

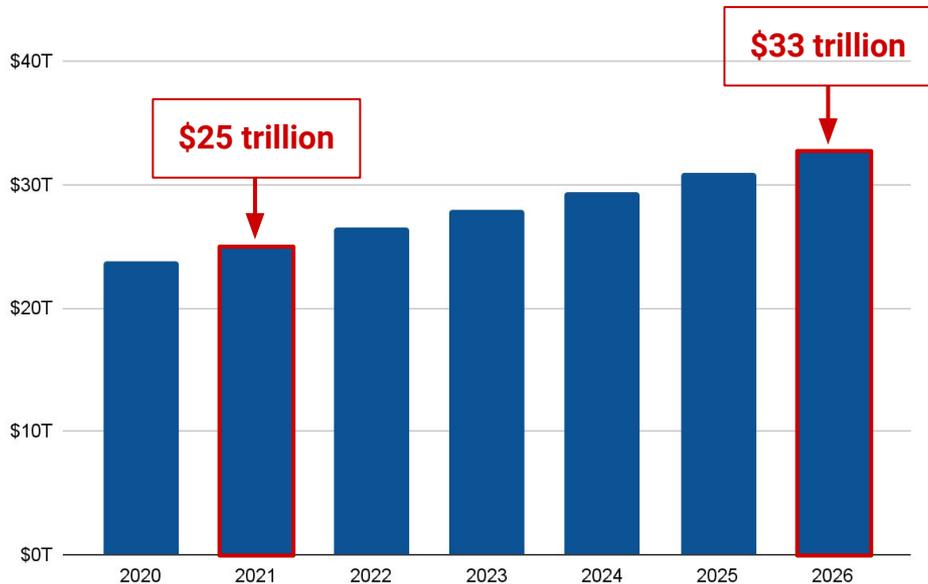
# Deep Knowledge Group

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## Longevity & AI Pharma Exchange Traded Fund



## World Longevity Economy Size Projections



Source: Longevity Investment Digest Q2 2021

The Longevity Industry has been growing actively in recent years and is projected to continue along a similar vector. This growth will be driven primarily by the oncoming “Silver Tsunami,” a demographic phenomenon that forecasts an increasing proportion of retired people in the global population in the coming decade.

The industry’s growth dynamics are depicted on the graph to the left, where the Longevity Economy’s size is forecasted. The industry valuation is comprised of the global healthcare spending budget (ca. \$9 trillion), the combined capitalisation of publicly listed Longevity companies (ca. \$6 trillion), the capitalisation of Longevity-related insurance and reinsurance companies, banks and pension funds (ca. \$9 trillion) and privately held Longevity companies (ca. \$1 trillion).

Deep Knowledge Group aims to both leverage, as well as facilitate the expansion of the Longevity Industry by constructing an analytical and financial infrastructure for the industry, its sub-sectors and the investors and companies operating within them. It is for these reasons Deep Knowledge Group developed a thematic Longevity & AI Pharma Exchange Traded Fund.

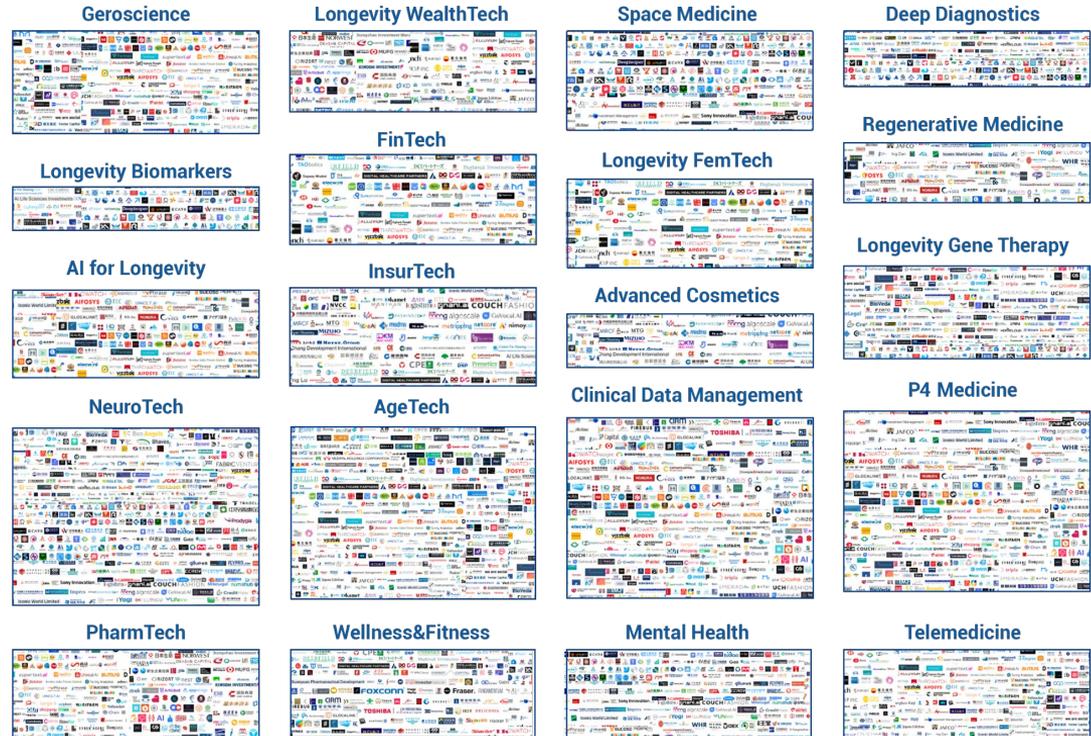
# Global Longevity Industry Landscape 2021

The entire global Longevity Industry was profiled by Aging Analytics Agency using its AI algorithms

With help of cutting edge tailor-made AI clustering and parsing algorithms, Aging Analytics Agency created a state of the art profile of the entire global Longevity Industry. The database includes:

- 23,000 Companies
- 9,500 Investors
- 1,000 R&D Hubs
- 20 Industry Sectors

Every sector comprises a number of different sub-sectors, creating a multilevel informational ecosystem of every part of the Longevity Industry.



