Medical 4th Chain

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Medical 4th Chain Team

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Platform for Decentralization of SARS-CoV-2(COVID-19)

DNA Medical Data A.I.

"The world will have to live with Covid 'forever'"

- Stephane Bancel (Moderna CEO)

'Medical A.I' preparing for COVID-20

Ver. 2.1.1

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Agenda

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Abstract

The life-long medical information for the average person amounts to about 1,100 terabytes. The information consists of 60 percent Exogenous Data, 30 percent Genomics Data, and 10 percent Clinical Data. This data grows each year to more than 60 times in a lifetime.

Many people think that the extension of the human life span relies on the development of medical technology and drugs. However, progress should not purely be attributed to the development of medical technology. Rather, it should be seen as the culmination of improvements in social infrastructure such as the improvement of nutritional status due to the spread of economic power and development of public health. The present time is called the Health Care 3.0 era. Health Care 1.0 was the era in which the system first managed the epidemic, 2.0 the era for hospital-oriented care, followed by the 3.0 which was the era of custom personalized Medicine. Now, humanity is developing the era of Healthcare 4.0 - the era of data-driven medicine and healthcare. Medical science should be a discipline with data at its core.

But data-driven development exposes the field to many challenges. In 2015, the cost of health care in the US is over $ 3,205 Billion, which is close to 15% of the US budget. In 2029, the US Medicare and medicaid fund will be depleted. Without action, funding for medical treatment will go into a state of bankruptcy, leading to a complete collapse of public health care. The only way to deal with this is to focus on 'preventing' diseases, not just 'curing' them, and we are convinced that the key to prevention is data, not medical technology.

In particular, the ownership, protection, utilization, and sharing of medical data is becoming more important than anything else. The Medical 4th Chain platform creates an independent Medical Data Platform Ecosystem that operates on a blockchain basis.

People will be able to predict the onset of disease through their DNA data and their own Health Data produced in their daily lives and collected at hospitals. In addition, all participating providers will be able to develop a variety of services based on this data. We are no longer in a world of health care that simply focuses on treating disease. We are confident that Medical 4th Chain will spur a healthcare revolution by creating a new system that utilizes personalized health data.

1. Introduction

Thanks to modern health science and many individuals, the fatality of COVID-19 seems to be rather low. But without these factors, its fatality would have been higher than that of any other disease in history. In particular, there have been many problems reported regarding the side effects of the people that have recovered from the infection. These were not limited to respiratory problems; there have also been various neurologic problems. MPOS Co., Ltd. is planning a research on patients beyond the early process of the acute disease in order to discover the proportion of patients with long-term impacts, by utilizing global technology network for the clinical management of COVID-19 and the data from researchers worldwide and patient groups. The research regarding the length and cause of such impacts will be utilized in developing additional guidelines for patient treatment.

Human health can be measured by a variety of data points. Public health and the healthcare system overall will be greatly improved through collecting, managing, analyzing and sharing the above mentioned Exogenous, Genomic, and Clinical Data. Among them, Medical 4th Chain focuses on disease prevention through human genomic gene test. Of course, genomic genes will also be key to how effectively data is distributed and managed. But this is not possible within the current healthcare system. Collecting health data is drifting away in formalization and informalization and inconsistent regulations of each country. In addition, data that has already been collected is used only by people who have monopolistic or economic power over medical treatments rather than in the public interest. Data must be collected for lawful, safe and public-interest purposes.

In terms of data management, monopolistic control of information by an authorized company, organization, or even a national organization, can seriously damage the integrity of the data. The integrity of data analysis cannot be guaranteed under circumstances in which the data can become corrupted due to poor management. Under these circumstances, sharing of data is also limited. Only data that can be confirmed as legitimate and uncompromised should be shared and used to inform medical decisions. The current state of affairs is also unfair in terms of how there are no direct benefits to the individual who provided the data. The future of a health data marketplace should be an ecosystem that benefits all participants.

Medical 4th Chain will create this transparent and fair market. The goal is to ensure that all health data in the platform is distributed through transparent and legitimate channels. A variety of data will be collected, processed and used by companies and organizations collaborating with Medical 4th Chain. All participants in this process will receive the benefits of their participation in return. The Medical 4th Chain platform and the M4th coin(M4th) which is the crypto currency that will be distributed in the Ecosystem maintain the Medical 4th Chain economy. A variety of participants will also be rewarded for their contributions with M4th. M4th is available for use on all services within the Medical 4th Chain platform. With M4th you can receive DNA Genetic Testing & Analysis, as well as pay medical and drug bills. You can also pay for various IoT (Internet of Things) devices and services provided by DApp producers and service providers within the platform, effectively managing and selling your own data. Consumers will be able to manage all health data within the Medical 4th Chain platform from the very beginning. Additionally, the development tools provided by Medical 4th Chain will allow providers of medical services to build services freely within the platform and ecosystem.

It is said that Healthcare 3.0 is characterized by the value of sharing IT and medical information to advise care. But it is useless if you cannot share information properly. What would happen if we

used a blockchain – technology that is at the core of the new industrial revolution? The key to a successful healthcare blockchain is to focus not only on the collection and analysis of data but also on the larger goal of ubiquitous and indiscriminate data-sharing. This is why reliability and security are important. We believe that the health data collected using our blockchain will lead to breakthroughs in the study of human disease and its prevention. Everyone wants to know the details of their own genetic predisposition towards certain diseases. Many patients also strive to learn about treatment options and determine which treatment methods are right for them. This will be possible if we are able to utilize the vast amount of reliable data that humans inherently own. The expansion of our medical blockchain will bring a new paradigm to the healthcare industry itself. Blockchain ensure data integrity by transparently managing all information that can be digitized. The future of healthcare is one that connects the industry with this data through proof of ownership and transparent distribution of economic benefits, and Medical 4th Chain will usher in this new era of Healthcare 4.0. Medical 4th Chain provides a data trading market with a foundational focus on consumers as well as resources and incentives for health care providers, service providers, research groups, companies, and public organizations. We will achieve a true Healthcare 4.0 world through data innovation that reproduces, interprets and distributes health data.

2. COVID-19, Human DNA and Medical Data

The unusual virus discovered in Wuhan, China in the winter of 2019 began as a case of mass infection of a “viral pneumonia.” Following that, it revealed to be a new type of coronavirus called the new SARS-CoV-2, and it was distinctive in that the infection rate was higher than that of any other virus. Common symptoms included fever, dry cough, fatigue, etc., and these symptoms were more severe than that of regular SARS. Among those with symptoms, most (approximately 80%) recover from the disease without medical treatment from the hospital. However, approximately 15% are at the state of serious illness, 5% are unable to recover without an external oxygen supplier, and about 5% end up dying. Most complications that lead to death include respiratory failure, adult respiratory distress syndrome (ARDS), septicemia, septic shock, thromboembolism, and multi-organ failure including damage of the heart, liver, or kidney, and the mortality rate is higher than that of any other viral infection and more severe than cases with symptoms of serious illness. In particular, the mortality rate of patients at least in their 60’s with high blood pressure, heart disease, lung disease, cancer, etc. is at least 300% greater. The harsh reality is that at least approximately 30% of recovered patients suffer from severe side effects including recurrence, hypoesthesia, etc. It is the nature of COVID-19 that anyone with symptoms should be tested constantly as much as possible. As there can be an infection without symptoms, or close contact with a possibly infected person, anyone waiting for test results should be quarantined.

