The DeBio Network Whitepaper

The Anonymous-First Platform for Medical and Bioinformatics Data

Agustinus Theodorus, Pandu Sastrowardoyo, Ibnu Gamal Alhadid &

Kevin Janada

Introduction To DeBio Network

DeBio (pronounced dɪbʌɪˈɒ)

The DeBio Network is a decentralized anonymous-first platform for medical and bioinformatics data specializing in genetics testing.

Genetics testing has experienced explosive growth in recent years due to its applications in identifying diseases and health risks — as well as a rising interest in ancestral tracing. But with this increase in growth has also come an increase in ethical concerns regarding an individual's right to autonomy, privacy, and confidentiality.

Discussion

Genetic testing is a promising technology that may assess an individual's inherent risk for disease and disability. Genetically determined risk predictions can be used to design treatments based on genetic and non-genetic factors — and even cure or eliminate some diseases via gene-editing technologies.

But the predictive nature inherent in genetic testing also makes it liable for misuse. Individuals have been denied health care, insurance, and employment, 🔗 based on knowable genetic dispositions. This misuse is generally referred to as "genetic discrimination."

Addressing Genetic Discrimination

In response to ongoing genetic discrimination, GINA (the Genetic Information Nondiscrimination Act, 2008) 🔗 was passed in the US to prevent group health and Medicare supplemental plans (excluding long-term care plans, life, and disability insurance) from using genetic information to discriminate against individuals for insurance purposes.

GINA Title II, 2009 🔗 followed up to prohibit the use of genetic information in making employment decisions. But it only applies to employers with 15 or more employees. Furthermore, these laws are based on older testing technology, limited in scope, and only apply in America. They are unable to provide the broad span of privacy protection required of the ever-evolving space genetics testing has become.

The basic systemic ethical problem with genetic testing solutions today is that they are centralized. An individual permanently loses their autonomy once they provide their genetic material to a third-party testing service, increasing the risk of their genetic data being used against them🔗 .

Genetic discrimination can have severe and permanent consequences on an individual's livelihood and socio-economic freedom. The World Health Organization has acknowledged 🔗 the damage that released genetic data can cause to an individual and his or her relatives.

Government Agencies Access to Genetic Data

Law enforcement agencies have even started exploiting third-party consumer genomics services to trace suspects by finding their distant genetic relatives. This means that your genetic data can be traced back to you via a distant relative's genetic test results even with the simplest of basic demographic data 🔗 known about you, such as your age and state.

Because genetic data is not unique to you but rather unique to your family tree, by using a centralized bioinformatics service, you may unknowingly not only put your privacy at risk but also the privacy of your near-relatives. To date, most Americans of European descent🔗 can already be identified through the DNA of distant relatives they may not even be aware exist.

Solutions for the Genetic Testing Market and its Users

DeBio eliminates risks of genetic discrimination by leveraging blockchain technology and high-level encryption to protect identity — while allowing users to access the benefits of genetic testing.

Individuals who use DeBio's anonymous bioinformatics services are not required to provide any demographic data. Their identity is not accessible by any testing labs. And any other data they may provide is fully encrypted and inaccessible by third parties without their permission.

To further increase privacy and anonymity, DeBio processes all genetic testing payments using cryptocurrencies so that even financial transactions about genetic testing are nearly untraceable to the users.

Any service on the DeBio platform is provided for research, informational, and educational use only. The platform does not provide medical or diagnostic advice. Users should always seek the advice of their physicians or other health care providers with any questions they may have regarding diagnosis, cure, treatment, mitigation, or prevention of any disease or other medical condition or impairment or the status of your health.

Consumers' Increasing Data Privacy Concerns

Today's consumers are voicing concerns about entering a dystopian reality where they lose control over their identity. Fewer people today trust that governments, corporations — and any other third parties — have their best interests in mind in regards to their unalienable rights to privacy.

While 87% of consumers today ✍ believe that data privacy is a human right, data breaches such as the Equifax Data Breach in 2017 and Cambridge Analytica in 2018 continue to plague innocent individuals. Frustration from privacy scandals has increased the demand for regulations, such as the GDPR✍ (General Data Protection Regulation) and CCPA✍ (California Consumer Privacy Act). But these regulations, while educational to the consumer, are punitive after privacy has been compromised and potential damage may have already been done.

Holes in Current Health Data Privacy Protections

HIPAA (the Health Insurance Portability and Accountability Act) is a federal US law designed to prevent the disclosure of sensitive patient health information (PHI). Like other health information, to be protected by HIPAA, genetic data must first meet the definition of protected health information (PHI) ✍. But even PHI (including genetic data) can be released without a patient's consent for treatment, payment, or health care operations reasons (TPO)✍.

For example, under HIPAA, genetic data can be shared freely amongst doctors and other providers for treatment purposes, with insurance companies for payment purposes, and within some internal operations of the health care entity itself. PHI can also be disclosed if required by state or other law. In the US, state laws may vary ✍, confusing the space.

It's also important to note that HIPAA only applies to healthcare organizations it considers a "covered entity" or a "business associate."✍. It has no power over companies that collect genetic data online like 23andMe ✍ and genealogy websites such as Ancestry.com ✍

DeBio feels that the global attempts to protect genetic data, along with other personally identifying data, fail in eliminating risk to the users. The possibility of our personal information and genetic data being misused is a serious concern.

Coincidentally, this increasing demand for consumer privacy solutions just happens to be growing in parallel with the popularity of genetics testing.

Consumer Market Review and Forecast

Consumer demand for genetic testing has exploded over recent years. Fueled by mounting concerns over genetic disorders and cancer, fascination with genetics genealogy, and the availability of take-home DNA testing kits, data has shown that the consumer genetics testing market grew thirty-six times between 2013 and 2018.

