

Open Therapeutics



Developing a Global Scientific Community around Therapeutic Intellectual Properties.

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Executive Summary

We are “open sourcing” intellectual properties (IP).

Scientists. They are the most highly educated population on Earth. They increase the knowledge that changes the way we understand our world and the universe. Scientists are influencers and decision-makers at every level.

However, scientists work in a broken system dominated by a “publish or perish” model. Researchers are dependent on grant funding to support the experimental work that leads to a publication. The process of applying for a grant and writing a manuscript requires an intensive investment of time and labor, which could otherwise be used for conducting research.

Compounding this problem is the protectionist “silo” model of science: research teams working in isolation, not sharing knowledge across the boundaries of their institutions. Worse still, if an institution doesn’t monetize a researcher’s work through product development, publication, or patent, it may never see the light of day. So the value of the research is never realized, and other researchers miss out on the opportunity to build upon the work of others, often wasting time by duplicating the same research

Open Therapeutics disrupts this broken system with an open science platform powered by distributed blockchain technology. The Therapoid™ platform opens up dormant and orphan (“unused”) scientific intellectual property (IP), enables scientific collaboration across the globe, and allows researchers to share their research results immediately. Open Therapeutics’s grant system gives funders and grantees direct access to one another, plus management and verification tools to achieve shared goals efficiently.



The Therapoid platform is the scientific collaboration ecosystem powered by the utility ScienceCoins™, “The Currency of Knowledge”. Scientists will be able to conduct smart contract-based transactions with grant funders, vendors, service providers, and other scientists using ScienceCoins, which they earn by joining, participating in, and contributing to the Open Therapeutics scientific community. This forms a crowdsourced economic and scientific ecosystem that rewards scientists for conducting and sharing their research in the Therapoid platform.

ScienceCoins will be stored on the Ethereum blockchain, assuring integrity and flexibility. In the quickly expanding realm of blockchain technology, Ethereum has emerged as a versatile, rigorous platform for facilitating peer-to-peer contracts and applications.

Open Therapeutics expects to launch the ScienceCoins token to serve as “The Currency of Science” for IP providers, researchers, institutions, grant providers, and scientific vendors. Researchers collaborating on the Therapoid platform will be awarded ScienceCoins for conducting research and collaborating. In short, the researchers get paid to do science using the Platform.

Background & Mission

Before Lyft®, no one thought to put a value on an empty car seat. With Airbnb®, many were surprised that an unused room in a home could have market value. Until now, unused intellectual property (“IP”) was not economically valued. Open Therapeutics is a platform business model that will leverage underutilized therapeutic IP by matching IP producers with IP consumers.

The global value of IP that is unused is estimated to be \$4 trillion dollars.¹ Currently, academic institutions can utilize only about twenty percent (20%) of their intellectual property, which represents “up to \$1.3 trillion to U.S. economy and supported up to 4.2 million jobs since 1996.”²

The Therapoid platform crowdsources the global scientific and engineering communities around unused IP, so they can collaborate on research projects, gain grants, share laboratory resources, get early feedback through preprint service, develop manuscripts for publication, and earn ScienceCoins. We aim to help scientists around the world find previously hidden knowledge, connect with others to grow that knowledge, disseminate their findings more quickly than through the traditional publishing model, and reward them for their contributions to the scientific community.

The current western drug development process is labor and time intensive. It is also very risky. In the USA, the typical cost from development-to-market is \$2,600,000,000.00, takes at least 12 years, with only a 7% success rate.³ As reported by the National Science Foundation, the spending in 2013 for pharmaceuticals and medicines research and development (R&D) accounted for the largest domestic R&D expenditure paid for by companies (\$264,913,000,000.00).⁴ This cost/risk model is frequently “used to explain why drug giants merge, and why they must charge high prices. The reality is somewhat different.”⁵

Open Therapeutics believes the pharma industry is poised to include a new business model – or be disrupted – and some are responding.⁶

In late-2017, after spending 8-years of developing and attracting synthetic biology-based technologies, Open Therapeutics is freely providing therapeutic biotechnologies to the global community in the scientific collaborative crowdsourcing platform, Therapoid.

Simplistically, we are doing for therapeutics what Red Hat®/Linux does for computing® and Airbnb® does with underused lodging.⁷

Other early adopting pharmaceutical firms crowdsourcing open biotechnologies to enhance their drug pipeline include Boehringer Ingelheim®, AstraZeneca®, and Sanofi®.^{8 9 10}

Open Therapeutics is an early promoter and adopter of Open Science.¹¹ Open Science is an open source methodology applied to biotechnologies and pharmaceuticals and Open Therapeutics is a leader.¹²

The NIH’s Open Science Prize, the White House’s call for Open Innovation, and Senator Coons’ Crowdsourcing and Citizen Science Act of 2015 are additional forcing-factors. Also, the European Commission is mandating open science and open access by 2020.^{13 14 15}

OpenTherapeutics.net is an agnostic, accessible, and secure web platform. It hosts the freely available therapeutic technologies and crowd-sources a collaborative interdisciplinary workflow process. One of those technologies is an analogue to Amgen®’s IMLYGIC®, which has U.S. FDA approval.¹⁶

The platform manages a number of interconnected incentives. In addition to the free biotechnologies, the Therapoid hosts the entire scientific workflow process, from adopting the open biotechnologies, gaining grants and free lab equipment, to publishing the collaborative results on a preprint server.

A Disruptive Model

In 2009, Open Therapeutics began developing technologies to open-source on a crowdsourcing platform called Therapoid™; a U.S.A. patent-pending collaboration platform that began being built in 2015. Although still in “soft launch” pilot phase, the Therapoid platform has already begun to attract scientists from around the world for

collaboration around therapeutic IP. This pilot site is at <https://Therapoid.net>. The Therapoid platform will complement the Knowbella Platform™ with unused IP in other scientific disciplines.