2.1 The Severity and Problems of COVID-19

The reason that COVID-19 is severe lies within the speed at which the infection is spreading. Its infection speed is by far higher than that of any other virus. According to studies, a single cell can be infected with a single virus. Within one year, approximately 100 million patients and 2 million deaths incurred from COVID-19. However, such statistics are limited to countries with access to tests by collecting specimen; reports show that the actual numbers are at least double these.

2.2 High Possibility of a Mutation

The possibility of mutation for COVID-19 is so high that it is not an overstatement to say that a mutation has already begun. Analyses show that the destructive power of the new mutant virus that began in Europe will be much greater than that of the initial COVID-19. There is no way to artificially prevent such mutant virus. Because of the nature of the virus, it is also highly unlikely that a vaccine or medicine will be introduced.

2.3 The Imperfections of Testing

Currently, COVID-19 is diagnosed using two methods of testing. One of them is a PCR-based, gene comparison testing method, and the other is a rapid kit that is based on antigens and antibodies. The polymerase chain reaction (PCR) mentioned previously involves collecting material from the inside of the nose and larynx of the person being tested, transporting it to a gene laboratory where the testing is available, and detecting the COVID-19 virus after cultivation. This method usually has an accuracy of at least 99% excluding exceptional cases. However, the costs are high that in the event that the global population tests at least once, the expenses are excessively high.

In the case of the rapid diagnostic test (RDT), the material collected instantly can be made to react with the initial COVID-19 virus to get instant results. While the assay is quick, the accuracy does not exceed 80%. The cost is also 10 times lower. Therefore, it is available at developing and underdeveloped countries.

2.4 The Limitations of Vaccines and Medicines

The significance of a vaccine was relatively low during the early days following the outbreak of COVID-19. That is because an optimized medicine for COVID-19 among the various medicines was expected to be found. But that prediction was far off. Countries used various anti-viruses, new plasma-medicines, cocktail therapies by mixing existing medicines, etc. but none were effective. At the current state, the focus is on allopathy and early treatment in response to various symptoms, with the lack of a fundamental medicine. Such circumstances, as a result, have caused risking the life of humanity on a vaccine.

While various vaccines are being developed in the United States and Europe, the renowned ones are Moderna's "mRNA-1274," Pfizer's "BNT162b2," which produces immunoprotein through mRNA, and AstraZeneca's "AZD122," which produces the classic antibodies through the virus vector method. Several other countries are reporting the research, development, and production of vaccines, but

their effects have not been verified at all. The 3 vaccines mentioned previously cannot be regarded as having been verified as well. Only clinical tests that were rushed and not systematic were carried on, and the benefits or catastrophes of such results on humanity are unknown. As of this point in January 2021, several countries have begun vaccination, and as expected, various side effects are being found.

2.4 The Significance of Testing for COVID-19

It is hard to say that there is a solution that can solve the current COVID-19 situation. There will be various mutations discovered, and following that medicines or vaccines need to be effectively verified and used, but all of that is impossible within a short period. The only way is to form a natural herd immunity by means of a vaccine, medicine, or self-healing ability of humans. In that case, there is an inevitable requirement, and that is testing for COVID-19. There is no other route for everyone other than testing for diagnosis every time they experience symptoms. Another fundamental research task is securing the data of infected patients regarding the infection. The biggest long-term problem of COVID-19 is the various forms of mutant viruses. Herd immunity is undoubtedly crucial at a time with the lack of a proper medicine or definite vaccine, but the upcoming mutant viruses is another issue and can be a more severe catastrophe.

With the completion of the Human Genome Project (HGP) in 2003, people hoped that their medical care could be customized according to their genomic characteristics. It is generally said that more than 40 percent of patients do not properly receive the full effects of prescription drugs. The completion of the human genome will result in the development of treatments and treatment methods utilizing biomarkers that are compatible with the genetic characteristics of the individual. As we will discuss further below, many people are currently predicting their diseases through DNA Genetic Testing & Analysis and actively receiving preventive care based on their findings. DNA testing & Analysis data will converge with IT technology to develop personalized medical care. In the future, there will be a large volume of genetic information generated by these various services. As a result, specialized systems for managing, analyzing, and mediating these data will be required. A current issue with health data management is that data is often illegally used or altered as soon as it is released. In addition, there is data that can be unclear about the origin or suspicious of its purity. Therefore, these health data should be used and shared purely for the health of more humans.

3. Medical 4th A.I. & COVID-19

Medical 4th Chain is investing and operating in various medical research laboratories. Among these is the COVID-19 testing kit development laboratory. While this will be explained in detail later, the two forms of testing for COVID-19 can be used according to their accuracies and costs, most developing countries to not have access to testing at all. In the case of PCR method, which is high in both cost and accuracy, requires a separate laboratory; even with the facilities and equipment, operation is extremely difficult for most developing countries.

On the other hand, in the case of the rapid kit, while results are provided instantly, there is a huge difference in terms of accuracy. Currently, Korea's technology regarding COVID-19 testing is top tier

globally. In the case of developed countries, (USA, Europe, etc.) only the PCR test is being exported, while the rapid kit is being exported to various developing and underdeveloped countries.

However, the implementing agencies of COVID-19 have a certain trait; most of them cannot do both tests. While agencies that developed the existing viral influenza kit have the rapid kit that can be produced easily with antigens and antibodies, in the case of PCR, the developing environment is entirely new. Therefore, it is rare for an agency to execute both tests. But MPOS Co., Ltd. is one of the few agencies worldwide that have access to both tests. The investment cooperation laboratory of MPOS Co., Ltd. is an agency specialized in human gene diagnosis, and it is developing technology related to various drugs and genes.

Following the outbreak of COVID-19, the government of each country searched for testing methods that can diagnose COVID-19 through various routes and went beyond the traditional method to discover the PCR-based molecular diagnosis testing method, which is the most accurate. However, the testing method for COVID-19 was highly time-consuming and costly, and various bio businesses rushed to develop testing methods. Korea was one of the first countries to develop and distribute testing methods. MPOS Co., Ltd., with the prediction that along with PCR, the rapid kit will be used for the global population to ultimately test constantly, has completed research and development. However, it has not been commercialized yet. MPOS Co., Ltd. is preparing a diagnosis kit that is suitable for the new mutant virus in the mutated form of COVID-19, which is highly expectable (in fact, the general opinion is that it has already begun).

