

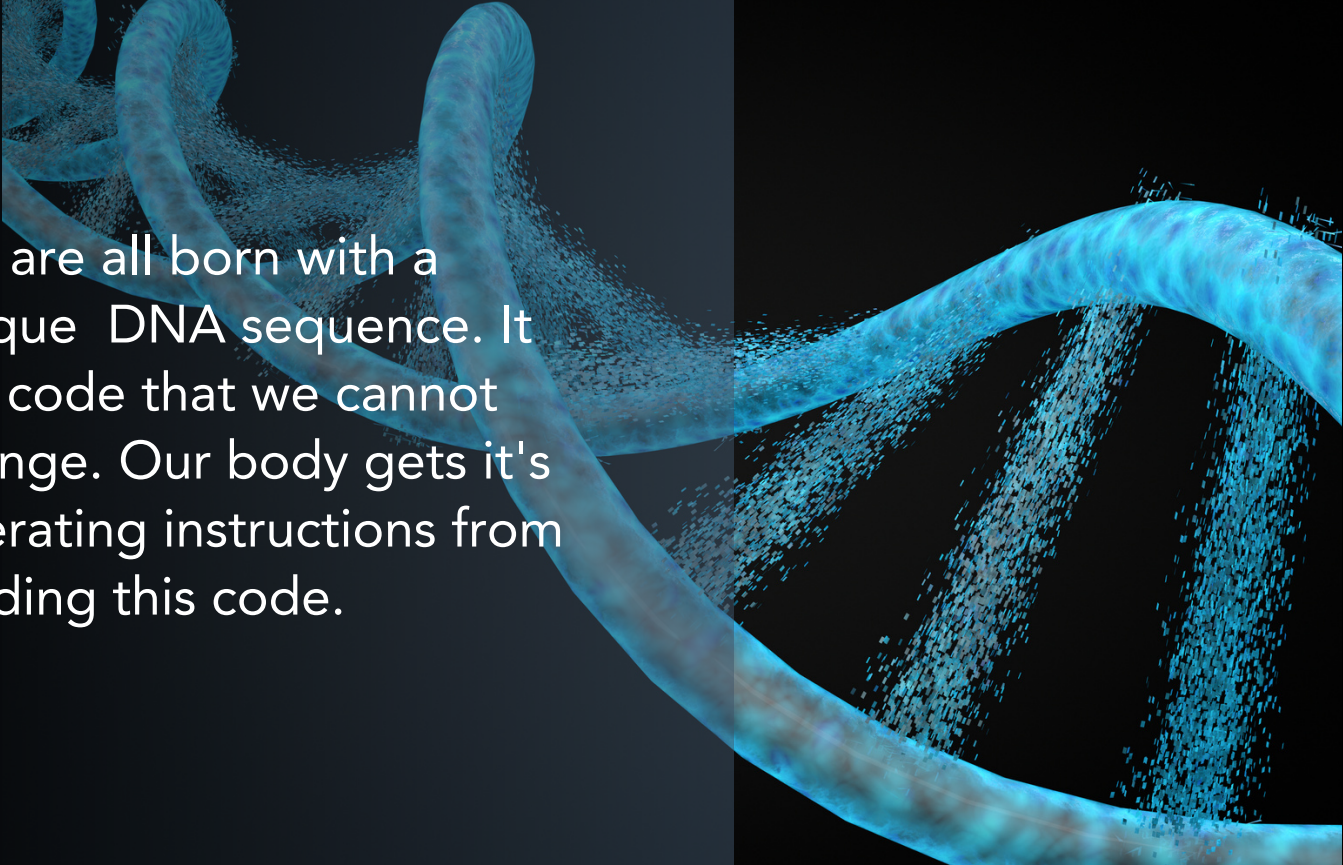


KYROGENE

master
of
genes

Epigene therapy
to help prevent, manage or reverse
autoimmune disorders

The Science



We are all born with a unique DNA sequence. It is a code that we cannot change. Our body gets its operating instructions from reading this code.

However, we can change how the code is read. We can even block part of the code from being read... or from being over read.