The Therapoid platform provides a matching service for IP producers looking to derive value from unused IP, and IP consumers, the scientists who do new research based on that IP. Open Therapeutics has the potential to add market value to the nearly \$4 trillion of underused IP.¹⁷

By open sourcing intellectual property into a crowdsourcing platform, Open Therapeutics enables knowledge and value to grow in untold new and different directions, disrupting the patent-driven silos of knowledge and the artificial borders that currently exist in research and development. We want to open up and decentralize science, in order to maximize social good, generate economic incentives, and improve our world.

The Open Therapeutics philosophy is based upon bringing collaboration back to science, particularly among underserved scientists. This is the way science once was, and the wave of the future (see [Supplemental Literature](#)).

“If I have seen further, it is by standing on the shoulders of giants.”¹⁸
Sir Isaac Newton

Problem

Scientists labor for months, even years, to produce findings that increase knowledge and, perhaps, benefit society. These findings undergo a lengthy, somewhat controversial peer review process in order to get published. A published manuscript is available only in expensive subscription journals or, when possible, in Open Access journals funded by steep Article Processing Charges (APC) usually paid by the authors. Scientists are dependent on publications to secure their next round of funding, advance their authorship status, and achieve career tenure. It is a cumbersome process with many pain points, and these scientists are the fortunate ones. Some see their findings stuck in lengthy peer review or unpublishable due to negative results or unoriginality. Others simply don't have the resources to participate in this system at all. In the meantime, a potential goldmine of unshared knowledge collects dust, out of reach of scientists who could grow its value.

Unused Intellectual Property

Unused IP sits on the shelves of many corporations, universities, inventor workspaces and other locations. The research, data, and insights within this IP are never published or shared, due to budgetary constraints, lack of market insights, lack of awareness of the IP, or lack of perceived marketability and value. Technology Transfer Officers must make tough decisions on which IP has marketability. However, those decisions are often based on the limits of the jurisdiction in which the IP was filed or budgetary constraints. When that IP is opened up to the global scientific community, new opportunities never previously envisioned may be realized.

Protectionist Research Silos

Science is a social endeavor, but in today's competitive environments, much of modern science is conducted in “patent silos” - scientists working in isolation, their research locked down within the boundaries of institutions. This hinders knowledge growth, discovery, and innovation.

Cumbersome, Time-consuming Peer Review Process

Many scientists are frustrated with the costs, timeline, and procedures required to get their research reviewed and published. Publisher peer review and workflow processes can take up to a year or more and require a serious investment of additional researcher time. The researcher's work sits idle instead of being advanced into the global scientific community.

Awkward Funding Relationships

Grant funders depend on published research as verification of their financial support, so they have to navigate the same cumbersome, time-consuming system. Sponsors looking to drive innovation have to deal with too many third parties and “middle men” to support the research they believe in.

Public Knowledge Gap

A great divide exists between the professional scientific community and the public.¹⁹ Increasing awareness and enthusiasm toward scientific innovation is critical to improving our society and environment. There is an opportunity to bridge any gap between science and the public to grow support and continue funding scientific research.

Lack of Access for Underserved Scientists

Globally, there are many scientists that want to collaborate with fellow researchers, but have limited or no access to IP and collaborative tools. They also want access to Key Opinion Leaders who influence careers and facilitate pathways to publishing and funding. Underserved scientists have great potential to make significant contributions to science, but many cannot even afford access to scientific journals or basic lab equipment.

Fragmented Innovation and Collaboration Tools

A large number of excellent tools and services exist to support and enhance scientific collaboration, innovation, and development, but they are fragmented across multiple vendors and systems. This creates great inefficiencies that slow the pace and quality of innovation. There is no end-to-end ecosystem that serves IP producers and consumers rather than the needs of the tool and service providers.

Diverse, Complex Transactions

Science happens in a transactional space. Grant funding is a transaction of money. Publishing is a transaction of information. Peer review is a transaction of time and expertise. There are many players (scientists, funders, institutions, publishers, etc.) and many assets (IP, money, equipment, knowledge, etc.). The complex exchange of these diverse assets among the many players raises concerns of trust and security. Any solution must address these concerns.

Solution and Product

There is a better way.

Reduce the barriers and time to publication. Provide scientists and researchers around the globe with IP, community and tools to innovate with. Bring value to IP that would previously have languished as abandoned and worthless. Develop a currency for transactions in the scientific realm, one that rewards scientists for doing the science that they love.

This is the promise of Open Therapeutics.

The Therapoid platform’s end-to-end scientific collaboration ecosystem is designed to solve the challenges of the current scientific research environment. The platform will unlock unused IP and provide significant rewards and incentives to researchers to build on that IP to advance science.

Open Intellectual Property

Open Therapeutics opens up IP for the benefit of all. Unused IP brings no value to the institution or inventors. In some cases, the IP might actually be costing money. By out-licensing unused IP to an open platform, scientific institutions can unlock the value of their IP by exposing it to a global community of science-minded users. Interdisciplinary open review of unused IP may produce new applications and discoveries that otherwise may never develop. Opening up this locked-down knowledge to the wisdom of the crowd could result in significant

discoveries and innovations. Some might say that unused IP has no value. Our response? One scientist's trash may be another's treasure.