4. Human DNA Test

It is fantastic to know your future (and the disease) through DNA Genetic Testing & Analysis. Angelina Jolie, the famous Hollywood actress, is one of the people who chose to learn about and use their genomic data. In 2013, in her article "My Medical Choice" in the New York Times, Jolie discusses how she analyzed her BRCA gene sequence and found that she had 87% chance of getting breast cancer and 50% chance of getting ovarian cancer. In the end, Jolie decided to remove her breast tissue, ovaries and fallopian tubes as well. In 2014, the U.S. government forced insurance companies to pay for BRCA1 (The Breast Cancer 1) Genetic Testing & Analysis costs for all women identified as having certain risks. With DNA Genetic Testing & Analysis, more than 30% of women like Jolie conditions in the US are preemptively breast-resecting and the rest are performing more aggressive follow-up tests. The test by the Broad Institute for Steve Jobs found a genetic mutation in his cancer before his death in 2010. Unfortunately, no medicine could repair his mutant gene. Foundation Medicine analyzes the genetic makeup of more than 300 types of cancer cells through genetic testing of cancer patients. It also provides consumers with a genetic mutation that has a treatable medicine. The service costs thousands of dollars and is overflowing with customers. The most famous Direct-to-Consumer Genomics Testing Company currently is '23ANDME'. In November 2007, 23andme provided 14 different genetic variation information using saliva for $999, which is currently available in $99 with drug interaction and disease vulnerability information. With 0.1% DNA information, people can get a risk signal for a particular disease in advance, and they can make at least preparations for it. However, in November 2013, the company was in crisis. The attacker was none other than a regulation. FDA believes that it is dangerous for a company to deliver personalized DNA information directly to consumers. Companies, doctors, and governments who know the future value of DNA Genetic Testing

& Analysis are fighting fiercely over the options and risks of personal information. You may have noticed that lobbying of US medical interest (health care interest) groups has worked. This has brought a lot of controversy and consumers and the media have seen it is unfair. Currently, the FDA is showing flexibility in granting some licenses to certain items such as Alzheimer's.

One of the M4th's final goals is to conduct free DNA tests for everyone in the world. Its costs will be covered by the revenue from leasing this information on the DNA Data Exchange Market to be operated by M4th. Early M4th holders are given some of their DNA tests completely free. Personal Genetic / Genome Service (PGS) cannot be excluded from the health market. However, if you look closely at 23andme, the world biggest DNA Genetic Testing & Analysis company, you can see how consumers are being treated. 23andme advises you to "donate" your DNA data. Surprisingly, over 80% of customers are willing to "donate" to these proposals. 23andme received $ 300,000,000 in 2018 from GSK in return for using the genes of their customers for four years. In addition, they have received more than billions of dollars investment in this way. What does that mean for the customer? If they choose to donate, they receive is a slight test fee discount. Does that mean that the customer gets less than a few dollars for DNA data? Additionally, this kind of consumer genome diagnosis service is often limited to those of European ancestry only.

Tests of typical breast cancer and ovarian cancer gene variations show a 90% chance of certain genes being found in breast cancer and ovarian cancer patients of European ancestry, while the probability of finding them in other race groups is 0.1 %. This means that DNA Genetic Testing & Analysis in Asia, which accounts for the vast majority of the world population, is still in its infancy. Among the human genes, the true genome (Exome) is about 1% in total. The total cost of analysis of the human genome sequence in 2003 was $30,000,000,000, down to $1,000,000 in 2004. It costs thousands of dollars as of 2018. Over the past 14 years, the cost of analyzing human genetic sequences has dropped dramatically, while medical costs have risen by more than 20 percent over the same period. This is evidence that the market for basic sequence analysis has not yet begun. If DNA Genetic Testing & Analysis is generalized, the most effective area will be the treatment for rare or chronic diseases that require sensitive management. However, for these results, a large amount of DNA data should be studied. This is a very dangerous piece of information and it is also a matter of commercializing the human being itself. It is clear that DNA will be the basis for human health measures in the future.

As mentioned earlier, there are now close to 10 million people who are undergoing some kind of DNA testing informally. Of course, this number is centered on upper middle class people of European ancestry, living in Europe or North America 60 percent of the world's population exists in Asia. Most disease information from DNA Genetic Testing & Analysis is also for European-centric data.

DNA Genetic Testing & Analysis is not helping people much more than we expected. This is of course due to the lack of data for classification analysis. Asian countries like Japan and China want to boost gene therapy and testing, but there is no data. We also know it's good for health, but we don't know how, where and how much it can be used for. In terms of industry expansion, the core of DNA healthcare is data. Information protection is a serious consideration, too. The leakage of patient information from the National Health Service (NHS) in 2016 demonstrates the abuse of data. In addition, despite the large number of problems, the NHS has provided 3.6 million of medical information to Deep Mind. This clearly shows that advances in technology should not cause another problem and the blockchain will solve this fundamental problem.

5. Pet DNA Test Health care

Gene Diagnosis of Pets (CELL PET)

Dogs and cats are exposed to various diseases. As opposed to humans, they do not have regular medical checkups and cannot speak about the pain they experience; the average lifespan of old dogs and cats are shortened dramatically. And as medical pre-examinations are very costly, while many owners worry about the health of their pets, measures are taken only after the outbreak of a disease, resulting in pain both for the pets and owners.

Over the past few years, there has been a great progress in predicting diseases though human gene diagnosis. However, as of pets, there has not been such great interest in the field. CELL PET is a comprehensive health examination program through genes, the environment, existing microorganisms, and pathogens, etc. in which JENNER Bio Science spent at least 7 years researching and developing.

Such disease prediction through gene and microorganism diagnosis is also possible for pets. There are various microorganisms and pathogens that are unique to dogs and cats. Among them, approximately 10 types of microorganisms, viruses, pathogens can develop into fatal diseases depending on the genetic characteristics of the pets.

In the case of dogs, approximately 40 types of diseases can be predicted according to their genetic characteristics: brain diseases including brain tumors, Alzheimer's, etc., lifestyle diseases including high blood pressure, diabetes, etc., heart and vascular diseases including myocardial infarction, arteriosclerosis, etc., female hormone diseases including premature birth, pregnancy toxemia, intramammary infection, septicemia, etc., oral diseases including arteriosclerosis, oral bacterial infection, halitosis, etc.

An analysis, research company specializing in genes, JENNER Bio Science has been providing "CELL PET," a health examination program specialized for pet genes, since 2018. "CELL PET," has made it possible to perform inspections that have only been able to be carried out in animal hospitals through microbial tests on pet dogs and cats using data accumulated over the past 7 years from continuous research. The cost of inspection would normally exceed hundreds of thousands of won, and it also carries a risk as it often requires anesthesia for children.

Prepared for approximately two years, "CELL PET 1.5" is a newly developed product that allows owners to easily collect genes and microorganisms at their homes. Owners will use the specimen kit provided by the company to collect specimen by rubbing on the gum of their pets. In this process, pets that are used to brushing their teeth will allow their owners to collect specimen easily. The owners will then send it to the gene diagnosis laboratory of JENNER Bio Science.