[www.longevity.international/global-longevity-ecosystem](http://www.longevity.international/global-longevity-ecosystem)



**“The one billion retired people globally are a multi-trillion dollar opportunity for business”**

~ Dmitry Kaminskiy, [interview in the Financial Times](#)



**“The global spending power of those aged 60 and over will reach \$15 trillion annually by 2020”**

~ Bank of America Merrill Lynch



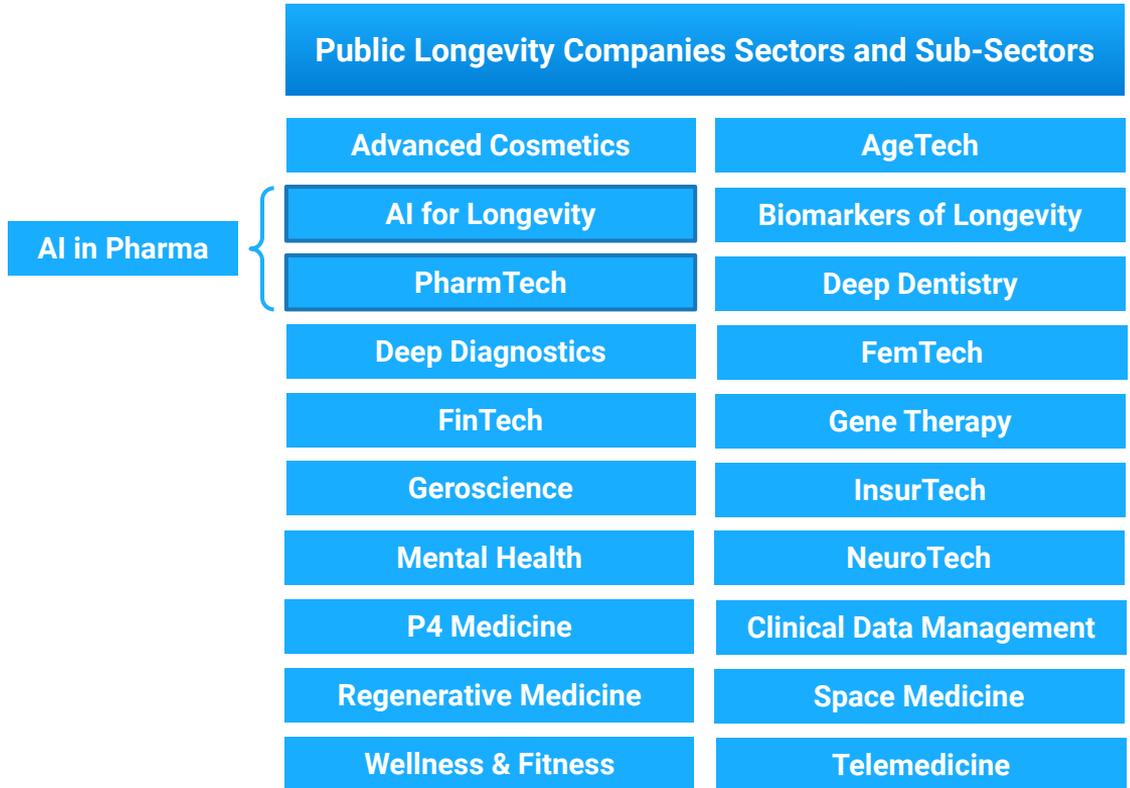
# Global Longevity Industry Landscape 2021

As mentioned previously, the Longevity Industry is comprised of an array of sub-sectors, which combine into a complex and multidimensional ecosystem that, in its purpose, serves to enable humans to live healthier for longer.

AI as applied in the Longevity and PharmTech sectors is a key constituent of the Longevity Industry that forms the AI in Pharma sub-sector.

AI as used in the Longevity and PharmTech sectors comprises approximately 10% of the value of the Longevity Industry (~\$2.3T), and is therefore an important component of the whole picture.

Deep Knowledge Group was the first to recognise the magnitude of the upcoming AI in Pharma trend. Deep Knowledge Group now sees similar dynamics in other parts of the Longevity Industry and is acting to capitalise on these trends.



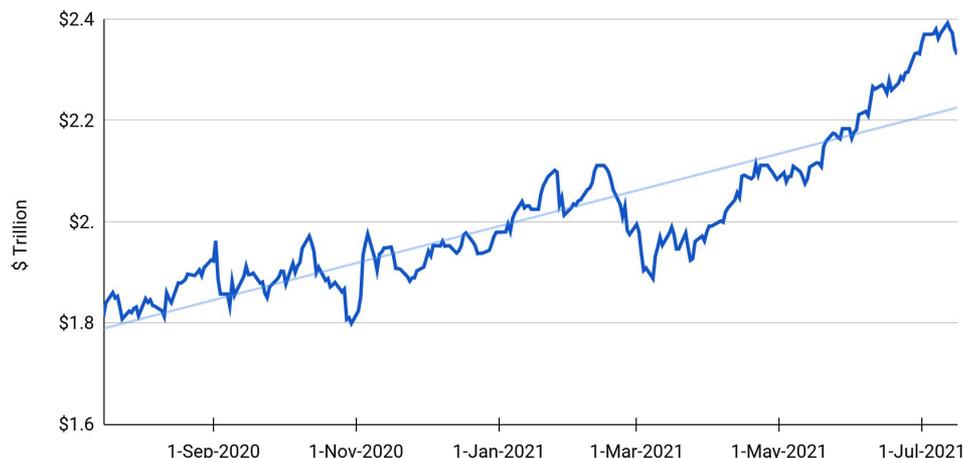
# AI-Pharma as the Core Sub-Sector of the Longevity Industry

**In order to facilitate the development of Artificial Intelligence in the Pharmaceutical Industry, we plan to launch an ETF that will reflect the performance dynamics of AI in Pharma in world markets**

We see significant potential for the application of Artificial Intelligence in the Pharmaceutical Industry. The expected Compound Annual Growth Rate for this market is projected to be around 40% over the next 3 years, making AI in Pharma one of the fastest-growing sub-sectors of the Longevity Industry.