Up, Up and away

Total number of people tested by consumer genetics companies, in millions

● AncestryDNA only   ● All major testing companies
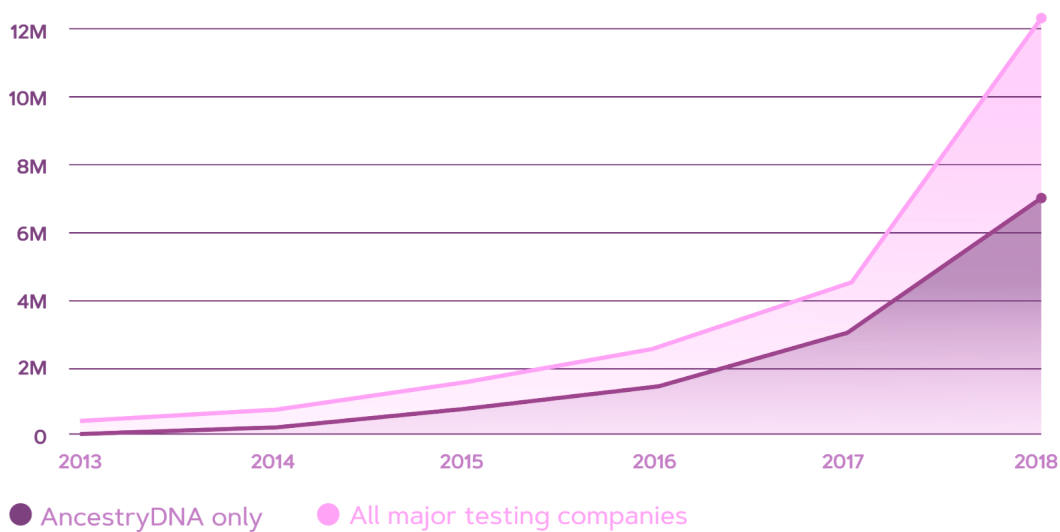
Graph by **Antonio Regalado** from **MIT Technology review**

In 2016, a market review by Grand View Research 🔗 predicted that the genetic testing market would reach 10B USD by 2022. Yet as 2020 rolled in, the market value of genetic testing had already exceeded 10B 🔗 — beating that prediction by two years.

The use cases for genetic testing has expanded as well to include a myriad of applications from carrier testing for hereditary disorders, predictive testing for genetic variants, prenatal screening, pharmacogenetics to predict drug reactions, transplantation testing for genetic matches, and an increased personal interest in genealogy, to name a few.

Emerging Asia Pacific Market

While North America is currently the dominating market in genetic testing, due to an increase in healthcare expenditures and rising populations in nations like China and India, genetic testing in the Asia Pacific market 🔗 is expected to emerge as the fastest-growing regional market in the world.

Based in Singapore, DeBio's decentralized solution for anonymous genetic testing is situated in the heart of the Asia Pacific region. The DeBio Network is perfectly poised to offer genetic testing with consumer privacy solutions amid its hottest emerging market.

As the genetic testing market revenue is expected to hit 31B within the next 6 years, 🔗 DeBio is presently situated to capitalize on our expertise in cutting-edge blockchain technology, bioinformatics, and our strong belief in the inalienable right of privacy for individuals.

DeBio's Core Values

The DeBio Network adheres to core principles which include:

1. The Right of Privacy for Individuals

DeBio is a decentralized, anonymous-first, consumer-oriented protocol aligned with the growing belief that the right of data privacy and autonomy over personal information is a basic human inalienable right.

2. The Right for Individuals to Take Preemptive Measures on Their Health

While genetic testing is a relatively new technology, the implications for its use are groundbreaking genomes. For the first time in history, humans have the possibility of taking a heretofore impossible preemptive measure towards improving personal health and longevity.

3. Technological Innovation and the Right of Individuals to Participate Anonymously

While we acknowledge the scientific and technological innovation that made genetic testing possible, we insist that further effort is necessary to empower labs of all sizes to be able to collaborate on analyzing genetic and medical data **anonymously** to offer improved joint biomedical products.

Concept of The DeBio Network

A Physical-To-Digital Bridge for Anonymous Testing

For anonymity, users of DeBio Network only need to take two DNA samples via the buccal swab method or take samples of oral cells with cotton swabs. Then the user accesses our genetic testing marketplace to select our wide range of products and laboratory recommendations. The user then sends their sample to the laboratory within an envelope that is identifiable only by their public key void of any personally identifiable information.

The results (e.g, test and genome) are then encrypted with the user's public key and stored on decentralized storage. This allows users to maintain full control over their encrypted data—only their private keys can decrypt these results, and only through user control may the results be reused by another lab.

The DeBio Network team is also planning to expand this "physical-to-digital bridge" concept to use cases outside of the genetic testing market—which may include lab testing for diseases & other electronic medical record data or personal health information.

Sovereign Lab Collaboration to Offer Joint Products Integrating Services From Several Labs

After the user chooses a service and sends the DNA sample to a sovereign lab, the lab will be notified. When the sample arrives, the lab will begin sequencing the physical samples, and/or any requested biomarker tests.

The lab then encrypts the results (e.g, test and genome) with the user's public key and uploads them to decentralized storage. Only the user's private keys can decrypt these results, and only through user control may the results be reused by another lab.

The goal of having sovereign labs is to increase the availability of products and enable joint products by integrating services from several labs. This also allows DeBio to scale because labs do not need to be centralized, allowing for multiple standalone genetics facilities to participate.

Decentralized Service Request for Customers to Local Labs

A customer that needs a certain service that is not provided by their local labs may submit a service request. Service requests are new testing service proposals by customers; each customer that submits a service request will have to stake their $DBIO token to incentivize a local lab to fulfill the service request.

DeBio Bioinformatics Use Cases

Regarding Bioinformatics, DeBio's services are not limited to genetics testing alone. Non-genetic testing use cases include anonymous medical testing and privacy-first document digitization.

Our services include but are not limited to:

1. Decentralized Genetics

Decentralized genetics allow users to sequence their genomes and retrieve their test results **anonymously**.

2. Biomedical Testing

DeBio enables at-home medical testing so that patients do not need to visit a physical facility. This includes Covid-19 testing and other diseases. All tests are anonymous-first.

3. Electronic Medical Records

DeBio provides services to secure electronic medical records and PHI (personal health information) for use by medical organizations only with the user's consent to protect their privacy. These medical records can even contain large data such as MRIs, radiology images, etc.

KYC and EMR (electronic medical records) are by default delinked from each other within the platform architecture. This means that the patient's identity is not attached to his or her records. Patients are also able to share their EMR data with hospitals while retaining full control over which data to reveal or receive.