This is the role of epigenetics.

The Need

A combination of external and environmental factors such as diet, pollution, compromised food chain, toxic cosmetics, harmful personal care products and supposedly benign medicines can trigger auto immune diseases...



... such as Lupus, Type1 Diabetes, Hashimoto's, Systemic Sclerosis, Psoriasis, Rheumatoid Arthritis the list and their prevalence are growing at an alarming rate.

Neither modern medicine nor alternate medicine has a proven cure as yet for most of the auto immune diseases.

The Challenge

Each human is unique.
Each DNA is unique.

Any change in external parameters has a different effect on each individual.

Even identical twins are not identical because their epigenetics are different.

As a result, each person has a different response to adverse external factors.

Given the hundreds of parameters involved, it becomes a "NP hard*" problem to solve using standard computational tools.

*In computational complexity theory, NP-hardness (non-deterministic polynomial-time hardness) is the defining property of a class of problems that are informally "at least as hard as the hardest problems in NP"

The Approach



Kyrogene takes inspiration from Google Maps. Google Maps has solved an 'NP hard' problem by using data provided by the overall body of users. Using this data, google gives each user his desired unique path instantly.

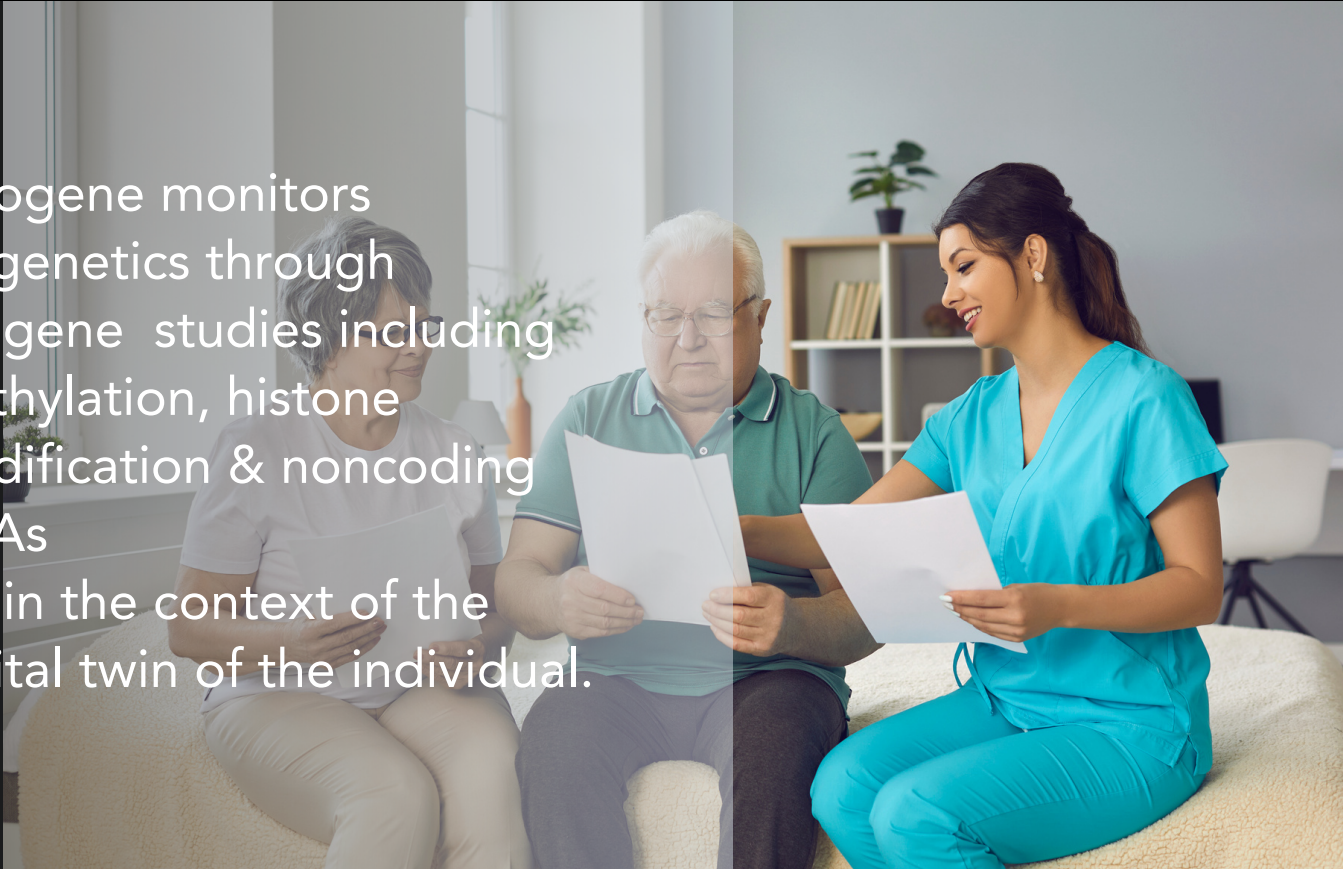
It also changes the path depending on real-time inputs from around the chosen path.