Open Science and Research

Open Therapeutics makes open IP available to a community of professional researchers, citizen scientists, teachers, students, and enthusiasts – anyone looking to contribute to the advancement of discoveries and innovations. By collaborating across borders and institutions, we can accomplish great things and improve our world. All research based upon IP within the Therapoid platform must be made available under a Creative Commons 4.0 and Copyleft model.^{20 21} This Open Data and Open Access model is novel for the modern science culture, but it returns science to the open and collaborative model that fostered world-changing discoveries such as the cure for smallpox.²²

Accessible Peer Review Process

The Therapoid platform supports the “Open Access” publishing model, putting much of the control of publishing science back into the researcher's hands. Since all research is open, authors may seek “pre-peer review” at any point in the manuscript development process so potential problems can be addressed before a significant investment of time is made. Finished manuscripts are uploaded to a Preprint server for further review and for Open Access publishers to compete to publish them.

Direct Funding Relationships

Whether from large grant-issuing institutions or crowdsourcing philanthropic donations, the Therapoid platform connects available funds with researchers and establishes mutual trust, transparency and accountability via blockchain technology. As a result, the Therapoid platform promotes the success of shared research goals.

Engaged, Empowered Public

The Therapoid platform enables everyday enthusiasts and citizen scientists to learn, collaborate, observe, donate funds, and even vote on projects that should receive funding. With market acceptance of the Therapoid platform, donations, grants, and sponsored research will grow, continuing to bridge the gap and empowering both scientists and science-minded citizens.

Access for Scientists

Open Therapeutics' Open Research model enables scientists, particularly the underserved, to gain access to knowledge, networking, and resources that have previously been out of reach. Scientists can collaborate across the globe, do research around open IP, acquire equipment through a free Asset Exchange, and review the findings of research projects as they are underway. Fulfillment of this unrealized potential benefits both individual scientists and the cause of science.

Therapoid Value Propositions

Therapoid™ is a free scientific collaboration web platform that hosts unused IP grants and funding, free lab equipment, and a preprint server: <https://Therapoid.net>.

Any IP qualifies! Disclosures not being moved to provisional; Provisional filings not being moved to non-provisional; expiring patents; know-how; unpublished manuscripts, unfunded grant applications, etc. Open Therapeutics does not decide what to take. If the researchers want to provide it and generate value, the global scientific community will decide if they want to pursue the unused IP.

What is in it for the Intellectual Property Office?

- Open Therapeutics freely promotes your out-licensing portfolio
- Increase the number of licenses by out-licensing the dormant and orphan IP
- Bring sponsored research attention to your researchers
- Stimulate international collaborations

- Bring grant funding attention to your researchers
- Become a knowledge center using dashboard data
- Gain Sponsors
- In the case of public institutions and government, the abandoned IP is not providing a return to the Taxpayers
- Gain or maintain positive morale of the researcher, particularly when the IP is not moved to prosecution, is idle, or is abandoned.
- Brand enhancement
- Doing a social good

What is in it for the Inventor?

- Enhances international scientific collaboration
- Gain co-authorships from other scientists moving the dormant/orphan IP forward
- Collaboration is optional
- Gain sponsored research
- Access grant funding
- Help with gaining grants from funders that require Open (Gates Foundation, Wellcome, etc.)
- Gain honoraria and speaking engagements from collaborators and industry
- Maintain knowledge leadership around the IP; proliferate your science
- Publish to preprint server where publishers compete for manuscripts
- Career advancement

Integrated Innovation and Collaboration Tools

Open Therapeutics' Tech's end-to-end ecosystem gathers inventors, institutions, researchers, foundations, educators, students and citizens together, and gives them the tools to work together to advance science. Free access to the platform includes open IP, network and community building features, communication and collaboration tools, a grant management system, manuscript development process, preprint server, free equipment exchange, and advanced search and matching tools to find and connect with the people, projects, content, and resources most relevant to each user's interests and goals.

Smart Contract Transactions

Open Therapeutics uses Smart Contracts on the Ethereum blockchain to transact within the platform, with ScienceCoins as "The Currency of Science." Smart Contracts are the foundation upon which the Open Therapeutics scientific community is decentralized and self-governing. Transactions are stored on the Ethereum blockchain, providing transparency, efficiency, and security for all parties. ScienceCoins are also the currency of the Open Therapeutics rewards system, incentivizing users to grow the Open Therapeutics community.

Why Blockchain? Why Ethereum?

At Open Therapeutics's core is fostering open science, free of artificial boundaries or restrictions where participants can interact with one another in a trusted manner. Blockchain can help us enable decentralized trust in ways not previously possible. Open Therapeutics seeks to utilize these new capabilities to create a trusted network for scientists to collaborate, conduct transactions, and share their discoveries; and it sets the stage for inconceivable innovation in the future.

Blockchain technology has been widely recognized as the driver of the next seismic shift, comparable to the impact of the Internet in the 1980s. Ethereum's ingenuity and leadership clearly demonstrate that it is a key innovator of

the technology's development. Integrating Ethereum blockchain technology into the Therapoid platform not only enables solutions to long-standing barriers to scientific innovation. It fuels the growth of the Open Therapeutics community with the power of cryptocurrency, and anchors Open Therapeutics firmly in a prime position to realize the promise of the blockchain.

The blockchain-powered Therapoid platform enables the most suitable solutions, assets and human capital from around the globe to become available to regional or even specific local communities in the most cost-effective manner, unencumbered by foreign IP laws and incompatible business practices.

Moving from the centralized storage of scientific data to a blockchain protects it against system failure, fraud, censorship and other security risks. With a blockchain, the research and its provenance can be stored via a storage protocol such as Ethereum's Swarm or the "InterPlanetary File System" (IPFS)²³. These decentralized and distributed systems can store and relay large volumes of information, without the potential downfalls of large, centralized servers.

With the Ethereum blockchain's smart contracts and immutable ledger powering transactions of funds, research, resources, staffing, and more, we can minimize friction and costs typically associated with the conduct of science in research institutions.