DeBio Payment Mechanism

DeBio supports two payment models: Trustless/Decentralized Payments or traditional Enterprise/Consortium Model. This enables users who aren't savvy with decentralized payments to still be able to participate in our platform.

Trustless/Decentralized Payments

Trustless/Decentralized payments all occur via a Blockchain token model. Consumers can onboard with their preferred cryptocurrency token, or use a fiat-to-crypto bridge to submit their payment. Smart contracts then hold the consumer's tokens in escrow until the lab returns the valid data. Only then does the smart contract trigger the fund disbursement from escrow into the lab's account.
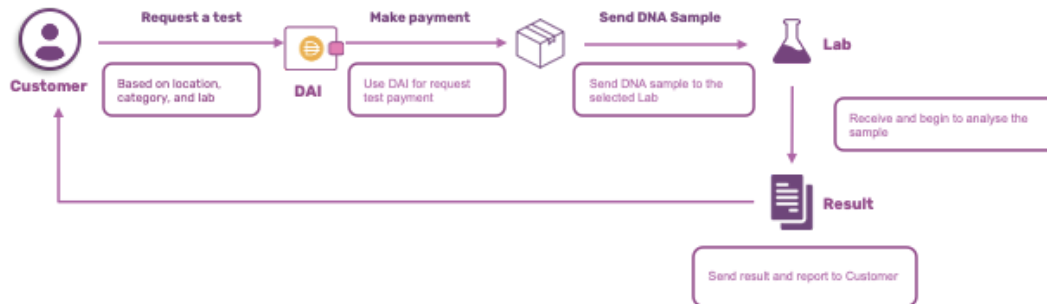
For example, a customer that would want to request a new test will do so through the DeBio Network's web app, the request details will be saved in the blockchain for the labs to see, and the payments will be held in an escrow service. DeBio Network accepts $DAI as payment; the customer will be required to pay for the service before sending the DNA sample to the lab.

After the lab receives the DNA sample, they will begin to analyze the sample and will upload the result and report to the blockchain encrypted using the customer's public key and the lab's private key. The lab will receive the payment after they submit the test results.

Enterprise/Consortium Model

This model uses a traditional payment option:

Consumer funds are held in escrow by a local payment gateway or bank until the lab provides valid data (report and genome) into decentralized storage. The smart contract then triggers the fund disbursement into the lab's accounts.

Note that this still maintains the anonymity of the genomic data, since:

- Payment gateway/bank **does** have access to consumer KYC but **does not** have access to genomic data or reports
- Labs **do not** have access to consumer KYC, although they do have access to anonymized genomic data.

Technical Architecture

"The DeBio Network believes that the future of blockchain lies in the specialization of technology use cases as well as interoperability. The unique demands of the bioinformatics and biomedical ecosystems, the decision-making governance required to ensure proper and transparent data handling, in conjunction with the one-of-a-kind business models we provide, require a fresh, alternative architecture." — Pandu Sastrowardoyo, Initiator of the DeBio Network.

Technologies

The DeBio Network infrastructure is optimized for user anonymity. Other than safeguarding the user's sovereignty from the business logic perspective, the DeBio Network leverages the most recent and innovative technologies available, including but not limited to:

- Substrate
- KILT Protocol
- The Octopus Network
- The InterPlanetary File System (IPFS)
- Ocean Protocol

Substrate

Substrate, the framework behind the Polkadot token, enables developers to build purposeful blockchains. The DeBio Network team chose Substrate because of its capabilities and we intend to connect our parachain to the Octopus Network relay chain. Beyond enabling the DeBio Network to connect the parachain to the existing Octopus Network relay chain, DeBio Network's parachain will also benefit from the security provided by the relay chain.

KILT Protocol

KILT Protocol provides a solution that prevents data or identifiable User behavior from being recorded or concentrated in one entity. Built on the principles of "Privacy by Design," KILT is an open-source blockchain protocol that issues claim-based verifiable, revocable, and anonymous credentials.🔗

KILT allows users to claim arbitrary attributes about themselves, have them attested by trusted entities (Attesters), and then store these claims as self-sovereign Credentials in the form of hashes on the blockchain.

Users can then submit their Credentials with applications and services that use KILT Credentials and trust the corresponding Attesters. These applications or services Verify the Credentials of the User by comparing the hash of the Credentials to the hash on-chain.

Because the Attestor is not involved in the Verification process, the behavior of the User remains unknown to the Attestor. In addition, when showing the Credentials to the Verifier, the Claimer can hide any data that is unnecessary for the service, allowing the Claimer full autonomy over their data. Finally, because the hash cannot be transformed back to the data originally submitted in the user Claim, any hacking efforts by malicious actors are rendered futile.

Octopus Network

The Octopus Network will be used for connecting to public networks, more specifically, to public exchanges. The Octopus Network is an app chain built on the NEAR Protocol 🔗. Both the design and development of the NEAR platform 🔗 are guided by a handful of key principles that solve problems inherent in both centralized and decentralized systems. Those key principles are usability, simplicity, scalability, and sustained decentralization.

The InterPlanetary File System (IPFS)

IPFS is a protocol made for fully decentralized, peer-to-peer data sharing and storage. IPFS uses a content addressing system by hashing the content. Every piece of content that uses the IPFS protocol has a *content identifier* or CID, that is its *hash* 🔗. The hash is unique to the content that it came from.

Ocean Protocol

The DeBio Network team is currently researching the feasibility of the Ocean Protocol. Ocean Protocol is built for the consumption of data assets in a secure, privacy-preserving fashion. Ocean's *Compute-to-Data* 🔗 features provide a means to share one's data while preserving privacy because the data itself never leaves the premises of the owner. Ocean Protocol resolves the tradeoff between the benefits of using private data and the risks of exposing it.

Ocean Protocol has also developed an open-source data marketplace called Ocean Market. Ocean Market is forkable. The DeBio Network Team is researching its potential for use because it's in line with our goals to create a data marketplace for biomedical and genetics research.

Hashicorp Vault

HashiCorp Vault is a secret management tool 🔗 designed to control access to sensitive credentials and data. DeBio chose Vault because of its security and accessibility. HashiCorp Vault can store sensitive environment variables, database credentials, API keys, and more,

giving users control over who has access and who does not. Hashicorp Vault already provides a unified instance to store a multitude of secrets on various Platforms.