The gene diagnosis laboratory can predict approximately 50 types of diseases by comparing the microorganisms existing in the bodies of pets and their genetic characteristics. This data is from quantitative analysis, providing the most accurate information among the animal health examination systems available to this day. For example, you own a five-year-old Maltese. Your pet revealed to have

many microorganisms called “Treponema denticola.” You can discover that these microorganisms have a strong effect on the genetic characteristics of your pet, causing your pet to be vulnerable to vascular and heart diseases including obesity, myocardial infarction, high blood pressure, arteriosclerosis, etc.

Many genes and microorganisms also affect the oral cavities of pets. The oral health of dogs and cats is at the core of their general health. The possibility that the oral microorganisms and viruses directly lead to diseases is very high. “CELL PET” provides a solution that can specifically improve the oral environment by testing oral organisms, along with disease prediction.

Humans, dogs, and cats are very different in structure, and in the case of pets, the types, generators, testing methods, treatment methods, and other research of their diseases is still at a very early stage. For example, testing for diseases with the blood and urine samples of animals is based on testing with that of humans. While the results can resemble that of humans, the impact on humans can be very different. For example, while the microorganism Porphyromonas gingivalis is malignant to humans, the possibility of its influence on animals is very low. Likewise, there are several animal health checkup programs that are yet to be verified, the data that they are based on is very weak.

“CELL PET 1.5” is able to analyze various diseases very accurately by analyzing genes, microorganisms, and pathogens together. Also, “CELL PET 2.0,” in preparation, examines skin genes to predict various genetic and environmental skin diseases including atopy, which is currently a major issue.

In the case of three to four companies in Korea and abroad that currently provide animal gene diagnosis, the testing costs are at least USD 500 on average. Predicting three to four disease markers through blood sample tests, urologic diagnosis through urine sample tests, etc. are also very costly at animal hospitals, and testing by the owners result in very low accuracy.

“CELL PET 1.5” is a testing kit in which the owners test for themselves. The test is an amalgamation of gene diagnosis, microorganism diagnosis, virus and pathogen diagnosis, and oral bacteria diagnosis, enabling the prediction of 30 to 80 kinds of diseases according to its type. When you sign up for “CELL PET 1.5,” you will receive a testing kit that consists of cotton swabs and a preserving solution. After using a cotton swab to rub off the part in which the gum and teeth meet in the right upper jaw of your pet, you will place it in the preserving solution and send to the laboratory. Results will be available from two days to a maximum of 10 days.

In the event that collecting specimen is difficult, a “CELL PET 1.5” exclusive animal hospital in agreement with the company can collect specimen for you. There can be additional costs for this process. These cooperative animal hospitals are located in each large city, and owners who brush the teeth of their pets on a regular basis will easily collect specimen.

The results provided by “CELL PET 1.5” testing gives you access to a lot of information. There is a continuous increase of diseases that are caused by genetic effects. However, genetic effects are not absolute. For example, even if the genetic map shows that there is a high possibility of lung cancer, the difference of the possibility of a disease with environmental causes is huge.

For pets, the prediction of disease types depends on their existing microorganism, bacteria, and pathogens, in addition to their genetic culture. That is why one or two tests including gene diagnosis, blood sample tests, urine sample tests, etc. simply based on humans can only simply show current conditions of the pets and cannot prevent the possibility of a disease. “CELL PET 1.5” has overcome such limitations to provide current conditions and even predict future diseases through quantitative analysis.

Owners have access to various solutions through the result report of “CELL PET 1.5” health examination. For example, if there is a strong prediction for a specific disease and the cause is a microorganism, health conditions can be improved by removing the microorganism through medical treatment. If your pet is in serious condition, you can receive a solution and interpretation of results at a cooperative hospital that can analyze “CELL PET 1.5.” Following that, your pet can maintain optimal conditions through consistent awareness and regular examination.

In addition to “CELL PET 1.5,” “CELL PET 2.0” allows you to check the skin of your pet. To be included after the mid-phase of 2021, it will diagnose and predict chronic skin diseases of dogs and cats, which is currently a growing issue, through gene and biological diagnosis and determine treatment according to results or provide a solution to prevent diseases.

This “CELL PET 1.5” test is expected cost approximately around KRW 50,000 and KRW 80,000. As mentioned previously, a simple pet examination program does exist. But visiting the vet will cost at least hundreds of thousands of Korean won. It costs at least KRW 500,000 for a gene diagnosis or microorganism diagnosis. As “CELL PET 1.5” has the same effect of marker testing (tumor, etc.) through a urine sample test and blood sample test, its health examination program provides results, solutions for prevention, and treatment methods worth millions of Korean won through mere tens of thousands of Korean won. Owners also have access to consistent health care through regular “CELL PET 1.5” health examination. In the event that the owners wish to test every 6 to 12 months, they can manage the health of their pets at lower testing costs.

6. Free DNA Genetic Testing & Analysis

6.1. M4th Ecosystem dreams of a disease free world

The Medical 4th Chain creates an ecosystem where many people donate their DNA Genetic Testing & Analysis results in return for the performance of various levels of DNA Genetic Testing & Analysis. M4th plans to provide various levels of free DNA Genetic Testing & Analysis which is initiation and basis of disease prevention. (detailed plan will be released after TGE). DNA Genetic Testing & Analysis is provided even if you only keep M4th coins for a certain period of time. Of course, you can also get a variety of health care services besides DNA Genetic Testing & Analysis. The foundation is based on DNA Data Market armed with strong blockchain-based privacy and integrity.

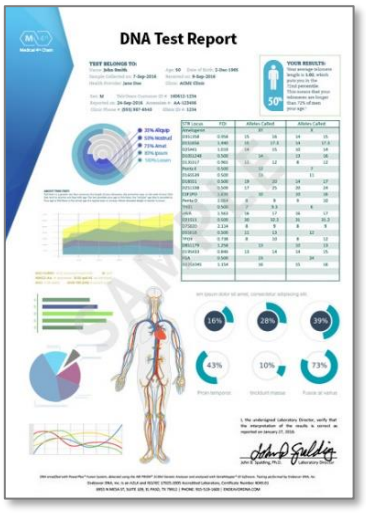
6.2. DNA Data Exchange Market

Anyone can trade their Health Data. It is safest to trade personalized DNA, health and medical data through a blockchain. With the smart contract of blockchain, participants are informed of how specific data is secured, which company is using data and how much they can earn. Customers can safely trade their data and use the M4P in return for hospital care or various healthcare services and IoT devices. The exchange, a form of the P2C market, will be used in a variety of fields. One of the most important factors, privacy, is also solved using a blockchain. Companies that need data offer a reasonable price and each data owner can rent or share the data immediately if they like the price or service. Of course, the ownership of Data is always in the hands of each subject. Various data from Health blockchain Service that is currently in service or scheduled on the blockchain is also available for trade.