Ethereum blockchain technology streamlines a comprehensive ecosystem around open technologies, empowering the Therapoid platform and community with a framework for unimaginable innovations based on blockchain transactions.

ScienceCoins™ Tokens

The blockchain managed ScienceCoins, as "The Currency of Science", are the glue that holds the Open Therapeutics community together and the fuel that helps it to grow, accelerating the success of shared goals.



The ScienceCoins token serve multiple important functions for the Platform:

- Medium of exchange between scientists and vendors/service providers. With a critical mass of the scientific community trading directly in ScienceCoins, bypassing existing intermediaries and their fees, transaction times and costs are reduced, resulting in more money being directed to conducting research.
- Cross-border funding: ScienceCoins substantially reduces friction and cost of moving research funds to scientists, regardless of their country of residence. Cross-border funding drives scale in the amount of work performed.
- Incentivizes scientists to collaborate within the Platform to develop unused IP and build the Open Therapeutics community.
- Enables Open Therapeutics to drive engagement with specific platform features and content to achieve a critical mass of users.
- Enables ScienceCoins token holders to guide the features and functions of the platform with voting rights bestowed with ScienceCoins token ownership.

- Provides ScienceCoins token holders with economic rights to Open Therapeutics, when converted to Class H Units.

While some of these functions could be served with blockchain and an existing cryptocurrency or token, by using the ScienceCoins token dedicated to this particular scientific ecosystem, a critical mass is more quickly realized and mobilized, and the funds from a token sale ensure that the tools are developed as quickly as possible.

Knowbel™ Tokens

Open Therapeutics intends to also issue an internal, non-fungible cryptographic token based on the ERC-721 standard. The Knowbel token serves to digitally represent its assigned owner in matters of voting. These tokens will be issued to users once they are recognized as a constructive member of the platform. Members prove themselves simply by performing a combination of the same actions they would perform to be rewarded ScienceCoins.

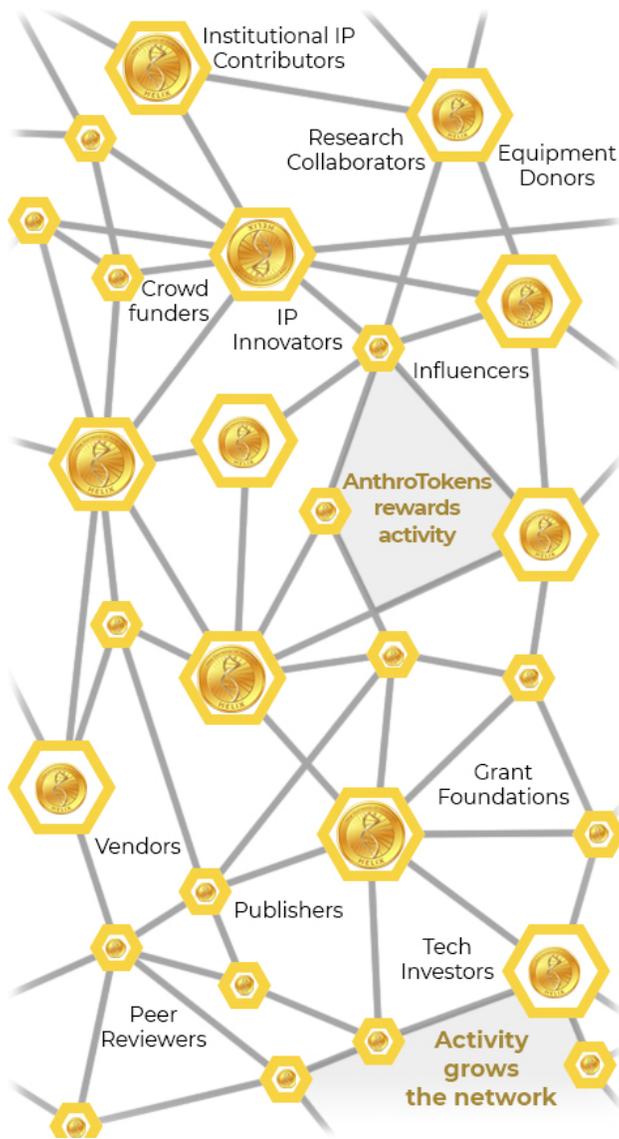
The Knowbel token will be issuable only by the Therapoid platform. It will not be freely tradable by its assigned owner and would never be available on an exchange. Members will only ever have at most one Knowbel token and even this might be revoked by the Therapoid platform should access to the member's account be compromised.

Members who control a Knowbel token would be able to use this to vote on the Therapoid platform on scientific matters; for example, the best proposal to be awarded grant funding.

Other Tokens

Other tokens may be created and issued within the Therapoid platform for more tactical applications. For example, in the blockchain-enabled grant process (See below: **Sample Application: Grant Funding and Management**), grant-specific ERC-20 tokens may be issued as a receipt. These tokens then permit voting rights by the grant funders when determining whether the resulting research satisfies the grant proposal's goals.

These sorts of tokens are tactical in nature, solve specific technical challenges and would not be sold by Open Therapeutics or be available on exchanges.



Token Wallets

Open Therapeutics will use an ERC-20-compatible smart contract for its ScienceCoins. As is normal for ERC-20 tokens, ScienceCoins, as “The Currency of Science”, will be stored on the Ethereum blockchain in a smart contract.

The wallet required for managing ScienceCoins is any standard Ethereum wallet that supports ERC-20 tokens, and since ScienceCoins will be publicly tradable, any ERC-20 compatible wallet would be useful for managing ScienceCoins.