ERC20 Smart Contracts

Our main payment option is Escrow. ERC20 Smart Contracts will be used to transact stable coins meant to be used as in-app currencies to purchase services.

NestJS APIs and Workers

The NestJS API is mainly used for non-consensus critical data that is used by the dApp such as lists of countries, regions, and city codes. Data that is non-consensus will not be stored in the blockchain, rather it will be stored inside a Postgresql Database instance.

The NestJS background worker is a service built intentionally to listen and confirm payments from the Ethereum Network — more specifically the Escrow smart contract. After receiving a confirmed payment notification, the payment confirmation is then published through the Substrate pallets.

DeBio also implements a NestJS indexer to continuously listen to update events on the Substrate pallets, mainly to be synchronized with a self-hosted Elasticsearch service to make fluent search algorithms.

Technical Architecture Layers

Our technical architecture consists of four layers, the main blockchain infrastructure, the transport and generic business logic layer, and lastly the top-level business logic layer.
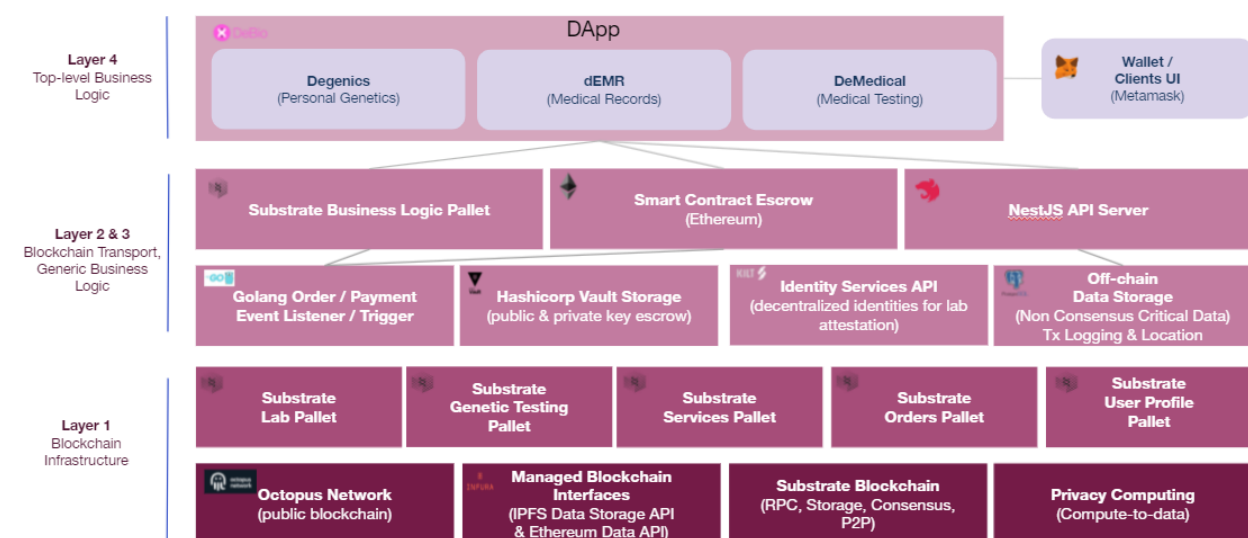
DeBio Proposed Technical Architecture

Layer 1: The Blockchain Infrastructure

For our main blockchain infrastructure, we will be using Octopus Network, Substrate, and IPFS.

Layer 2 & 3: The Transport and Generic Business Logic Layer

The second and third layer contains our transport and generic business logic. This layer is responsible for serving data from the blockchain infrastructure to the users directly.

The Substrate blockchains in the first layer are accessed through the second and third layers. Each pallet contains the base business logic for interactions with our blockchain, thus the users will trigger this business logic from a higher level, more specifically, from the dApp itself.

Layer 4: The Top-Level Business Logic Layer

The fourth layer will be the dApp and Metamask. All transactions with the DeBio Network will be available for Metamask users only for the time being.

Privacy Computing

As one of the primary tenets of the DeBio Network is privacy, DeBio will implement privacy computing concepts within our systems. Privacy computing concepts support privacy preservation with high concurrency and efficiency even for a massive number of users 🔗. Privacy computing will later be performed on many types of lab results including services from Degenics, deMedical, and dEMR.
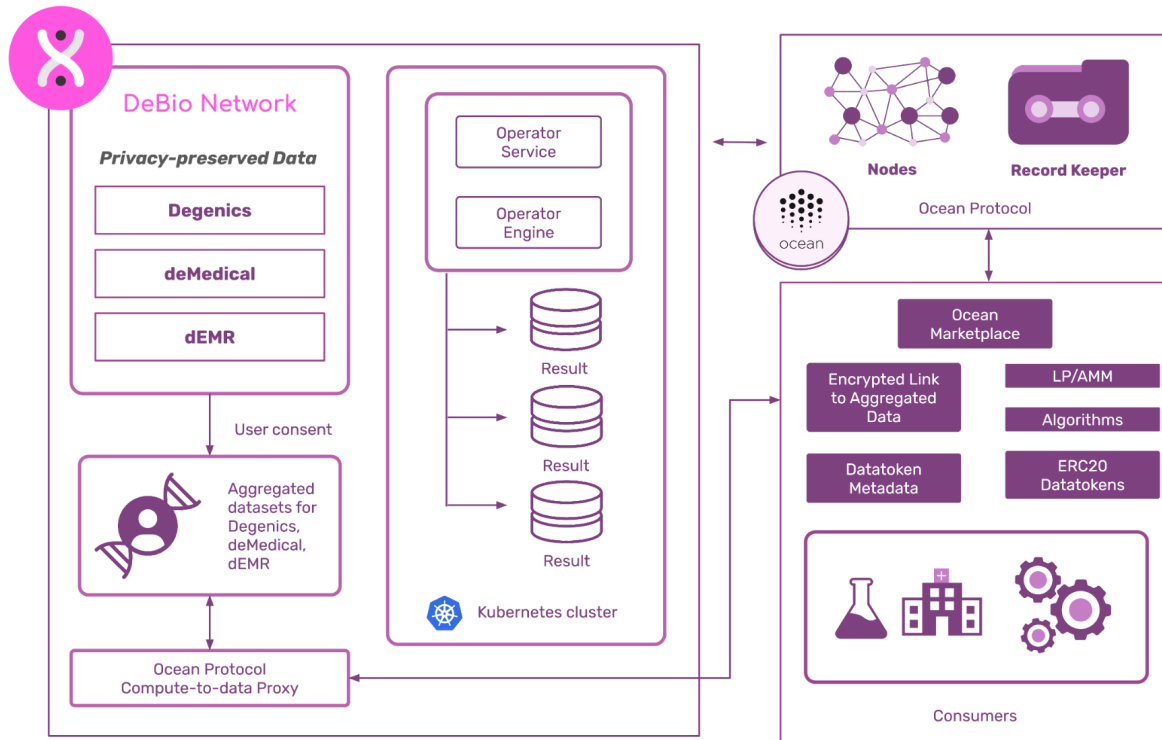
Once users give consent, their aggregated datasets, whether for degenics, deMedical, or dEMR can be sold in the Ocean Protocol through the Compute-to-data proxy.