Given the significant role the AI in Pharma sub-sector plays in the Longevity Industry as a whole, Deep Knowledge Group separated the field in this presentation. This was done in order to equip the reader with an understanding of the role AI in Pharma plays within the Longevity Industry as a whole and, by extension, the portfolio underlying the Longevity & AI Pharma Exchange Traded Fund.

Cumulative Capitalization of Publicly Traded AI in Pharma Companies, 2020-2021



Driven to some degree by the COVID-19 pandemic, publicly traded AI in Pharma companies demonstrated significant growth, reaching \$2.3T industry capitalization in July 2021.

In our view, COVID-19 will continue to push valuations and M&A activity in the sector because next generation technologies are required for fast and reliable R&D solutions.

# The Problem and the Solution

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## *Overview*

# Current state of Longevity Industry - Problem & Solution

## Problem



**Most businesses operating in the Longevity Industry use next-generation technologies, which are difficult for investors to underwrite in a qualified manner.**

In recent years, the emergence of the Longevity Industry has made itself known to both institutional and smaller-scale investors, however, many hurdles prohibit the sustainable allocation of capital to the industry. At Deep Knowledge Group, we believe that meaningful analytical and benchmarking tools resolve these problems and pave the way for providing the necessary financial infrastructure that will allow for the sphere to evolve in a sustainable fashion.

## Solution

In our view, the Longevity & AI Pharma Exchange Traded Fund (hereinafter the “Longevity ETF”) is one such way of redressing the aforementioned issues. The Longevity ETF will leverage Deep Knowledge Group’s sophisticated, AI-driven next generation analytical systems to create and actively manage a basket of public Longevity equities. Longevity ETF is liquid, has low entry costs (available to retail investors), provides opportunity to diversify across the entire spectrum of the Longevity Industry and entails relatively low operational expenses.

### Longevity & AI Pharma Exchange Traded Fund

Advanced AI-driven investment techniques	Operational optimisation
Risk reduction (diversification)	Expenditure optimisation
Low entry cost (retail investors)	Tax benefits
Highly liquid	Enhanced returns

The proprietary technology behind Longevity ETF is a collaboration between Deep Pharma Intelligence and Aging Analytics Agency, two subsidiaries of Deep Knowledge Group

**Deep Pharma Intelligence** is a strategic and investment intelligence agency focused on the Pharmaceutical, BioTech and HealthTech industries. Its expertise was used for profiling and analysing companies operating in the AI in Pharma Longevity sub-sector.

Over the course of the last four years, Deep Pharma Intelligence produced dozens of analytical reports on the Pharmaceutical Industry with a particular focus on how Artificial Intelligence is disrupting it. In May 2021, Deep Pharma Intelligence published “Artificial Intelligence in Drug Discovery: Focus on Oncology” with the aim of profiling an ecosystem of biotechnology companies and technology developers applying advanced data analytics and knowledge extraction technologies to disrupt Big Pharma.

The main goal of Deep Pharma Intelligence is to create a full cycle analytical and investment ecosystem for the Pharmaceutical Industry.



## Deep Pharma Intelligence focuses on three key activities:

Building a comprehensive big data analytics platform (SaaS) as a one-stop-shop for all market and business intelligence operations needed by clients

Producing regular open access and proprietary reports on the emerging topics and trends in the pharmaceutical and healthcare industries

Providing commercial services, including investment advisory and strategic business consulting in the areas of pharmaceuticals, biotechnology, medtech, and healthtech

# Deep Pharma Big Data Analytics Dashboard

Deep Pharma Intelligence Big Data Analytics Dashboard is a powerful tool for investors

Deep Pharma Intelligence Big Data Analytics Dashboard is one of the analytical platforms developed by the Deep Knowledge Group.

Its main goal is to provide Big Data-based analytical insights, as well as being a Pharma-focused database for institutional and non-institutional investors. It also allows creation of different types of investment portfolios and assesses them with built-in tools provided by the platform.



[www.dashboards.invest-solutions.finance/ai-for-drug-discovery/](http://www.dashboards.invest-solutions.finance/ai-for-drug-discovery/)

**Aging Analytics Agency** is a provider of analytics on the topics of Longevity, Precision and Preventive Medicine, the Economics of Aging and the convergence of technologies such as AI and blockchain in healthcare. It is the only analytical company focused exclusively on the topics of Aging, Geroscience and Longevity. Founded in 2013, with headquarters in London, United Kingdom and branches in Europe, the United States and Canada, it began producing in-depth reports on Longevity long before it emerged as an industry.

Aging Analytics Agency provides strategic consulting services in fields relating to Longevity, and currently serves as the primary source of analytics and data for the UK All-Party Parliamentary Group for Longevity. In 2014, **Aging Analytics Agency successfully predicted the Industry's development** and aggressive capital inflows that occurred in 2017-2018.

Aging Analytics Agency participated in the fundamental analysis of the Longevity ETF portfolio, e.g. drug pipeline analysis (where applicable), TRL and IRL assessments, etc. It also provided access to all Longevity-related databases and other informational infrastructure.



## Aging Analytics Agency focuses on three key activities:

Conducting customised case studies, research and analytics for internal use, as well as tailored options to meet the precise needs of specific clients.