However, the Therapoid platform will also provide an integrated wallet for its users to receive, send and otherwise manage ScienceCoins, Knowbel and any other tokens it issues. During registration, each user can opt to create their wallet using a secure passphrase of their own choosing. The platform will encrypt the user’s private key with this passphrase. The Therapoid platform™ will no longer have access to the user’s private key and therefore to their wallet.

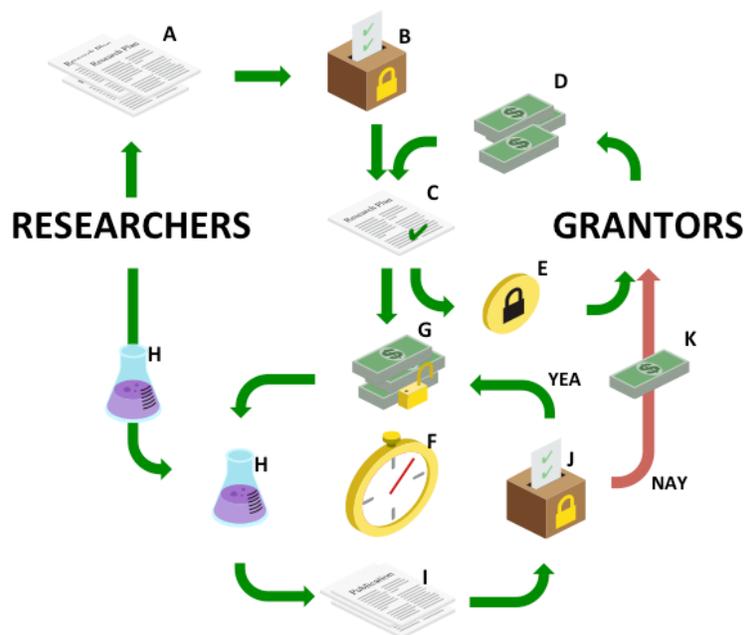
ScienceCoins and Blockchain Technology Powers Innovation

Sample Application: Grant Funding and Management

Grant funding is the fuel that powers scientific research. We intend to offer grants to scientists applying to Request for Proposals (RFPs) from grant funders. Eventually, we anticipate matching grant funds from the large grant funders to be offered to the scientists to conduct research and produce publication outputs.

One of the key uses of the blockchain by Open Therapeutics is for managing grant funding. By removing the expensive overhead of grant management usually conducted by attorneys and accountants, the blockchain will enable a higher amount of money to go directly to the scientists.

The following blockchain grant model is U.S. patent-pending and represents only a single configuration as an illustration of the general model.



Researchers of the Open Therapeutics community produce research proposals (A).

Proposals have defined a number of tranches, each defining:

- 1) Cost of research (inclusive of personnel, equipment and supplies);
- 2) Required duration of the tranche;
- 3) Clearly defined goals and outputs (publications, etc.).

When there are numerous proposals put forth by the community for a single Request For Proposal (RFP), the community may choose to vote (B), which will be put forward for funding. The Knowbel token enables community voting.

The winning research proposal is permanently and indelibly stored via Ethereum's Swarm or IPFS (InterPlanetary File System) and its URL and its cryptographic hash is stored for future reference and verification in a newly instantiated smart contract representing the relationship between the grant funders and the researchers submitting the proposal. This "grant contract" (C) is also configured with the budget, time required for each of the tranches defined in the research proposal and other parameters. The new grant contract sits on the blockchain and waits to be funded.

One or more grant funders provide funds (D) by sending ScienceCoins or Ether to the grant contract where it will be escrowed. In exchange, the smart contract will automatically issue grant tokens (E) in proportion to the funds received back to the funder to serve as both a receipt and as a voting instrument for future use.

The grant contract will continue to wait until it receives enough funds to satisfy the requirements of all tranches of the research proposal. If the smart contract fails to be sufficiently funded before an agreed deadline, grant funders may exchange their grant tokens for the funds they provided (as ScienceCoins or Ether).

If, however, the full amount of funding is received, parties are notified and the grant contract will begin the grant process either immediately, or on a preconfigured future date. Once begun, researchers receive funding (G) for the first tranche of research. This funding will be provided as ScienceCoins or Ether (whichever was provided by the funders), but the researchers are free to convert this into their local currency using 3rd-party services.

Note that due to the relatively high volatility of the cryptocurrency market, escrowed ScienceCoins or Ether by itself is subject to relatively high foreign exchange risk. To mitigate this, the grant contract may be optionally configured to convert the remaining escrowed funds into a so-called "stablecoin" (such as Maker's DAI token), at the time the grant process begins.

Since the grant process has now officially begun, researchers will use the funds issued and the time available to perform the required research (H). On or before the tranche's deadline, researchers will present their deliverables (I) to the grant funders for review. Grant funders review the deliverables and vote (J), using their grant tokens, whether they believe the deliverables meet the criteria described for the respective tranche of work in the grant proposals.

If a vote doesn't take place by the required time (F) as directed by the grant contract, or if the collective vote determines that the work doesn't meet the criteria, then the grant process is immediately terminated. Grant researchers may present their grant tokens to the grant contract to exchange them for their proportion of any funds remaining (K) in the grant contract. The grant funder may choose whether to receive the stablecoin, or the equivalent amount of Ether.

If the vote decides the research deliverables sufficiently meet the defined criteria, then the next tranche of work begins by converting a proportion of the stored stablecoin back into Ether, which is then sent to the researchers to fund the next tranche of work (G).

The process continues until all tranches are complete, or any one of them fails.