The idea behind using Ocean Protocol Compute-to-data is to let data stay on-premises yet allow 3rd parties to run specific compute jobs on it to get useful analytics results like averaging or building an AI model.

It is meant to be useful for data sharing in science or technology contexts. It's also meant to be useful for selling private data while preserving privacy. The private data isn't directly sold; rather, specific access to it is sold, access "for computing eyes only" rather than human eyes.

Tokenomics

Before we can discuss the tokenomics of The DeBio Network, we must first discuss the proposed DeBio Decentralized Autonomous Organization (DeBio DAO).

The Decentralized Autonomous Organization

DeBio DAO will be an organization run by its users. DeBio DAO is the platform of the technology. Blocksphere 🔗 is the provider of this technology while DAOgenics is the attester for the labs joining the organization.
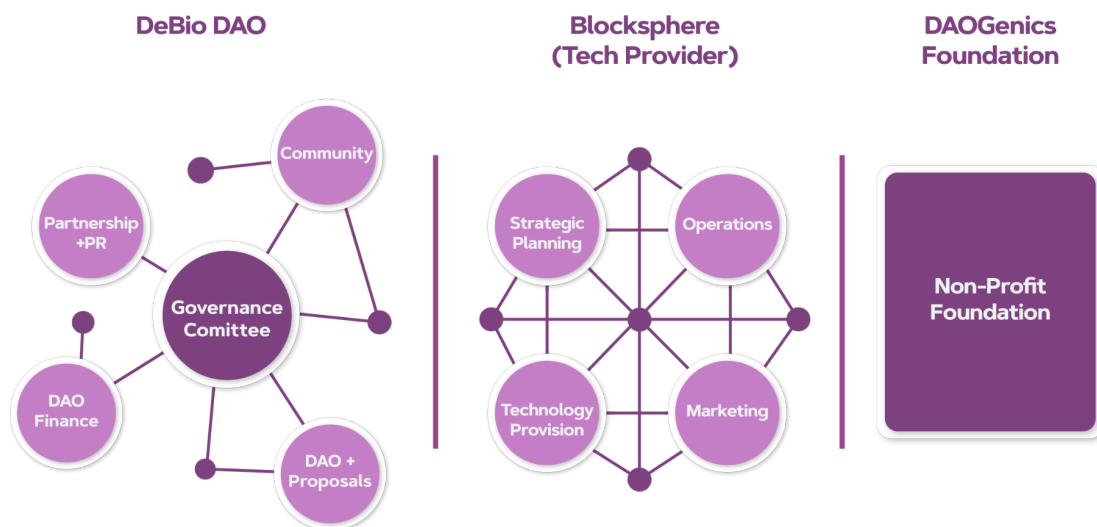
The purpose of having a DAO is to enable a system that both allows the users to vote and executes the results of the vote. While it is possible to create a decentralized system where the results of the vote are executed manually, this can ultimately become a point of weakness. Thus, the system needs to execute the results of the vote to create a truly decentralized system.

While the governance committee will be able to vote on the decentralized organization, the committee will not be too technical. We don't expect the committee to be blockchain experts. So, most of the time the technology provider (Blocksphere) will provide the lead. However, the governance committee can veto the technology provider's decision if they don't see fit.

DAOGenics Foundation

The DAOGenics Foundation is a non-profit foundation that screens incoming labs that wish to join the DeBio Network. DAOGenics Foundation doesn't own the DeBio Network and will only function as an attester to verify each incoming lab.


Any lab who wishes to join the DeBio Network must go through the registration process. The lab will be required to fill in their information, and their certifications along with the proof. All of the information submitted by each lab will be available for everyone to see in the blockchain unencrypted, for full transparency.

Before a lab can submit a verification request to the DAOGenics Foundation, they need to provide a list of services that they will be offering within the DeBio Network platform. It is mandatory for each lab to have at least one service provided out right.

After the verification request has been submitted, the DAOGenics Foundation will start the review and will give the lab a verified status if the data they submit proves to be legitimate.

The Token Model
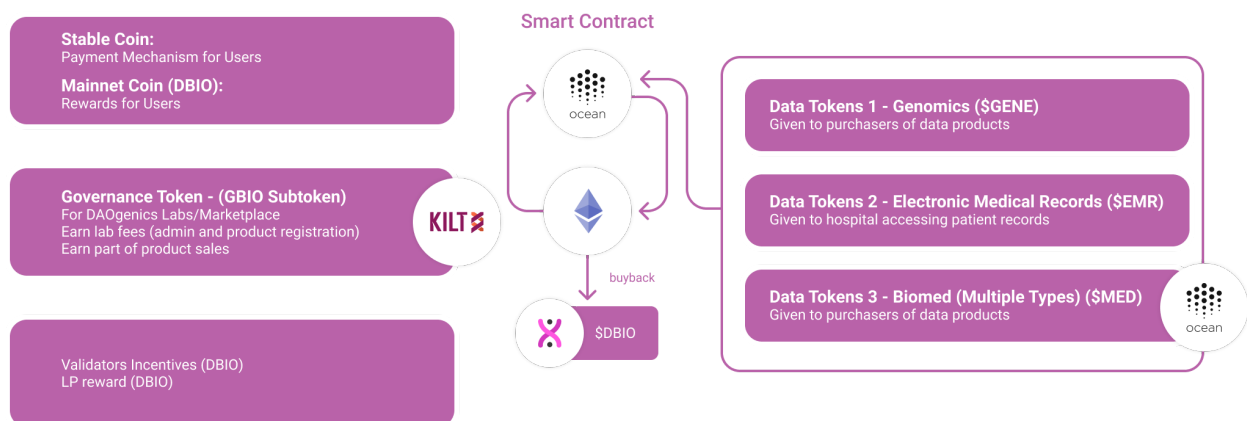
The DeBio Network team intends to release three tokens:

- Mainnet Transaction Rewards & Validator Token ($DBIO)

- The Governance Token ($GBIO)
- The Data Tokens (e.g. $GENE, $MED, and $EMR).