Producing regular open access and proprietary analytical case studies on the emerging topics and trends in the Longevity Industry.

Offering customised analysis using specialised interactive industry and technology databases, IT-platforms and Big Data Analytics Dashboards.

# Longevity Investment Big Data Analytics Dashboard



Longevity Investment Big Data Analytics Dashboard is one of the analytical platforms developed by Deep Knowledge Group, dedicated to the Longevity Industry.

Its main goal is to provide Big Data-based analytical insights, as well as being a Longevity-focused database for institutional and non-institutional investors. It also allows for the creation of different types of investment portfolios and assesses them with built-in tools provided by the platform.

[www.dashboards.invest-solutions.finance/longevity-investment](http://www.dashboards.invest-solutions.finance/longevity-investment)

# Deep Knowledge Group

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## Investment Track Record



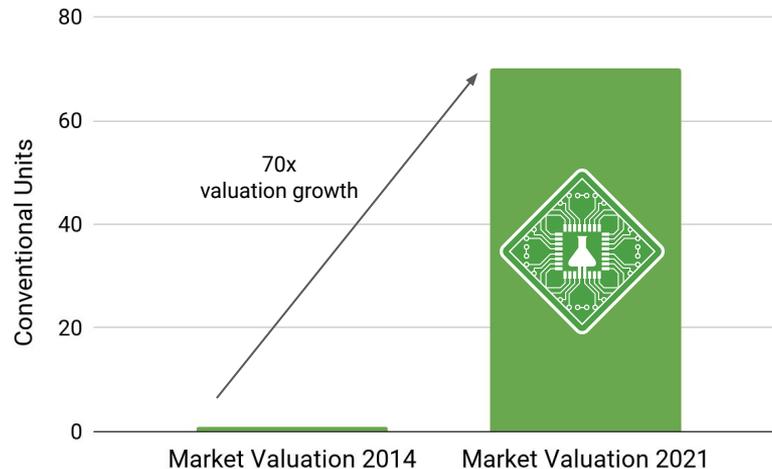
# Insilico Medicine Valuation Growth Since Deep Knowledge Group's Investment

**In 2014 Insilico Medicine was a little-known biotech startup that suggested a computational alternative to animal testing for research and development programs in the Pharmaceutical Industry by using artificial intelligence.**

Deep Knowledge Group was one of the first investors who put their attention on the AI in Pharma sector. We foresaw the potential of Insilico Medicine's idea at the dawn of the industry, 4 years before the concept of AI in Pharma existed as an investable industry for institutional investors.

In 2018, Insilico Medicine succeeded in conducting groundbreaking scientific research on the design of a novel drug by AI in just 21 days, and preclinical validation just 25 days thereafter. In 2019, Insilico Medicine successfully conducted a Series B funding round, which secured the company \$37 million. In 2021, Insilico Medicine announced a \$255 million Series C funding round with Warburg Pincus as lead investor. This deal is evidence that the company's AI-based platform can create a new target for a disease, develop a bespoke molecule to address it and bring it through the clinical trial process at a fraction of the cost of traditional approaches in the Pharmaceutical Industry. Insilico has become one of the most high-profile companies in the Pharmaceutical Industry on a new market that was spawned and inspired by it.

**Insilico Medicine Valuation Dynamic  
2014 vs. 2021**



**Insilico Medicine's valuation has grown 70x in 7 years, showing remarkable growth, especially for a company operating on the frontier of the drug development industry**

[www.aginganalytics.com/investment-digest](http://www.aginganalytics.com/investment-digest)

## Deep Knowledge Group was first to invest in Insilico Medicine



英科智能  
Insilico Medicine

2014 Seed and Convertible Notes	2018 Round A	2019 Round B	2021 Round C	2022-2023 IPO
	<b>\$13M</b>	<b>\$37M</b>	<b>\$255M</b>	
 <p><b>DEEP KNOWLEDGE VENTURES</b></p> <p>Insilico Medicine is an artificial intelligence company headquartered in Hong Kong, which pioneered the applications of the generative adversarial networks (GANs), reinforcement learning, transfer learning and meta-learning for the generation of novel molecular structures for diseases with known and unknown targets.</p>	 <p><b>WuXi AppTec</b></p>  <p><b>JUVENESCENCE</b></p>  <p><b>TEMASEK HOLDINGS</b></p>  <p><b>BOLD CAPITAL PARTNERS</b></p>	 <p><b>QIMING VENTURE PARTNERS</b></p>  <p><b>SINOVIATION VENTURES</b></p>  <p><b>Oculus</b></p>  <p><b>TEMASEK HOLDINGS</b></p>  <p><b>LONGEVITY VISION FUND</b></p>  <p><b>Baidu.ventures</b> 百度风投</p>  <p><b>JUVENESCENCE</b></p>  <p><b>8° EIGHT ROADS™</b></p>  <p><b>Lilly Asia Ventures</b></p>  <p><b>F-PRIME</b></p>  <p><b>BOLD CAPITAL PARTNERS</b></p>	 <p><b>WARBURG PINCUS</b></p>  <p><b>LAKE BLEU CAPITAL</b> 清池资本</p>  <p><b>PAVILION CAPITAL</b></p>  <p><b>B Capital Group</b></p>  <p><b>Lilly Asia Ventures</b></p>  <p><b>Maison Capital</b> 麦星投资</p>  <p><b>8° EIGHT ROADS™</b></p>  <p><b>OrbiMed</b> Healthcare Fund Management</p>  <p><b>Baidu.ventures</b> 百度风投</p>  <p><b>QIMING VENTURE PARTNERS</b></p>  <p><b>FORMIC VENTURES</b></p>	<p><b>IPO planned for 2022</b></p>

# Our AI and Data Science Technologies for Advanced Analytics

The technologies (AI & ML algorithms, data aggregation, mathematical transformations) that are applied for each of our products are listed below.