The grant process flow:

- 1) Grant request for proposals (RFPs) are issued by philanthropic entities, corporations, and institutions within the scientific communities hosted in the Therapoid platform. Based upon the proposals and the collaboration/participation of the proposer, the scientists in those communities vote on who should receive the grants, as a recommendation to the grantors.
- 2) Grant funding is managed on a blockchain for transparency and efficiency.
 - a) Transparency: Funds are traceable from the grantor all the way to the researcher.
 - b) Efficiency: With the confidence of the blockchain, more money goes to research and less goes to overhead accounting, legal, etc.

There is often backlash against charities where significant portions of donated monies are never actually used for the targeted research.²⁴ The Open Therapeutics model demonstrates transparent movement of all funds, and enables grant providers to target their monies to specific types of research.

Other Transaction Applications

Crowd-Sourced and Community-Managed Grants: The process above could be modified to enable a collection of micro-funders to directly contribute to scientific research they believe in, similar to the Kickstarter model but with the benefits of smart contracts.

IP Matching: As a matchmaking service between IP producers and IP consumers, the Therapoid platform creates an opportunity that simply doesn't exist in a science and IP space that has labored under a "protectionist" mentality. Contributions based on the IP are shared back to the community, making each advance more valuable for the next researcher that looks at it, adopts it, takes it further, and so forth.

IP Referrals and Review: To accelerate innovation, IP consumers could offer their earned ScienceCoins as reward for the discovery of IP relevant to specific research, and IP producers could use ScienceCoins incentives to reviewers who identify their unused IP with the highest potential value.

Building Project Teams & Gig Economy: Platform members could offer their earned ScienceCoins as an incentive to other members to join a new research project, provide specific key expertise on an as-needed basis, give early peer review on a manuscript-in-process, answer legal questions, and task work such as data formatting, technical writing, illustration, etc.

Equipment Transactions: Therapoid platform members may transact with ScienceCoins to purchase and sell goods and services, such as lab equipment, consumables, shipping and maintenance, and emergent tools and services, from the vendor network hosted through the Platform's Asset Exchange. With ScienceCoins tradable on financial exchanges, vendors can convert to fiat currencies or other digital currencies such as Bitcoin or Ethereum, subject to confirmation that an SEC-registered exchange exists for ScienceCoins trading.

Licensing Platform

The Therapoid platform is exclusively licensed to our partner, Knowbella Tech, LLC. Knowbella Tech, LLC will launch a complementary platform that crowdsources all non-therapeutic unused IP.

After the ScienceCoins token issuance, the partner Knowbella Tech, LLC will launch its scientific IP platform using the same model used by Open Therapeutics. The Therapoid platform will host all IP all therapeutic IP. Examples of IP categories that Open Therapeutics will be able to curate on its platform include medical devices, pharmaceuticals, and healthcare diagnostics.

To accelerate our path to critical mass, liquidity, and scale, up to 100,000 early adopting scientists will be awarded with ScienceCoins when they conduct science on the Platform. This may be adjusted at the discretion of the Company.

This serves as a model for a future co-branding business model for organizations seeking an internal collaboration platform.

ScienceCoins™ Role & Economy

Open Therapeutics plans to issue only 16,666,666 ScienceCoins. As the platform grows, both in terms of the number of active users and the number and types of transactions that occur between users, the demand for the ScienceCoins token will grow. The economics of Supply and Demand dictate that growing demand will create deflationary market pressure.²⁵

Early adopter scientists are provided ScienceCoins for adopting the Platform. The scientists' contributions to research and collaboration on the Platform earn ScienceCoins. Numerous activities of the scientific community can be rewarded in ScienceCoins. Scientists will be able to utilize their tokens within the ecosystem for the purchase of goods and services otherwise paid for by traditional payment methods or local fiat money. Hence, true token utility is created within the scientific community and within the ecosystem. This utility token combined with high number of scientists performing work should be recognized by ScienceCoins token purchasers and should create a liquid market.

This fundamental ability to earn and exchange ScienceCoins for goods and services within the ecosystem, or simply to exchange them for other cryptocurrencies or local fiat currencies, is a huge incentive for active participants and the purchasers of the ScienceCoins token.

Voting Rights

Holders of ScienceCoins are granted voting rights within Open Therapeutics. These include:

- 1) Annual conference location, agenda, and speakers.
- 2) Certain new features of the Therapoid platform.
- 3) Amendments to the Open Therapeutics LLC Agreement and/or Token Holders' Agreement where changes may adversely affect token holder's rights.

ScienceCoins™ Distribution

ScienceCoins will be provided to researchers in Open Therapeutics Therapoid platform as well as Knowbella Tech's Platform. In both cases, as shown in Table 1, the Companies will provide ScienceCoins to scientists ("Users") for collaborating in the research ecosystem. Since Open Therapeutics exclusively licensed Therapoid to Knowbella

Tech, LLC, it is in Open Therapeutics' best interest to support the non-therapeutic aspect of scientific intellectual property crowdsourcing.

Incentive Plan for Scientists²⁶

Prior to Launch: In order to accelerate scientific collaboration in Therapoid prior to the availability of ScienceCoins, we may offer loyalty points for milestones and collaboration.

Post Launch: After ScienceCoins token availability, these loyalty points will be exchanged for ScienceCoins. By having pre-existing scientists as loyalty point holders, a liquid token market is pre-positioned. ScienceCoins in turn can be converted into fiat or other cryptocurrencies (Bitcoin, Ether, etc.) by 3rd-party licensed exchanges.

Open Therapeutics will provide early users (students, scientists, and citizen scientists) with a digital wallet and a deposit of ScienceCoins just for registering to join the platform. Registration is free, and will default to the use of ORCID²⁷, a persistent digital identifier, which is emerging as the de facto standard for contributor identification in research and academic publishing. Additional ScienceCoins are awarded for collaborations and tasks performed within the Therapoid platform. (See Table 1 for a sample distribution.)