Users will pay for the DeBio services using the $DAI stable coin. Stablecoin can be used to buy Testing Products that will be available in the testing marketplace such as Genomic Testing, Biomedical Testing, and Electronic Medical Records (EMR).
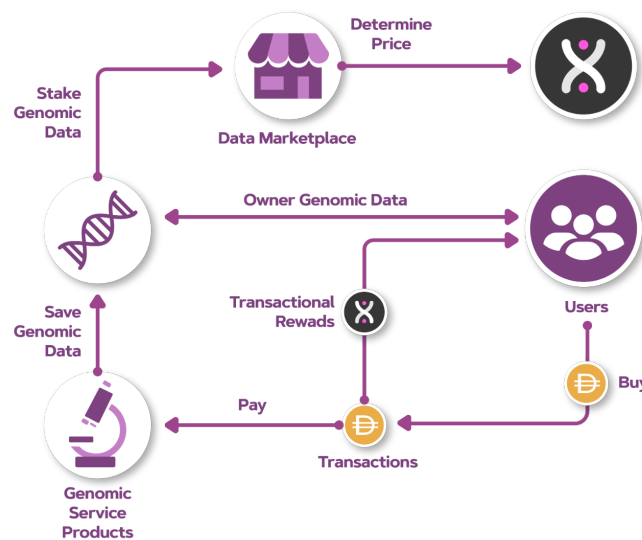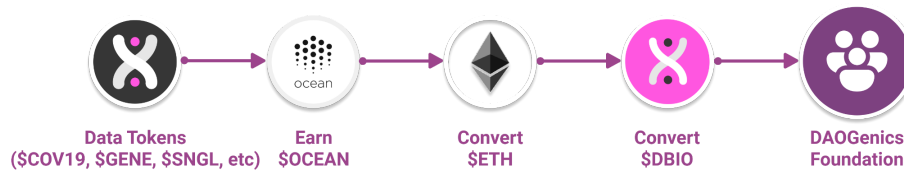

Data made available by Users will be categorized as data tokens (e.g. $GENE, $MED, and $EMR). Data tokens are ERC20 tokens minted in the Ocean Protocol used for accessing the aggregated datasets. The Genomics, Biomedical or EMR data will not be saved inside the ERC20 token employment-based database; instead, it will serve as a pointer to the encrypted link of the corresponding data.

Users who provide their data tokens will have a "data provider" role in the data marketplace. All data buyers in the Ocean data marketplace will do the transaction using $OCEAN. If the transaction is successful, the "data provider" will receive $OCEAN and the data buyer will receive the data token they bought.
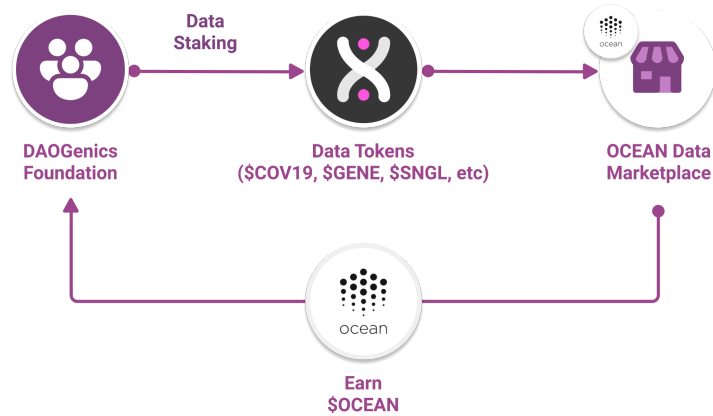
If the data buyer wants to access the encrypted information of the data token, they need to send the data token to the data provider. As a result, the data provider will have both the $OCEAN and data tokens and the data buyer will get the decrypted information of the data token.


Data tokens received by DAOGenics Foundation will be converted into $OCEAN. After a certain period, $OCEAN received by DAOGenics Foundation will be converted into $DBIO through a non-permission smart contract.

As a result, DAOGenics Foundation will always buy back the $DBIO token through a non-permission smart contract based on transaction volume conducted in the data marketplace. More transactions in the data marketplace mean more demand for the $DBIO token.