Thus as more and more people join the platform - the accuracy of the system keeps increasing.

The Solution

Kyrogene monitors epigenetics through

- gene studies including methylation, histone modification & noncoding RNAs
- in the context of the digital twin of the individual.



Kyrogene's 5-step process

Kyrogene baseline [Kodoy Digital Twin] set to zero
Make changes in external factors
Kyrogene scorecard quantifies the impact of changes
Make iterations and repeat assessment
Keep progressing as the scorecard keeps improving

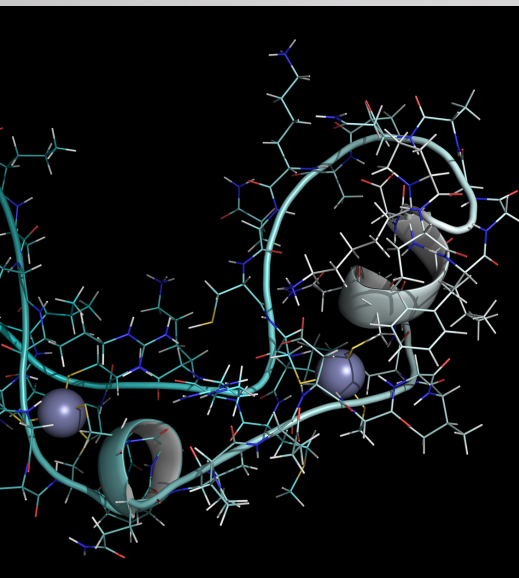
Finding the needle in a haystack

Once this causal relationship is established:

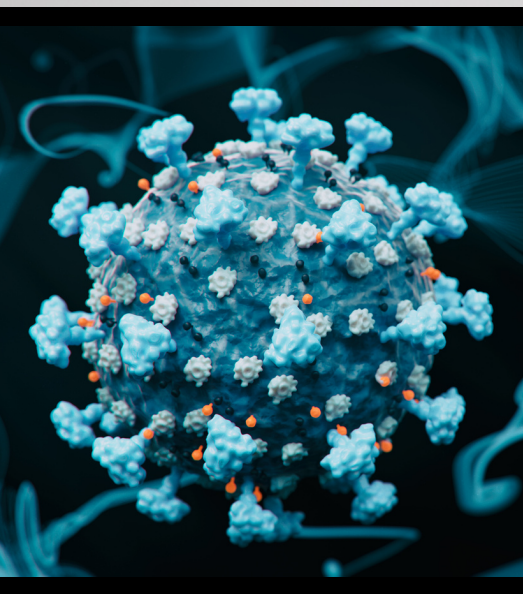
- Kyrogene can determine the exact gene that needs to be modulated &
- identify the precise changes in external factors which could trigger this modulation.

Using this approach, certain diseases are expected to be cured, prevented, eliminated or made milder in some cases.

Kyrogene is not a healthcare company. Kyrogene uses data science on digital twins to help a doctor to find the root cause external factor that is triggering or worsening the auto immune disease.