## Data Aggregation

Data extrapolation through regressions

Data extrapolation through deep neural networks

Natural language processing for tag cloud creation

Data parsing

Deep neural networks for data structuring

## SWOT Analysis

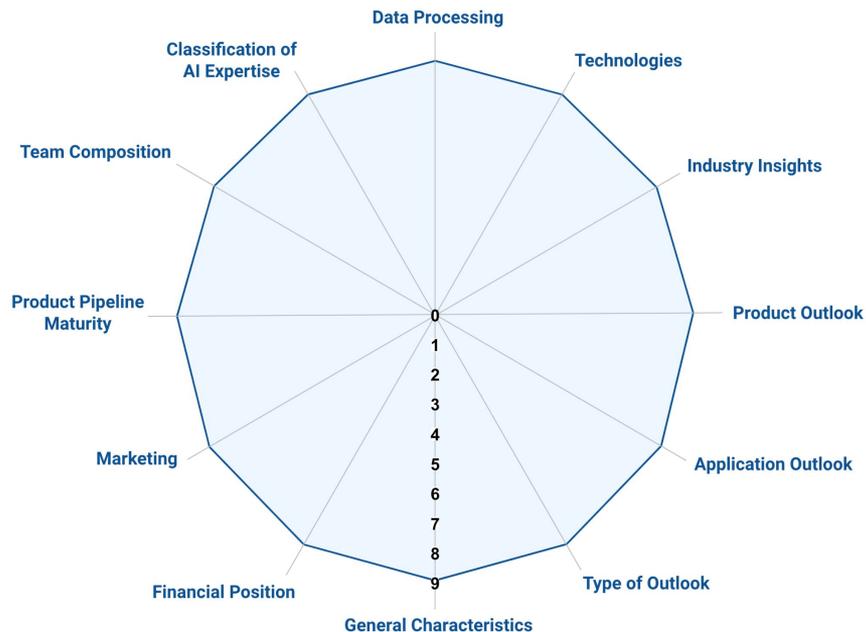
Polynomial formulas, multidimensional vector spaces

Mathematical transformations: logarithmic, exponential, parabolic, multiplicative

Business development harmonisation analysis: definite integrals, standard deviation

Variance-covariance analysis of company parameters

Linear algebra



# Our AI and Data Science Technologies for Advanced Analytics

The technologies (AI & ML algorithms, data aggregation, mathematical transformations) that are applied for each of our products are further described below.

## Forecasting

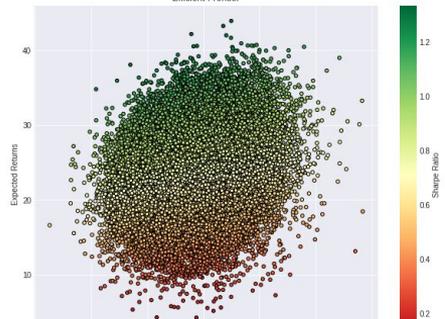
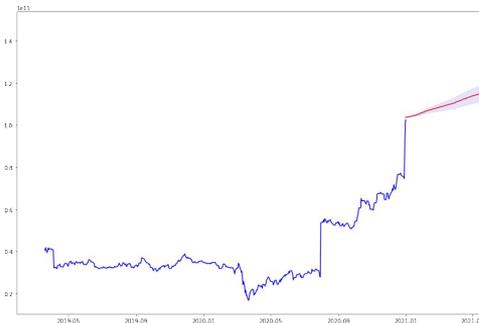
Neural networks with LSTM layers for time series data analysis

Recurrent neural networks to extract complex hidden connections from the data

Brownian motion modelling for stock market forecasts

GARCH model

Real option analysis, scenario planning



## Clusterization and competitor analysis

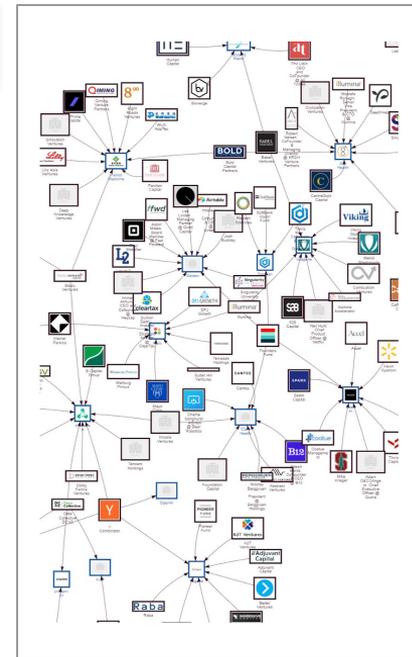
Unsupervised machine learning for company clustering

K-Means algorithm for company clustering

Calculation of the distance between companies in multidimensional space

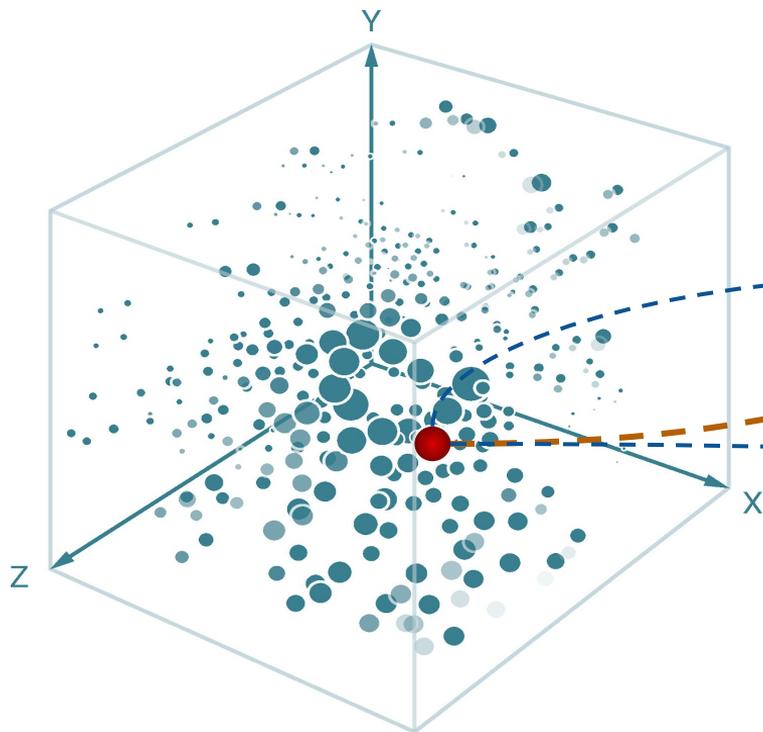
Convolutional neural networks for identification of companies with similar patterns

