASE 4

PROPOSAL EVALUATION

20 March 2026

The submitted proposals will be evaluated by a MI-DNA DISC committee of experts.



PHASE 5

WINNING PROPOSAL AND PRIZE

23 March 2026

The winning participant or team of participants will be announced!



PHASE 6

IDEA INCUBATION WITHIN THE MI-DNA CONSORTIUM

2026

The winner will attend an in-person meeting with the MI-DNA DISC consortium to present the concept for future development.



MI-DNA DISC

HOW TO APPLY

Apply following the template (1/7)

1. Abstract

Maximum length: 250 words

- What is the core idea?
- What problem or opportunity does it address?
- What is the envisioned role of the engineered bacteria?
- In which context would this application be used (e.g., medicine, environment, education)?
- Why is this idea worth exploring?

Submission template

1. Abstract

Maximum length: 250 words

Purpose:

Clearly and concisely present your idea. This section sets the stage by summarizing the application you are proposing and its relevance. It should capture the reader's interest and provide a clear understanding of what your proposal is about.

You should address:

- *What is the core idea?*
- *What problem or opportunity does it address?*
- *What is the envisioned role of the engineered bacteria?*
- *In what context would this application be used (e.g., medicine, environment, education)?*
- *Why is this idea worth exploring?*



HOW TO APPLY

Apply following the template (2/7)

2. Application Description

Maximum length: 800 words

- What specific problem or opportunity does your application address, and what makes it relevant today?
- In which setting would the application be deployed (e.g., clinical therapy, industrial biomanufacturing, environmental sensing)?
- How does your system operate, from stimulus to DNA release to outcome?
- What existing technologies or solutions currently address this problem?

2. Application Description

Maximum length: 800 words

Purpose:

Describe in detail the proposed application, how it works, and what value it brings. This is the core of your proposal. It should demonstrate both creativity and a solid understanding of the technological context. Visuals such as diagrams, tables, or schematics are strongly encouraged to support clarity and comparison.

You should address:

- *What specific problem or opportunity does your application address, and what makes it relevant today?*
- *In which setting would the application be deployed (e.g., clinical therapy, industrial biomanufacturing, environmental sensing)?*
- *How does your system operate, from stimulus to DNA release to outcome?*
- *What existing technologies or solutions currently address this problem? Provide a comparison - technical, economic, or practical - that highlights what your solution adds or improves. Use comparative tables or figures where helpful.*



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HOW TO APPLY

Apply following the template (3/7)

3. Impact Potential

Maximum length: 400 words

- Who are the primary users of this application, and what needs or challenges does it solve for them?
- What benefits could this application generate—social, clinical, industrial, or environmental?
- How does it contribute to a larger goal or need (e.g., sustainability, equity, accessibility)?
- What measurable outcomes could result from its use?

3. Impact Potential

Maximum length: 400 words

Purpose:

Present the expected impact of your application, with a clear focus on its intended users and beneficiaries. This section should explain who will benefit, how, and why this matters in a broader societal or economic context.

You should address:

- *Who are the primary users of this application, and what needs or challenges does it solve for them?*
- *What benefits could this application generate—social, clinical, industrial, or environmental?*
- *How does it contribute to a larger goal or need (e.g., sustainability, equity, accessibility)?*
- *What measurable outcomes could result from its use?*



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HOW TO APPLY

Apply following the template (4/7)

4. Technical Feasibility

Maximum length: 400 words

- What are the main development stages for implementing the concept (e.g., design, testing, integration)?
- Which parts of the system are already available or feasible with current technology, and which are experimental or speculative?
- What are the main technical constraints (e.g., safety, scalability, containment)?
- Are there foreseeable bottlenecks or critical unknowns that will need to be addressed?

4. Technical Feasibility

Maximum length: 400 words

Purpose:

Demonstrate that your idea is grounded in biological and technological plausibility. This section should identify what development work is needed, and whether the key components already exist, need adaptation, or require invention. Use the structure provided to indicate the maturity of the idea.