ScienceCoins Awards Program

A healthy ScienceCoins ecosystem is paramount for Open Therapeutics, as is a thriving, collaborative exchange of scientific research data and innovation. To develop both, the Therapoid platform includes an ScienceCoins Incentive Award Program (see Table 1).

Some token-enabled projects have utilized the concept of blindly sending tokens to Ethereum addresses with a balance to quickly raise awareness and liquidity. While this “air-drop” concept is often successful in meeting these goals, this scattershot approach is seen as inefficient in that many of the recipient addresses are inactive or their owners are completely unaware, or uninterested in the received tokens and their utility.

To improve upon this in a more focused manner, Therapoid platform's Awards Program creates liquidity and token awareness but directly with our audience: the scientific community. And, by managing the ScienceCoins awards menu carefully, Open Therapeutics will focus its users' attention to the specific areas or features of its choosing to rapidly develop a thriving community within each component of the platform. Regular updates to the Token Award Menu also allow Open Therapeutics to adjust the value of awards to reflect changes in the market price of ScienceCoins.

The ScienceCoins award program will also help promote the network effect. As scientists collect ScienceCoins, in their own best interest they will promote the use of the Therapoid platform and the purchase of ScienceCoins.

Activity	ScienceCoins
Registration via ORCID	4.00
Profile is completed	4.00
Registration for Hypothes.is (Annotations) account	2.00

Getting five new registrants (referral)	8.00
Joining a scientific group	2.00
Actively participating on a manuscript as a co-author	3.00
Serving as AuthorAID mentor or service user	2.00
Registering at Overleaf	2.00
Registering at Centers for Advancing Innovation (CAI)	2.00
Uploading data in community accepted format	5.00
Serving as a peer reviewer	2.00
Uploading a manuscript to the preprint server	10.00
Preprint is published in a journal	2.50
Donating a working piece of lab equipment	10.00
Donating consumables	3.00
Applying for a grant	1.00
Achieve top three finalists of grant selection	2.00
Submit a highly rated, but unfunded grant, to OnPAR	2.00
Register with our partner F1000	1.00
Participate reviewing a grant proposal	2.50
Issuing an RFP with funding greater than \$1000.00 USD (Other)	20.00
Providing acceptable open technology	5.00
Creating a new project that gains more than 3 members	2.50
Posting in forums (collaboration)	1.00
Posting or starting a "hot topic"	1.00
Starting and providing educational content	10.00

Table 1: Sample ScienceCoins Incentive Award System for Early Scientific Users (subject to change).

Technical Solution & Platform Architecture

- 1) Based upon Ethereum blockchain
- 2) Stack: Django/Python web application running on Amazon Web Services (AWS)
- 3) 3rd party Integration partners:
 - a) ORCID™
 - b) Hypothes.is
 - c) doDOC®
 - d) ARTiFACTS®
 - e) AuthorAID
 - f) F1000
 - g) OnPar™
 - h) Overleaf
 - i) American Impact Capital Foundation™
 - j) Center for Advancing Innovation™
 - k) Others other confidential....

4) APIs: Automated IP on-boarding

Business Model

Our platform business model will provide a scientific ecosystem that attracts users and producers to interact and yield valuable data, analytics, and innovations. The “open” model has proven to be successful with other industries such as Red Hat® and Linux in open source computer programming. The Therapoid platform will be an open repository for IP (as Github® is with open source projects); and, as a platform, we match IP producers (inventors/authors) with IP consumers (researchers/scientists).

Once we have collected the users within the Therapoid platform, the Company seeks to (1) monetize data and analytics, (2) sell analytics to for-profit companies, (3) strategically select and further develop assets from the community, and (4) provide consulting and employment opportunities for the researchers.

Once we have attracted the global scientific community, additional business models and revenue streams will follow. Those revenue streams may include:

- Selling analytics and subscriptions to industries for human capital resources, marketing intelligence, and competitive intelligence decision-making support.
- Equipment and consumables advertising and sales commission.
- Private enterprise version (white label) collaboration platform based upon the Open Therapeutics Platform. This enables other organizations to use the Therapoid platform in their private environments.
- Incubate and spinout companies that use and promote ScienceCoins.
- Consulting services and supplemental R&D services to private industry.
- IP offices to create potential value for unused IP.
- Marketing non-unused IP for institutional technology transfer officers (TTOs).
- Hosting Innovation Challenges.

As blockchain technology is more broadly understood and accepted, Open Therapeutics will be well positioned to capitalize on new opportunities to create value and grow the company.

Projections

In order to generate revenues, the Therapoid platform must attract and keep scientific users. We intend to do this with a superior platform experience, open intellectual properties from institutions around the world, and ScienceCoins for economic network effect.

As a result of our efforts, we project the following scientific user growth (Chart 1):