Using tag clouds to categorize companies

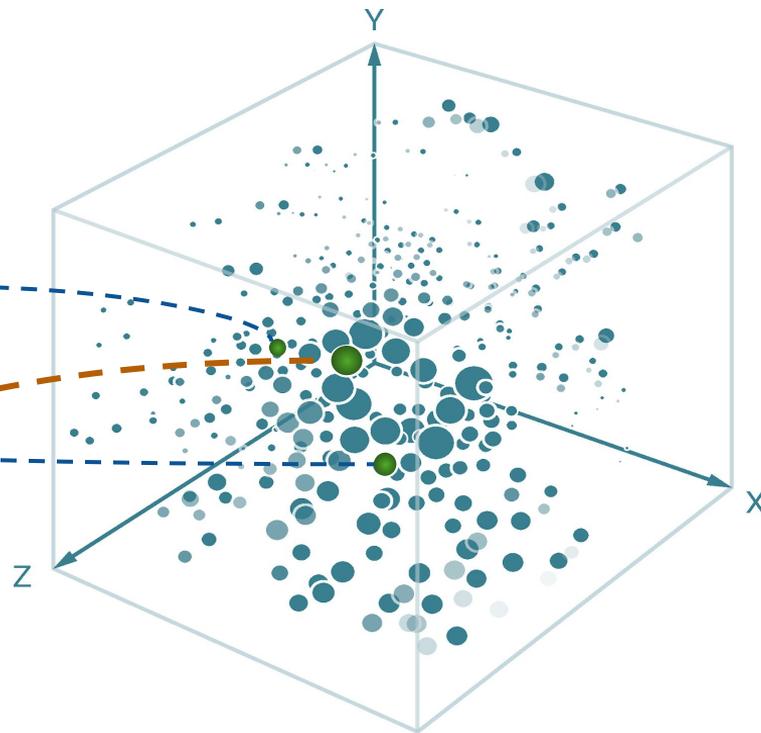


# Multidimensional Vector Space in AI Analytics

Investors Industry Universe



Companies Industry Universe

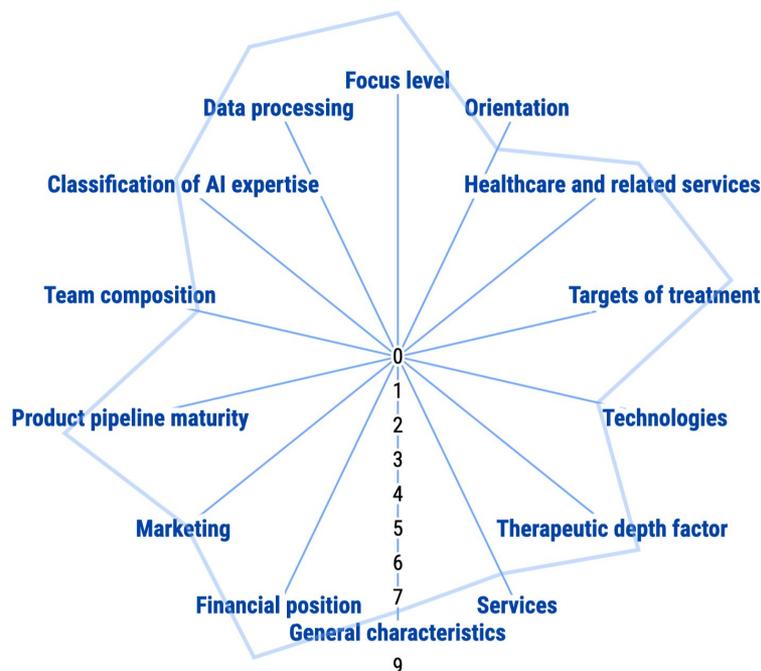
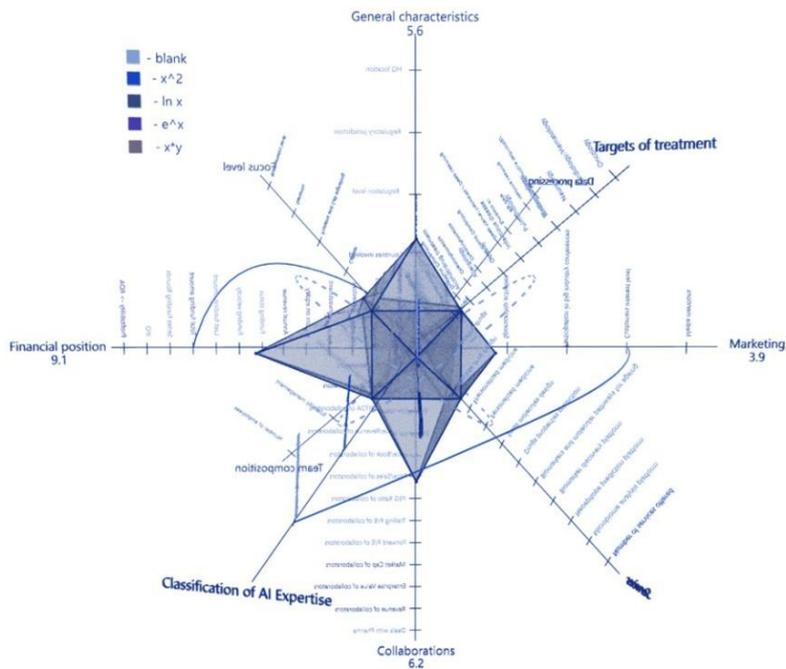


The system enables targeted and intelligent smart-matching between investors and portfolio candidates based on specified sectors and qualifying criteria (e.g. highly-targeted quantified ratios of rankings in specific areas).