$DBIO Staking for Service Requests

Customers can request for a service to be added to a local lab near them. Service requests are proposals made by customers that incentivize local labs to provide the requested service. It can be used to notify a lab of a desire in the local community of a certain type of testing.
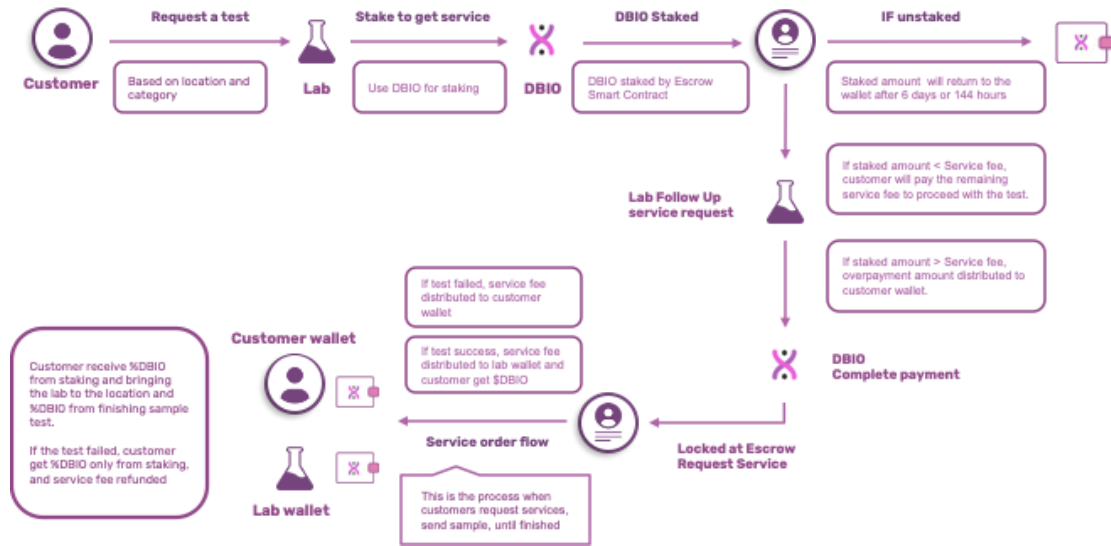
A customer will first have to request a test based on a set of categories, and they will need to provide the region of labs that can accept it. Any other customer that wishes to have the service provided in the selected region can participate by staking their $DBIO tokens. The $DBIO tokens are then put into an escrow, and the customers will only need to wait for a lab to accept them.

Customers who wish to unstake their $DBIO token will receive the exact amount they staked after 6 days or 144 hours.

If a lab follows up with the service request, they will first need to submit a new service in their service catalog. The newly created service will be flagged with "ServiceRequest" to indicate that it is a result of the lab accepting a service request. After accepting the request, the lab and all of the customers who staked their $DBIO will go through the request test flow.

However, the customer would not need to pay the entire service fee for the test, instead, if the staked $DBIO amount is less than the service fee, the customer will have to pay the remaining fee to proceed with the test. If the amount of staked $DBIO exceeds the service fee, the customer will receive the remaining amount of their stake back in their wallets. The service fee will be sent to the lab's wallet only if the test succeeds, otherwise the service fee will be distributed to the customer's wallet.

If the test ends up being successful, the customer will receive a percentage of $DBIO according to the amount they staked.

Token Distribution
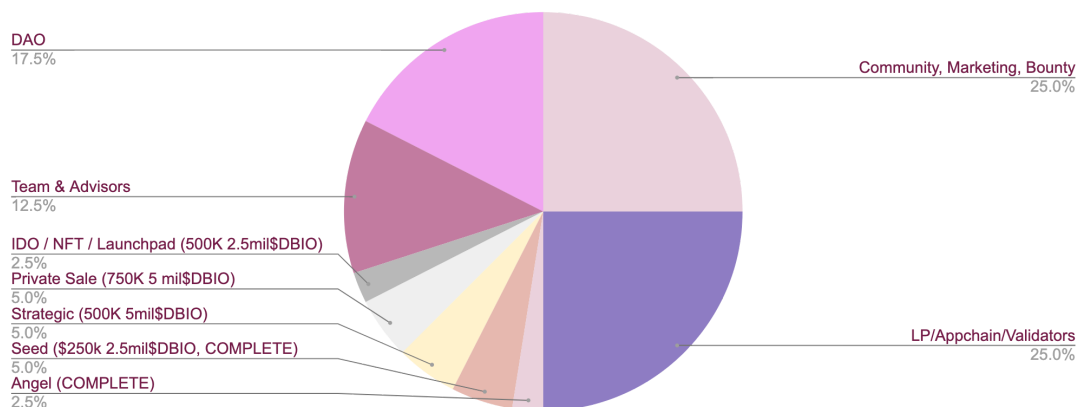
The token distribution will be divided into 5 parties: The community, app chain validators, the DAO, the investors, the DeBio Network team, and the NFT launchpad. Each owning a lesser percentage than the last. Both community and app chain validators will receive a total of 50% of the pie, while the team behind the project will only receive 12.5%.

There are 4 rounds for investments in the DeBio project with a total sum of 17.5%. As of today, the DeBio Network team has finished two investment rounds giving away 7.5% of the stake to both angel and seed investors. The lowest stakeholder of the entire project would be the NFT Launchpad, holding around 2.5% of the total supply.

Mainnet Coin (stable coin, etc)

The Mainnet coin will be backed by a stable coin. We decided to use a stable coin because the Mainnet coin is intended to be used for transactional purposes, or fees for work being done by the corresponding labs. We are intending to use USDT, USDC, and DAI as our stable coin.

Governance Token ($GBIO)

Governance tokens are intentionally made for the labs. Because The DeBio Network is essentially a decentralized organization, the labs would need a token to be used for voting in the DAOGenics marketplace. The Governance Token can also serve as a method for lab onboarding.

The Data Tokens (Genomics, Biomedical, and Electronic Medical Records)

These tokens are used as a method of transaction in the data marketplace. The DeBio Network team intends to research Ocean Protocol as an alternative for this token.

Validator & Transaction Rewards ($DBIO)

The Validator Token is used to incentivize the node owners to validate transactions and protect the dApp from unauthorized users. The intended incentives provided for validators are LP rewards and Governance tokens.

Our Team

The DeBio Network team consists of blockchain and bioinformatics experts who are renowned in their field.

Pandu Sastrowardoyo (Chief Executive Officer)

Ms. Pandu Sastrowardoyo, Initiator of DeBio. *IT & Blockchain consultant and business leader. Former environmental engineer with bioinformatics course certificates and microbiology experience. Ex-IBMer, cofounder of multiple Blockchain organizations, as seen in Forbes, CNBC, CNN, Deutsche Welle, Forkast News, and many others.

Ibnu Gamal Alhadid (Bioinformatics Advisor)

Mr. Ibnu Gamal Alhadid, Bioinformatics Advisor for DeBio. Biologist, fitness professional, and wellness enthusiast. Experienced in network marketing, business development, and sales throughout a wide range of industries. Coordinates with DeBio Network Advisors.

Dr. Agus Mutamakin, M.Sc (Bioinformatics Advisor)

Dr.Mutamakin has 15 years of medical information technology experience as the Chief Information Officer at the National Referral Hospital and as a Health Information Systems Consultant. He is also involved in the Data and Information Compartment of the Indonesian Hospital Association and a member of the Health Informatics Technical Committee of the Indonesian National Standard. He has also been invited as a guest lecturer in several master's degree programs in Hospital Management in Indonesia.