You should address:

- *What are the main development stages for implementing the concept (e.g., design, testing, integration)?*
- *Which parts of the system are already available or feasible with current technology, and which are experimental or speculative?*
- *What are the main technical constraints (e.g., safety, scalability, containment)?*
- *Are there foreseeable bottlenecks or critical unknowns that will need to be addressed?*

HOW TO APPLY

Apply following the template (5/7)

5. Originality of the Idea

Maximum length: 300 words

- What makes this concept novel in terms of function, context, or mechanism?
- Are you introducing a new problem area for this technology or reimagining how it could be used?
- Does the application reflect a unique perspective or an unconventional combination of ideas?
- Why do you think this specific application has not been widely explored yet?

5. Originality of the Idea

Maximum length: 300 words

Purpose:

Explain why your idea is original and how it differs from other known solutions. This section should showcase your inventiveness and your ability to think beyond conventional uses of technology.

You should address:

- *What makes this concept novel in terms of function, context, or mechanism?*
- *Are you introducing a new problem area for this technology or reimagining how it could be used?*
- *Does the application reflect a unique perspective or an unconventional combination of ideas?*
- *Why do you think this specific application has not been widely explored yet?*



HOW TO APPLY

Apply following the template (6/7)

6. Preliminary Market Analysis

Maximum length: 400 words

- What is the potential market size in Europe and/or globally for this application? Provide a qualitative or quantitative estimate
- Who are the key stakeholders in this space? Identify potential adopters, funders, partners, or users.
- Are they primarily large organizations, many smaller actors, or a mix?
- What motivates them, and what challenges might they face in adopting such a technology?
- What barriers to entry exist (e.g., regulatory, economic, cultural), and how might these be overcome or addressed in the early stages?

6. Preliminary Market Analysis

Maximum length: 400 words

Purpose:

Offer an early, well-reasoned analysis of the potential market landscape. While this is not a business plan, a first approximation of market size and dynamics is essential. Use visuals like graphs or tables to clarify your findings and emphasize the real-world relevance of your idea.

You should address:

- *What is the potential market size in Europe and/or globally for this application? Provide a qualitative or quantitative estimate, with data sources or assumptions clearly stated.*
- *Who are the key stakeholders in this space? Identify potential adopters, funders, partners, or users. Are they primarily large organizations, many smaller actors, or a mix? What motivates them, and what challenges might they face in adopting such a technology?*
- *What barriers to entry exist (e.g., regulatory, economic, cultural), and how might these be overcome or addressed in the early stages?*



HOW TO APPLY

Apply following the template (7/7)

7. Future Vision

Maximum length: 300 words

- How might your solution scale or adapt to other use cases?
- Could it become part of a larger platform, system, or ecosystem?
- What long-term potential do you see in its development or integration with future technologies?

7. Future Vision

Maximum length: 300 words

Purpose:

Articulate how your idea could evolve over time. This section should place your concept in a broader perspective - technologically, commercially, or socially.

You should address:

- *How might your solution scale or adapt to other use cases?*
- *Could it become part of a larger platform, system, or ecosystem?*
- *What long-term potential do you see in its development or integration with future technologies?*



LET'S WRAP-UP

REGISTRATION TO THE COMPETITION:

15 October-31 December 2025

ELIGIBILITY:

Submission are welcome from both individual applicants or teams

PROPOSAL SUBMISSION DEADLINE:

15 January 2026 @5pm (Brussels time)

WINNER ANNOUNCEMENT:

23 March 2026

PRIZE:

- **€ 1000,00** prize
- **3 months incubation** with Day One online
- **In person meeting** with MI-DNA DISC consortium in the next coming meeting



LET'S WRAP-UP

REGISTRATION TO THE COMPETITION:

Go to:

<https://www.midnadic.eu/genius-competition>

And **fill the registration form** to officially register to the competition.

Please **follow MI-DNA DISC LinkedIn page** to get regular updates on the status of the competition:

<https://www.linkedin.com/company/midnadic>



Q&A

Any questions?





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THANK YOU!

www.midnadisc.eu



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Partners