# Multiparametric Automated SWOT Analysis

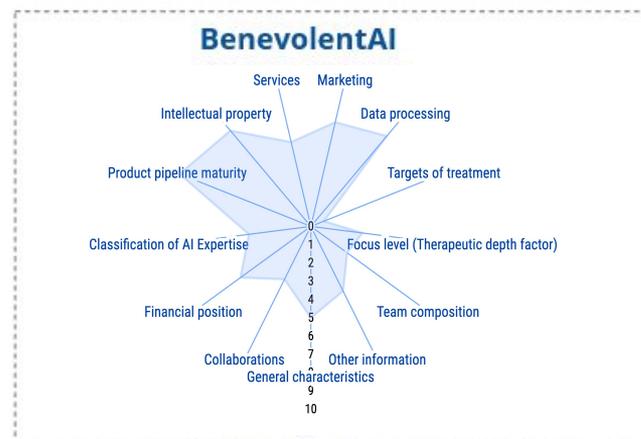
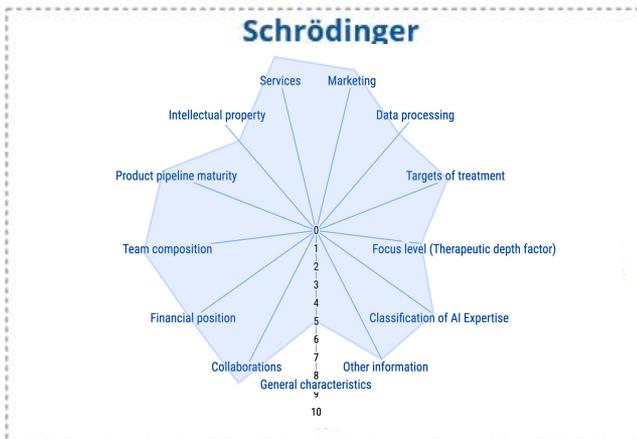
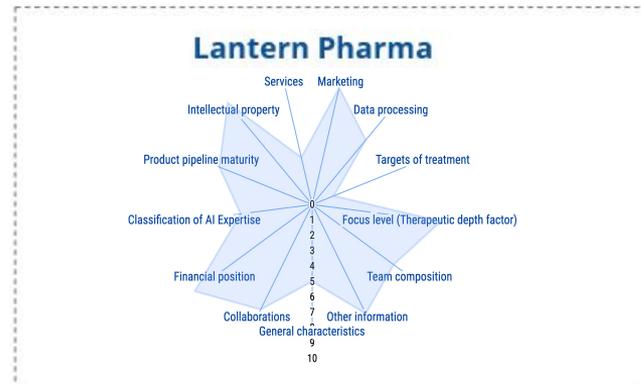
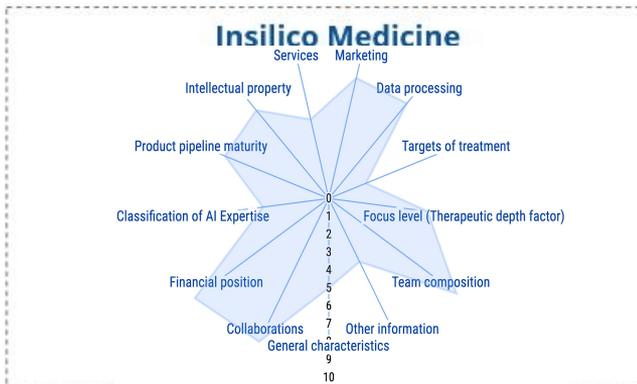
Deep Pharma Intelligence offers a state-of-the-art interactive online AI-based **SWOT analysis system** covering most companies and investors in the AI-in-Pharma industry.

The product allows the companies to conduct initial data-driven due diligence **instantly, automatically and holistically** by comparing multiple parameters for each company combined in the 12 vectors of R&D and business development. The results of the analysis are represented in easily perceived 2-dimensional and 3-dimensional radar chart form.



# Our Proprietary Algorithmic Analytics for Automated Multiparametric Comparative and SWOT Analysis

Based on hundreds of parameters, we created a profound multidimensional real-time online SWOT analysis system. It allows us to analyse and predict a given company's future development and the obstacles they might face, capturing hidden connections via AI algorithms.



# Longevity Publicly Traded Companies

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## *Overview*

## Longevity Recent IPO Funding Distribution

The graphs to the right depict the last and total Funding amounts of the Longevity companies that recently raised equity in the public market.

The cumulative amount of last funding rounds is **\$2.2B**.