7. HP (Health Point) = DNA Free Test Ticket

Medical 4th Chain will publish the Ethereum-based ERC20 protocol coin M4th and establish an independent Ecosystem through the MainNet in the future. M4th is used as the basis for platform trading. Separate Health Point (HP) based on current coin inflation will be created and used. In other words, participants can have HP to perform their own DNA testing and analysis, pay medical, drug costs and insurance fees.

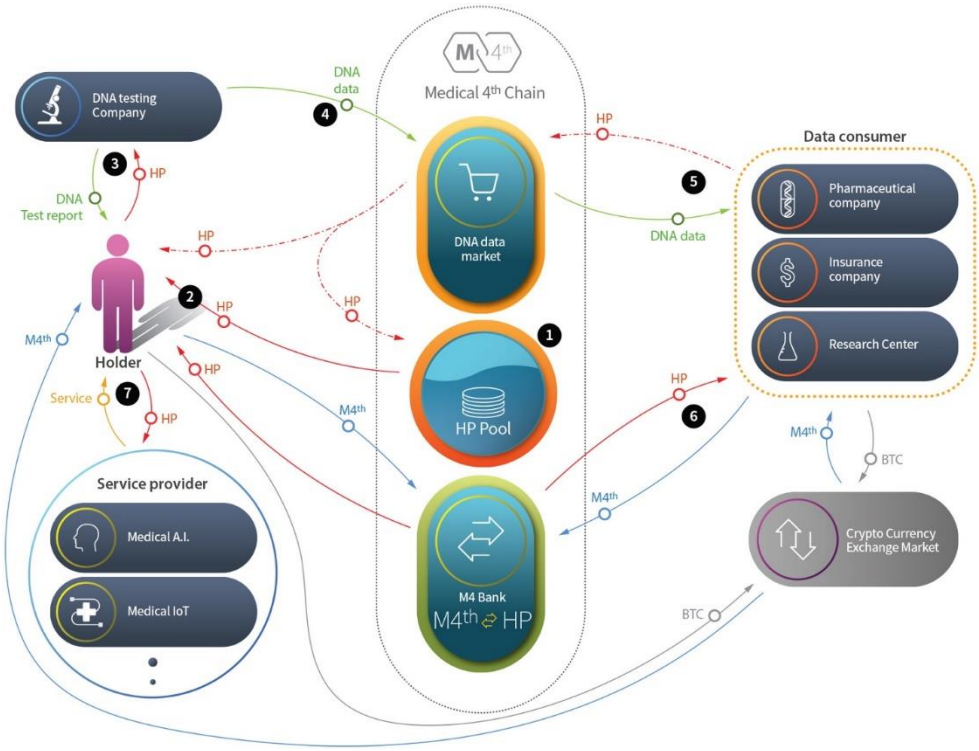
The acquisition method of HP points can be divided into three ways. First, you can purchase a generic M4th and exchange it for the appropriate HP. Second, you can sell or lease your own data and get an M4P from that institution. Third, if you have M4th, you can receive the HP free of charge according to the retention period and amount of M4th. Institutions such as medical institutions, insurance companies, research institutes, etc. need to use M4P to obtain the necessary data and receive a separate M4P from the consumer and use or cash it back in the Ecosystem.



The final target value for M4th is US $1. Having initial M4th would result in more HP being allocated according to future plans. All transactions will be subject to a reasonable percentage of the transaction fee. In addition, when a business or group becomes involved in a transaction, a certain percentage of R&D costs will be separately charged and used to support the DApp.

The M4th team will conduct a DApp hackathon periodically for various DApp services. Through this project, we will find and support development teams with good abilities and ideas. This will take at least 10% of the M4th funding. In addition, M4th holders will get free DNA testing services held by M4th, which will include those who need DNA testing but do not receive for various reasons. This test helps many newborns by predicting and managing diseases that are highly likely to develop.

8. M4th Decentralized DNA Market Ecosystem



① *HP Pool : Fill some of the TGE funds with SEED. Here, early TGE participants are provided with HP to be used for DNA Genetic Testing & Analysis. HP POOL will then periodically provide HP for DNA Genetic Testing & Analysis and Healthcare Service to holders with a certain amount of M4th coins for a period of time. The M4th Holder is available free of charge for various DNA Genetic Testing & Analysis even retaining M4th. HP POOL provides DNA data that has received DNA Genetic Testing & Analysis to businesses or research organizations, receives the consideration back to HP, and distributes the rest to the holders.*

② *M4th holders can receive HP if they meet certain conditions (M4th holding capacity, retention period).*

③ *HP, provided by TGE participants, is the amount that can be tested at the DNA Genetic Testing & Analysis Middle Level in the M4th service. Details will be announced after the TGE.*

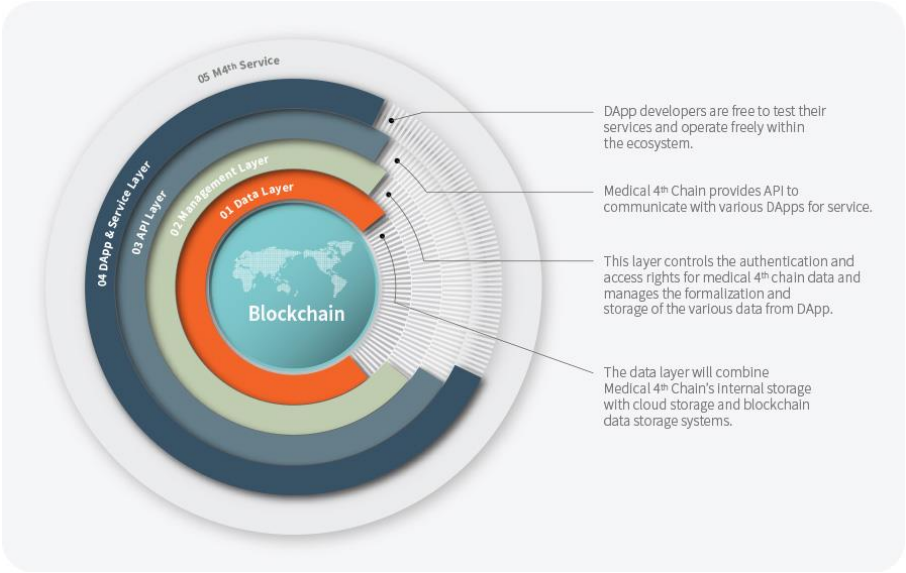
④ *DNA data from M4th holders is stored in blockchain through classification and displayed in the DNA Data Market. Of course, the privacy identification code of DNA data providers is removed, and holders can check their Data Sell History and more in their apps.*

⑤ *Formalized DNA data is sold to companies, research institutes. Transactions are made transparent by recording on the block chain ledger. The price is determined by auction, consultation, lease, etc.*

⑥ *M4th Bank is an internal exchange office that deals with M4th and HP. It is a bank to fix the value of HP, and the exchange rate is determined in real time by calculating the M4th price of several specific exchanges.*

⑦ *You can create and service various DAPP's using the SDK and API provided by Medical 4th Chain. To this end, Medical 4th Chain will regularly hold the largest Medical Hackathon to collaborate.*

9. Medical 4th A.I. Structure



1 Data Layer

The Data Layer is the basic area where data from Medical 4th Chain being stored. The blockchain will store only the minimum amount of data necessary to identify the data points, while the remaining data is encrypted to ensure the integrity of the data then duplicated in storage. The data layer will combine Medical 4th Chain's internal storage with cloud storage and blockchain data storage systems.