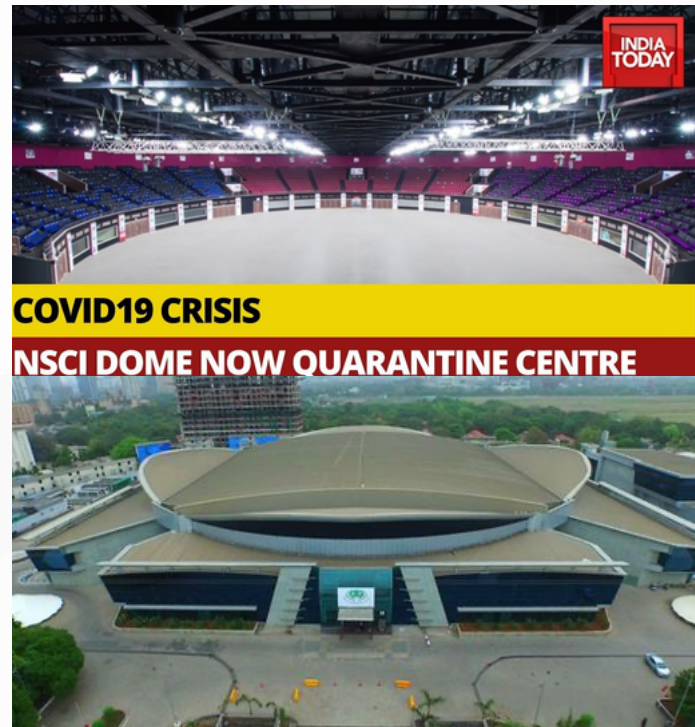
Kyrogene was established in 2021 as part of the MegaLab initiative of the IIT Alumni Council



Kyrogene approach was tested to predict & prevent cytokine storms

NSCI Dome was a contactless Covid hospital with containerised ICU beds.

A sports stadium was transformed within hours into a covid hospital with paper beds, designer bed sheets, live entertainment and fully computerised operations all unlike any conventional hospital.



The company was part of the first cohort of the MegaLab incubator. This gave it direct access to some of the brightest minds in genomics and bio-engineering.

The business model of the company is to charge for the epigenetic assessments/recommendations.

IIT Alumni Council announces world's largest Mega Incubator to fight virus

Sunday, 19 July 2020 | TN RAGHUNATHA | Mumbai

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In a significant global initiative, the IIT Alumni Council on Saturday announced world's first and largest Engineered Biomolecule Mega Incubator (EBMI) —involving 2.5 million square feet area—to align start-ups, other incubators and accelerators in India's offensive against Covid-19.

The ambitious project involves setting up of Biosafety Level-3 (BSL3) laboratory in the National Center for Nanoscience and Nanotechnology at Kalina Campus of University of Mumbai, a captive 100,000 sq. ft pilot plant facility for biomolecule manufacturing in the National Capital Region (NCR), a mega incubator to support MegaLab and MegaTx (to be part funded by MegaFund), Rs 500 crore direct investment envisaged in Phase 1 and Rs 10,000 crore-plus ecosystem investment.

As part of the EBMI project, NCR will be developed as a global hub for Biologics manufacturing.

The proposed EBMI will have direct access to over 30,000 PhDs through Top Institutes of Excellence" Network (TieNet) and a virtual presence in every smartphone. Engineered biomolecules is expected to play a key role in molecular diagnostics, genetic testing as well as biotherapeutics, besides a host of applications in sectors varying from water treatment and agriculture to advanced genetics.

Announcing the EBMI initiative, IIT Alumni Council President Ravi Sharma said that his organisation was playing a lead role in strengthening the entire Covid ecosystem - from diagnostic testing to biotherapeutic treatment.