Very Conservative User Projections

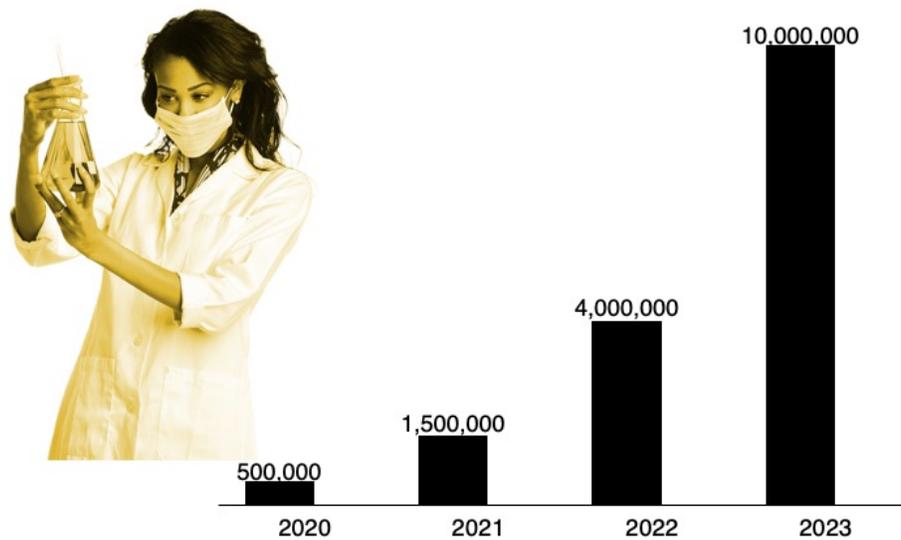


Chart 1: Conservative User Growth Projections.

Competitive Landscape

None provide cryptocurrency awards, unused IP, extensive tools, services, grant funding, and lab equipment:

- Research Gate® - Enables collaboration around post-published papers.
- Allied Minds® - IP commercialization. No collaboration platform.
- IP Group®: IP commercialization. No collaboration platform.
- Innoget® - innovation challenges for developing IP.
- Facebook® - social platform.
- LinkedIn®/Microsoft® - user biographical information.
- Redhat® - monetizing open technologies.
- GitHub® - hosts open source technologies.
- Biowebspin SA - scientific biographical information.
- Open Science Framework™ (OSF) - open science platform for manuscript development.

Addressable Market

The data and intelligence developed from users collaborating in the Therapoid platform would be valuable to numerous audiences, including:

- Pharmaceutical companies
- Governments
- Not-for-profits
- Synthetic biology firms
- Any organization with a research and development (R&D) function (looking for outside innovation)

Project Roadmap and Timeline

Company Development Timeline

- 1) January 2008: Microbial Robotics (formerly Bacterial Robotics) developing bench-level synthetic biology technologies is renamed Open Therapeutics.
- 2) Product development roadmap and timeline (Table 2):

Actions Required (phases)*	Priority 1	Priority 2	Priority 3	Priority 4
Development Timeline from alpha launch	30 days	180 days	240 days	360 days
Forecast of Users	300	5,000	10,000	450,000
	testers			
Revenues			X	X
version	alpha/beta	v1	v1.5	v2
Major platform milestones				
Stable, Secure, Scalable (3S)	X	X	X	X
Orphaned NSF listserv	X	X	X	X
UI/UX	X	X	X	X
Cryptocurrency awards for work (scientific proof of work) integration		X	X	X
Open source wallet		X	X	X
Further develop and onboard preprint servers from OSF/COS	X	X	X	X
Grant management blockchain development			X	X
Lab equipment management blockchain development			X	X
IP management on the blockchain			X	X
IP onboarding API			X	X
Integrate ARTiFACTS into message forums/boards & preprints (doDOC too?).		X	X	X
Recruitment dashboard for customers			X	X
Gig/job board		X	X	X
iOS mobile app		X	X	X
Android mobile app		X	X	X

utility ScienceCoins blockchain development and exchange listing		X	X	X
Knowbel non-fungible utility tokens			X	X
DOI and other publishing integrations			X	X
Company patent filings		X	X	X

* Priority phases:				
1	Launch Listserv. Onboard COS/OSF orphan preprint servers.			
2	Complete v1.0 of platform and launch it. Onboard 4,700 users. Gain revenues.			
3	Complete v1.5 platform. Gain revenues. Onboard 5,000 users.			
4	Complete v2.0 platform. Gain revenues. Onboard 450,000 users.			

3) June 2025: May seek to reverse merge the combined company into publicly traded company.

Corporate Development

Critically focused on:

1. Developing the team.
2. Developing the product (see timeline provided above). Open Therapeutics already has exclusive license with two pending U.S. patents for the Platform and blockchain grant-funding model.
3. Increase marketing to gain more scientific users.
4. Collect more IP.
5. Gain grant-funding partners.
6. Gain more surplus lab and instrumentation equipment from vendors to offer to the scientists for free, using their ScienceCoins for shipping, maintenance, etc.

Legal

Open Therapeutics has retained legal counsel with the ThompsonHine, PLL law firm, Cincinnati, Ohio. Intellectual property protections conducted by BakerHostetler.

This whitepaper is a “living document” and is not static. As a result, continuous updates should be expected. The reader should always gain the most-up-to version at <https://OpenTherapeutics.org>

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This document contains forward-looking statements that are based on Open Therapeutics's current understanding, expectations, and assumptions, which Open Therapeutics believes to be reasonable. These statements involve inherent risks and uncertainties, including those relating to our early stage of development, ability to attract users and grow our business, regulatory matters, and matters bearing on cryptocurrencies generally. These risks and uncertainties may cause actual results to differ materially from those expressed or implied by such forward-looking statements. You should not place undue reliance on such statements, and no representation is or can be made as to their attainability or accuracy.

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There are risks and uncertainties associated with Open Therapeutics and the Therapoid platform and its respective business and operations and the ScienceCoins token. For a full list of the risks and liabilities, refer to the full risk factors set forth in the Company's private placement memorandum or other offering documents.

No money or other consideration is being solicited in connected with this whitepaper, and if sent in response, will not be accepted. No offer to buy the securities can be accepted and no part of the purchase price can be received until the offering statement on Form 1-A is qualified pursuant to Regulation A of the Securities Act of 1933, as amended, and any such offer may be withdrawn or revoked, without obligation or commitment of any kind, at any time before notice of its acceptance is given after the qualification date. Any person's indication of interest involves no obligation or commitment of any kind.

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