2 Management Layer

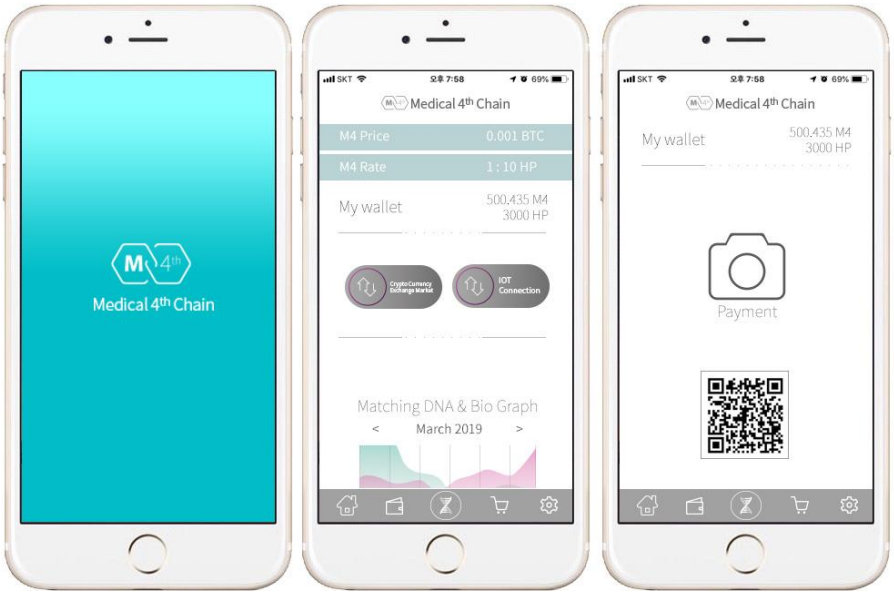
This layer controls the authentication and access rights for medical 4th chain data and manages the formalization and storage of the various data from DApp.

3 API Layer

Medical 4th Chain provides API to communicate with various DApps for service. Medical 4th Chain produces and distributes various development tools for DApp service providers. SDK will be provided as rudimentary tools that can be easily developed by anyone, while professional developers can use various APIs or also produce their own. The API and SDK provided for medical service providers can easily import Medical 4th Chain data. Medical 4th Chain supports development education using SDK in various classes.

4 DApp & Service Layer

This is the layer of Medical 4th Chain where the actual service is performed. DApp developers are free to test their services and operate freely within the ecosystem.



In the M4th DApp, user can see the current health status, DNA test result and DNA test level with HP.

10. New challenge Medical A.I.

In 2017, Google brought a major incident between humans and machines. Google's Deep Learning A.I. AlphaGo beat Lee Se-Dol, the world's best Go player. Lee Se-Dol won one round, but no one doubts that that round will be the last one that human will win. The number of Go moves is about 10 to the 171 th power. It is said that the total number of atoms in the universe is about 10 to the 80th power, so AlphaGo has already the capacity to analyze all the atoms in the universe. So let's put this into human disease. This is the beginning of the fact that medical care is the study of data. This is the beginning of Medical A.I. The key is to secure relevant data.

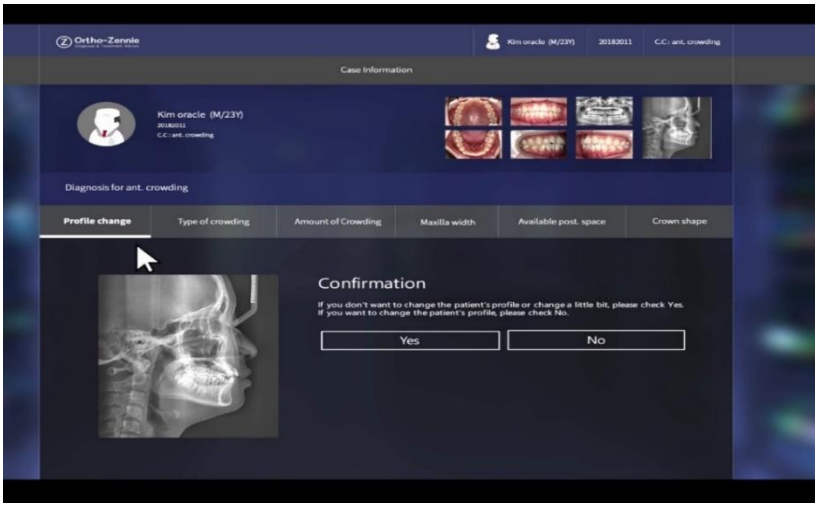
There will be no other mysterious machine (FDA does not see Dr Watson as a medical device) or intelligence than IBM's Doctor Watson Health. But on the inside, Dr. Watson is very unstable and yet medical A.I. shows a lot of work to be done. In particular, IBM's claim that half of the treatment is performed without medical grounds is frightening beyond its substance. (In Korea, it will be surprising how many antibiotics are being treated to a simple cold.) Dr. Watson and Google's challenge for medical A.I. have many implications. This can easily predict that medical A.I. will be responsible for much of medical care in the near future. But the problem is the rules and regulations of each country. Almost all countries do not allow direct clinical use of medical AI. But many pioneers will test it and will succeed in the end. The key to shortening the time of success is how to collect pure data for learning. All human data is known as 1,100TB, but this is likely to be significantly reduced. Many digital health devices and DApps will pour data endlessly because these are designed to help human health. How to sort and analyze such data will be the key. For example, the cancer detection rate of Watson's medical care varies greatly with races. This is due to a lack of data. In 2015, 38 people died from the Middle East Respiratory Syndrome (MERS-CoV) infection in Korea. The whole world has failed to come up with any alternative, just treating the disease and leaving human lives in luck. However, the infection route has surprised us again. Almost all of them were spread through hospital infections. The misdiagnosis is very high because even the same germs and viruses show very different symptoms. Attempts to resolve this infection prevention through data-based A.I.. are revolutionary.