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Fighting Covid-19: IIT Alumni Council launches Engineered Biomolecule Mega Incubator, to invest ₹500 crore in phase 1

Updated - July 17, 2020 at 12:23 PM | Mumbai, July 17

BY RAJESH KURUP

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The initiative is to align start-ups in India's offensive against the Covid-19 pandemic

The initiative is to align start-ups in India's offensive against the Covid-19 pandemic | Photo Credit: ismagilov

The IIT Alumni Council has launched Engineered Biomolecule Mega Incubator (EBMI), an initiative to align start-ups in India's offensive against the Covid-19 pandemic.

The council will make a direct investment of ₹500 crore in phase 1 of EBMI, and an ecosystem investment upwards of ₹10,000 crore. The National Capital Region

media...

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IIT Alumni Council, CSIR-IGIB to jointly conduct Covid-19 research, patient data analysis

Updated - July 08, 2020 at 05:24 PM | Mumbai, June 8

BY RAJESH KURUP

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The IIT Alumni Council has signed an agreement with CSIR Institute of Genomics and Integrative Biology (CSIR-IGIB) to jointly conduct Covid-19 research and patient data analysis.

The council has also handed over the world's largest imaging data of 8,500 patients from the National Sports Club of India Dome (NSCI Dome) in Mumbai to CSIR-IGIB. This data will soon be available in de-identified form, on an open data platform, which is being set up by IIT Alumni Council, CSIR-IGIB and Indian Council of Medical Research (ICMR) to help in the research to bring the pandemic under control.

The NSCI Dome in Mumbai was earlier converted into a special observation zone for Covid-19 patients.

The joint research by CSIR-IGIB and IIT Alumni Council will focus on creating an ecosystem for Covid-19 diagnostics, therapeutics and preparedness. The ecosystem will enable a value chain with expertise, spanning digital health, Artificial Intelligence (AI), molecular diagnostics, next-generation sequencing, antibody harvesting, and production of monoclonal antibodies.

BSE and IIT Alumni sign pact: To encourage startups listing

July 13, 2020

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and other technologies.

On July 13, 2020, the Bombay Stock Exchange (BSE) and IIT Alumni Council signed a pact to encourage listing of startups. The pact will help to develop high investor depth platform for startup companies.

The platform is to be developed using Artificial Intelligence

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IIT Alumni Council to set up 6 research centres for startups

1 min read • 04 Sep 2020, 07:17 PM IST

PTI

The IIT Alumni Council will set up six research centres to make modern equipment and research tools in six cutting-edge domains available to startups registered with its MegaIncubator initiative



IIT Alumni Council to set up 6 research centres for startups (MINT)

The IIT Alumni Council will set up six research centres to make

Kyrogene business model, scalability, innovation & socio-economic impact on environment

Kyrogene's business model is built around fees for the baseline assessment & additional fees for each subsequent assessment. The current charges are Rs 10 lacs for the baseline assessment & Rs 1 lac for each following assessment. The company waives the fee for those from economically weaker strata. In other cases, discounts are given to the extent possible.

Since the assessment model is based on data science, as more and more people join the assessment platform - the efficacy of the assessment & consequent recommendations keep increasing. At the same time, the cost keeps reducing. Thus, it is possible that the cost of assessment could reduce by an order of magnitude within a couple of years.

Kyrogene's innovation is in the ability of the data stack to precisely & accurately detect the gene or the set of genes that need to be modulated. And then to correctly identify and quantify the change in external factors required to trigger the switching on and off of the genes (called gene modulation).

In addition to the direct cost of managing an illness, there's a more significant cost to society in the form of a drop in productivity & related costs. When a disease is prevented, both the direct and indirect costs are avoided. This is the central role of the use of precision medicine on a preventive basis.

The assessments carried out by Kyrogene depend on the digital twin created by service providers like Kodoy, who are beyond the company's control. Any error in creating the digital twin will reflect in an error in the assessment.

The Kyrogene data platform focuses solely on autoimmune disorders triggered by external factors. Some diseases may have multiple causes, such as genetics, adverse reaction to surgeries, etc. In such cases, the condition does not fall in the category of autoimmune disorders triggered by external factors such as diet, pollution, medication etc. The Kyrogene approach may not thus achieve desired results in such cases.