Dr. Hendy Wijaya, M.Biomed (Bioinformatics Advisor)

Dr.Wijaya is a researcher specializing in biochemistry, nutrition, and metabolic diseases. He has researched aging, nutrition, metabolic diseases, and genetics. He regularly lectures and teaches biochemistry and physiology on one of the campuses in Indonesia and is a research consultant for a food supplement company.

Karlia Meitha, Ph.D (Bioinformatics Advisor)

Dr.Meitha is a researcher adept in the field of molecular biology. She has an interest in genome editing and small RNA applications in the pursuit of sustaining life. She regularly writes in the field of plant physiology and molecules. Currently, Dr. Meitha leads a biotechnology master

program aiming to create a generation of biotechnology experts who engage in creative thinking.

Dr.Rer.Nat Marselina Irasonia Tan (Bioinformatics Advisor)

Dr. Tan is a researcher specializing in cell and molecular biology, particularly in the biomedical sciences. She has research experience in the fields of cancer biology, immunology, and whole-genome sequencing. She is currently active as a lecturer and regularly lectures about immunology, cell biology, cancer biology, animal development, and tissue engineering.

Popi Septiani, Ph.D (Bioinformatics Advisor)

Dr. Septiani is a specialist researcher in the field of genomics and bioinformatics. She has extensive experience in genomic data analysis and transcriptomics in the field of medical and agricultural sciences. She has worked in the field of biotechnology for an agricultural science company. She is currently active as a lecturer on subjects regarding molecular genetics and bioinformatics on Indonesia's campuses.

## Dr. Theza Pellondo'u, Sp.KF (Bioinformatics Advisor)

Dr. Pellondo'u has knowledge and experience in the field of medical forensics, medicolegal, and bioethics. He has helped solve several criminal cases, doctor-patient disputes, and ethical problems in both the fields of medicine and education. dr. Pellondo'u was the Chairman of the Ethics and Legal Committee in a private hospital in Jakarta. He is currently active as the Head of Department and lecturer in forensic medicine and medicolegal, and bioethics at a private medical faculty in Jakarta. He also practices as a forensic and medico-legal specialist in the same city.

Dr. Kresna Sucandra (Bioinformatics Advisor)

Dr. Sucandra is an anesthesiologist, intensivist, lecturer at medical school, and co-founder of medical clinics. On the tech side, works as a blockchain development engineer and startup co-founder. Actively contributes to the Polkadot blockchain ecosystem, Bit.Country and Covalent Ambassador program.

Roadmap
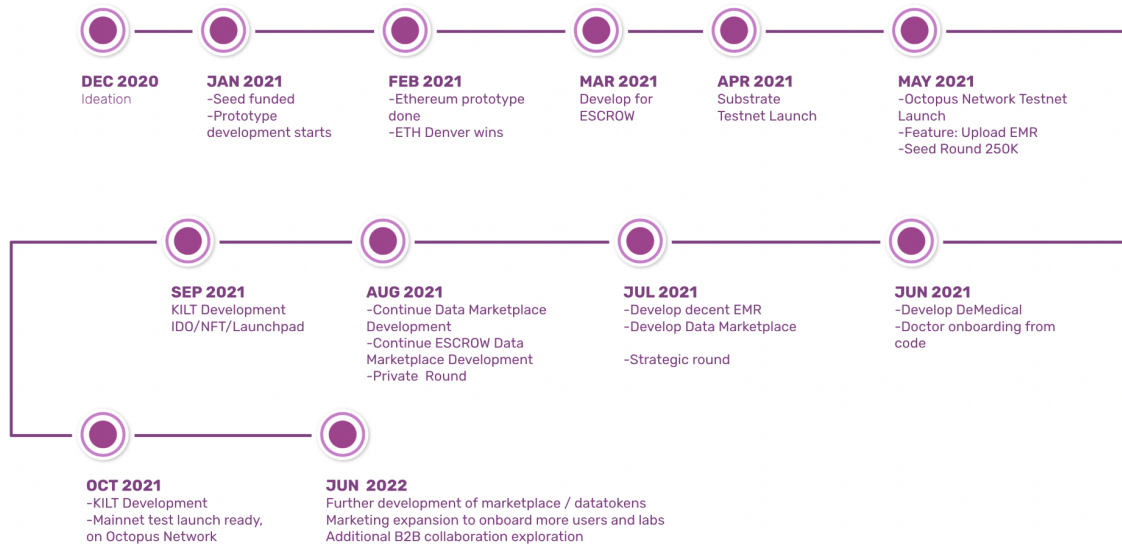
The idea of DeBio was first conceived in December 2020. Development then started at the beginning of January 2021 in parallel with our first seed funding round with friends and family. We continued the development process until the end of February when we entered as a competitor in a hackathon at a leading blockchain conference ETHDenver.

DeBio (previously named Degenics) was named Winner for Best IPFS Use for Identity, and United Nations Sustainable Development Goals (SDG) winner for its fully anonymous DNA testing marketplace.

In March of 2021, we began the research and development of our escrow feature until the end of May when we released our first para chain on the Octopus Network test net. May was also the month we began our second seed round, resulting in an investment of USD 250,000.

In June we started the development of our second product DeMedical. This feature enables users to upload their electronic medical records. We also plan to have our third strategic round followed by our final investment round in August.

The IDO/NFT/Launchpad is planned to be in Sept, and from then on we plan to continue to integrate our services with one of our partners, KILT. Integration of the KILT Protocol is planned to end in October in conjunction with our main net launch on the Octopus Network.

In 2022 we plan to further develop our marketplace. With an expansion to onboard more users and labs. Along with additional B2B collaboration exploration.

Contact Us

We here at the DeBio Network fully understand the concern for user anonymity. Some people might say that our DNA is the most private thing we have 🔗, and we take that very seriously.

If you are interested you can contact us through these channels:

- Telegram DeBio Channel 🔗 (Semi-anonymous, registering for Telegram requires a phone number)
- DeBio Discord Server 🔗 (Semi-anonymous, registering for Discord requires email)

We also have a company website 🔗. To try out our app you can click this 🔗.