Whether Medical A.I. can replace doctors is a separate matter from the development of Medical A.I. Let's imagine to a fully learned medical A.I. situation in the future. Someone has been seriously ill. Medical A.I. accurately predicts the diagnosis of this person's disease and presents a treatment or surgical method. But the decision is ultimately up to humans. The core of Medical A.I. should focus on the prevention of disease. Diabetes, one of the most painful chronic diseases for people today, is the key to managing blood sugar through dietary control. Doctors do not help this. However, the A.I. blood glucose prediction system has dramatically adjusted patients' blood sugar levels with data learning from continuous blood glucose measurements. Zeniton, founded by dentists and engineers, is considered a leader in the dental field of medical A.I. Zeniton's Dental Image A.I. "Ortho-Zennie" is a great help to dentists' orthodontic plans. "Ortho-Zennie" is designed from the problem that dentists in most developing countries are not able to make their own orthodontic designs while emphasizing the need for orthodontics. "Ortho-zennie" is an A.I. analyzing all the data of thousands of calibration cases and giving the most effective orthodontic plan with the x-ray photograph of the patient only. In addition, the data they collect can simultaneously be DNA tested not only in dentistry but also in the digestive system, which is known to be closely related to intravenous bacteria. In short, there is a world where no future medical care can be described without Data. The various phenomena related to the use of medical data will be expanded further. In particular, some experts believe that Medical

A.I. will completely replace in some areas of medical practice. Currently, no medical A.I. technology produces visible profits or results yet. But everyone is preparing. In the end, it will dominate all the medical care in the world.

Comprehensive model of Medical A.I. technology is shown below. Of course, research labs, companies and hospitals, including Medical 4th Chain are coming up with practical results.

A. Artificial neural networks for disease detection purpose : Early detection of cancer A.I. / Diagnosis of genetic diseases A.I. / A.I. using image data to derive an environment that requires



The Medical A.I. that identify condition of the patients' teeth and perform the orthodontic treatment immediately has been widely spread. (Zeniton's Dental Image A.I. “ortho-

surgical surgery.

B. Artificial neural networks for diagnosis, screening and testing : Screening of fetal genetic diseases by gene mutation investigation / A.I. who collects patient's daily data or disease data to infer patient's future state variables

C. Clinical Research Field A.I. : A.I. as a model to determine the priority of treatment through disease modeling and case search for treatment.

D. Diagnostic treatment / rehabilitation A.I. : Predictive treatment of unexpected diseases such as respiratory disorders based on the patient's condition

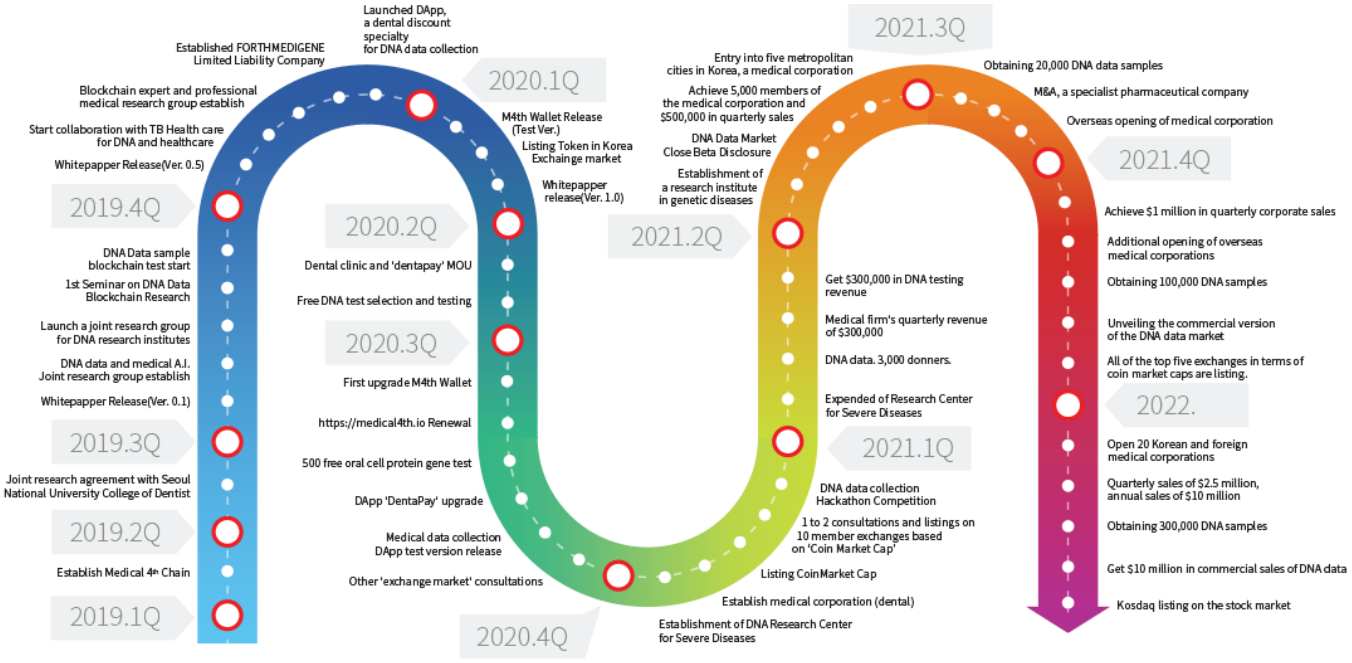
E. Detection of adverse drug effects : Identify the best medicine and detect side effects using Data Mining to categorize patients.

F. Drug resistance detection : Predict resistance to drugs based on genetic information

G. Determination of dose of drug : Optimized drug dosage determination

H. Treatment Risk Assessment : Learning to learn the outcome of treatment

11. Road Map


2019.1Q
Establish Medical 4th Chain
2019.2Q
Joint research agreement with Seoul National University College of Dentist
2019.3Q
Whitepapper Release(Ver. 0.1)
DNA data and medical A.I. Joint research group establish
Launch a joint research group for DNA research institutes
1st Seminar on DNA Data Blockchain Research
DNA Data sample blockchain test start
2019.4Q
Whitepapper Release(Ver. 0.5)
Start collaboration with TB Health care for DNA and healthcare
Blockchain expert and professional medical research group establish
Established FORTHMEDIGENE Limited Liability Company
2020.1Q
Launched DApp, a dental discount specialty for DNA data collection
Whitepapper release(Ver. 1.0)
Listing Token in Korea Exchainge market
M4th Wallet Release (Test Ver.)
2020.2Q
Dental clinic and 'dentapay' MOU
Free DNA test selection and testing
2020.3Q
First upgrade M4th Wallet
https://medical4th.io Renewal
500 free oral cell protein gene test
DApp 'DentaPay' upgrade
Medical data collection DApp test version release
Other 'exchange market' consultations
2020.4Q
Establishment of DNA Research Center for Severe Diseases
Establish medical corporation (dental)
Listing CoinMarket Cap
2021.1Q
DNA data collection Hackathon Competition
1 to 2 consultations and listings on 10 member exchanges based on 'Coin Market Cap'
Expended of Research Center for Severe Diseases
DNA data. 3,000 donners.
Medical firm's quarterly revenue of $300,000
Get $300,000 in DNA testing revenue
2021.2Q
Establishment of a research institute in genetic diseases
DNA Data Market Close Beta Disclosure
Achieve 5,000 members of the medical corporation and $500,000 in quarterly sales
Entry into five metropolitan cities in Korea, a medical corporation
2021.3Q
Obtaining 20,000 DNA data samples
M&A, a specialist pharmaceutical company
Overseas opening of medical corporation
2021.4Q
Achieve $1 million in quarterly corporate sales
Additional opening of overseas medical corporations
Obtaining 100,000 DNA samples
Unveiling the commercial version of the DNA data market
All of the top five exchanges in terms of coin market caps are listing.
2022.
Open 20 Korean and foreign medical corporations
Quarterly sales of $2.5 million, annual sales of $10 million
Obtaining 300,000 DNA samples
Get $10 million in commercial sales of DNA data
Kosdaq listing on the stock market

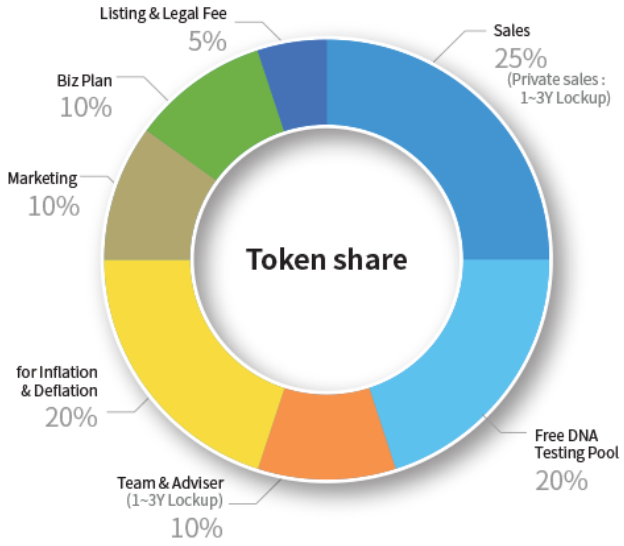
Medical 4th Chain

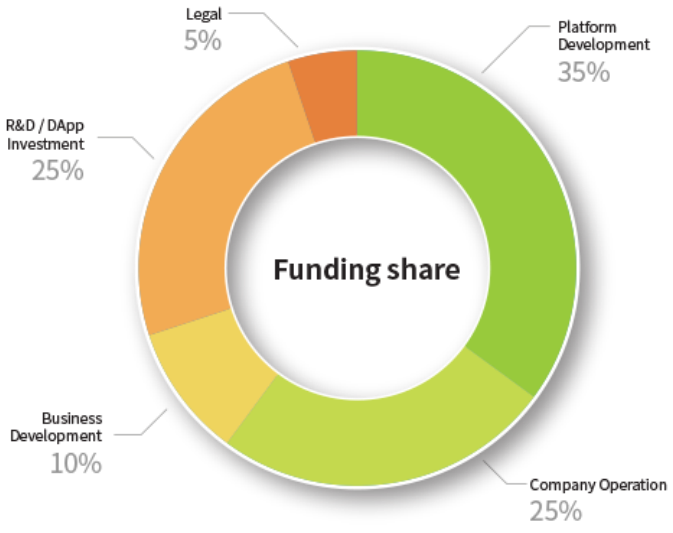
12. M4th Token Condition

Total Token **4,000,000,000 M4th**

Listing 2020. 3.

Information about Private sales manager@medical4th.io





13. Members Community

Young Cho | Block Architecture / Co-Founder

MBA / University of California, Riverside

Kia Motors | Technical Research

General Motors | Technical Research

Medical Chain Labs. | Founder

Dae-kyung Ji | Doctor of Dental Surgery / Co-Founder

M.S.D(Master of Science in Dentistry)

Seoul National University, School of Dentistry

ZTA Technology Co.Ltd. | CEO

Zeniton Co.Ltd.| CEO

Gi Seok Bae | Molecular Biologist (Ph.D) / Team

Ph.D / Biotechnology and Innovation / Box Hill, AU

Dankuk University, Department of Biosafety,

BIOnME, Inc. I Founder, CEO, CTO

Dankuk University Institutional Biosafety Committee (IBC)

Hak Lee | Doctor of Dental Surgery / Team

M.S.D(Master of Science in Dentistry)

Seoul National University, School of Dentistry

Korea University Graduate School Department of Public Health Science

ZTATechnology Co.Ltd. | Co Vice President

Jong Kuk Lee | Doctor of Dental Surgery / Team

M.S.D(Master of Science in Dentistry)

Dankuk University, Department of Pre-Dentistry

ZTA Technology Co.Ltd. | Co Vice President

Yun Sik Lee | Biotechnology(Ph.D) Professor / Team

Ph. D | Biotechnology | University of Tokyo

Professor | School of Medicine University.of Pennsylvania

Researcher | National Institutes of Health US

Researcher | Ministry of Health JAPAN

Huny Hwangbo | Lawyer / Team

Lawyer | Auckland University Law School

Marketing / University of Tennessee

Associate Partner @ Al Dhaheri International Lawfirm, Dubai;

Partner @ QLP MENA Lawfirm; & Goodwins Law, Abu Dhabi Office

Jung Tae Lee | Doctor of Dental Surgery (Ph.D) / Team

Ph. D | Dental Science

Seoul National University, School of Dentistry

Bio&Me DNA Research Institute | Director

BIOnME, Inc. I Founder

Jae Yong Park | Doctor of Dental Surgery / Team

M.S.D(Master of Science in Dentistry)

Seoul National University, School of Dentistry

Korea University, School of Mechanical Engineering

Zeniton Co.Ltd. | Senior Managing Director

Mikael, Lee | Team & Founder/Sys Architect

University of Canberra Software Engineering

Samsung Electronics Company | Service Engineering

C-NET KOREA | Media Development

WEVERNET Software CO., Ltd. | Founder

Medical Chain Labs. Medical Chain Co. | Founder

Kim, In Kyu | Professor of Peking Univ (Ph.D) / Adviser

Ph.D | Economics of Peking University

Professor International Economics, Peking University

Seoul National University, Department of Economics

Professor of International Economics, Chongqing University

Chen, Yanhua | International Marketer (MBA) / Team

MBA / University of North Texas

Business Administration of Sungkyunkwan University

Huangtudi Co.Ltd.. as COO

Sang HyunPark | Plastic Surgeon (Ph.D) / Adviser

Ph.D | Yonsei University. College of Medicine

Professor of Yonsei University. College of Medicine

Director of Planning the Korean Association of plastic Surgeons

Director of We Start

Khae Hawn Kim | Urologist Doctor (Ph.D) / Adviser

Ph.D / Choongnam University of Medicine

Chairman and Professor, Department of Urology
| Gachon University School of Medicine

Medical Director, Department of Urology
| Gachon University Gil Medical Center

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