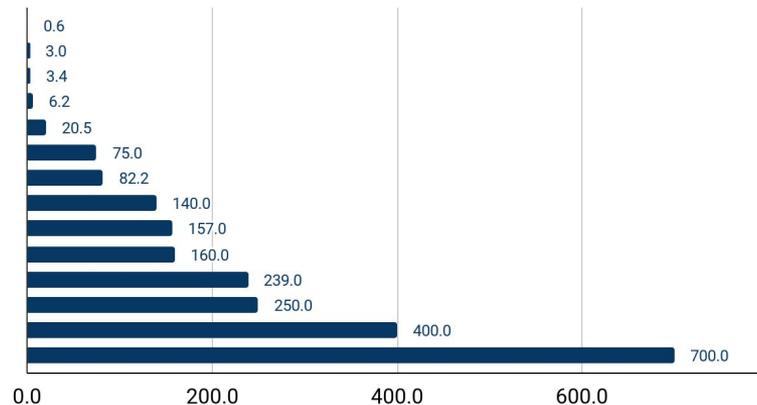
The cumulative amount of total funding is almost **\$8.0B**.

As can be seen from the graphs, the funding amounts vary significantly across companies, which indicates that companies of various sizes were able to successfully list their shares.

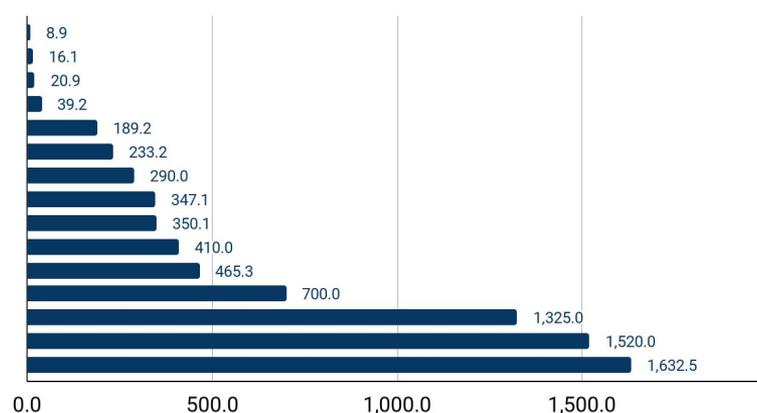
At Deep Knowledge Group, we believe that the IPO dynamics depicted to the right will continue in a similar fashion in the upcoming years.

We expect that the number of companies with comparatively large total funding amounts will increase due to the exponential nature of the growth in relevance of the products and services they utilise to increase output while simultaneously reducing costs.

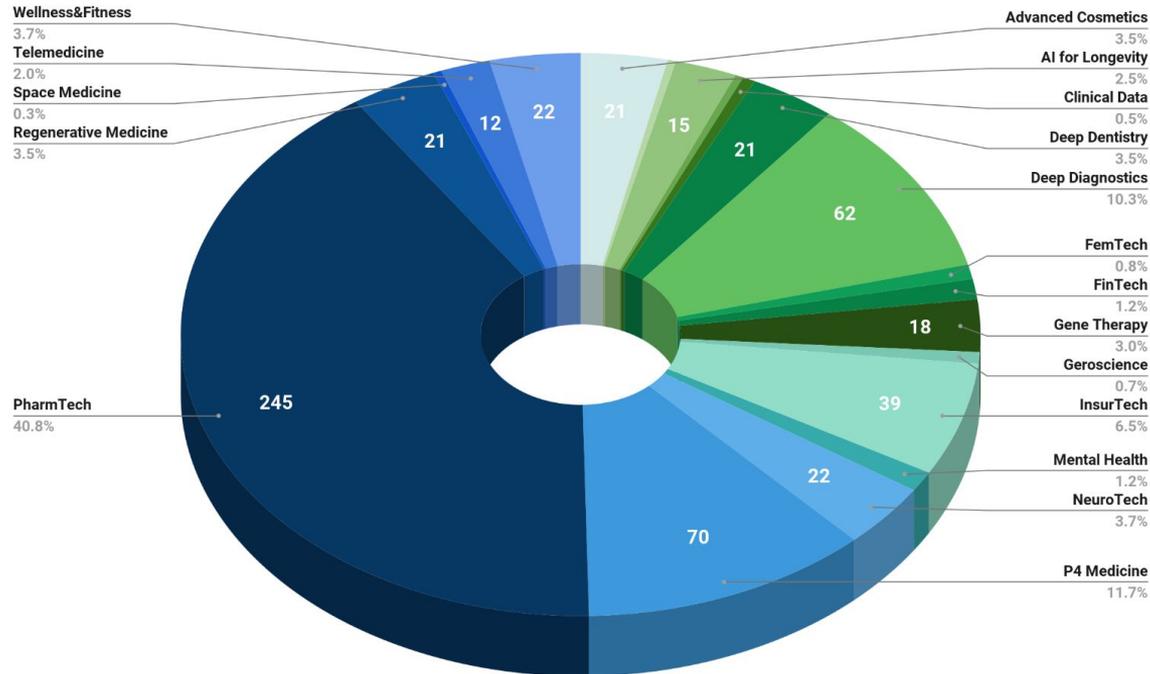
Longevity Recent IPO Companies Last Funding Amount Distribution, \$M



Longevity Recent IPO Companies Total Funding Amount Distribution, \$M



Longevity Public Companies by Sub-sectors



Deep Pharma Intelligence and Aging Analytics Agency profiled 600 public companies in order to create a comprehensive and inclusive outlook of the Longevity Industry on the stock markets. The pie-chart on the left depicts the sectors and sub-sectors to which the companies belong.

As can be seen, the outlook comprises 20 different sectors and sub-sectors. The largest proportion of the companies (roughly 43%) is included in the AI in Pharma sector, which clearly shows the importance this area has for the Longevity Industry.

In this list, FinTech is one of the least populated sectors, however, in our view, this it will deliver the strongest impact the Longevity Industry by providing it with feasible financial solutions.

This asymmetry led us to the creation of new, ecosystemic FinTech product for the Longevity Industry – **Longevity Card**.

[www.longevity.cards](http://www.longevity.cards)

# Deep Knowledge AI in Pharma & Longevity ETF

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## *Overview*

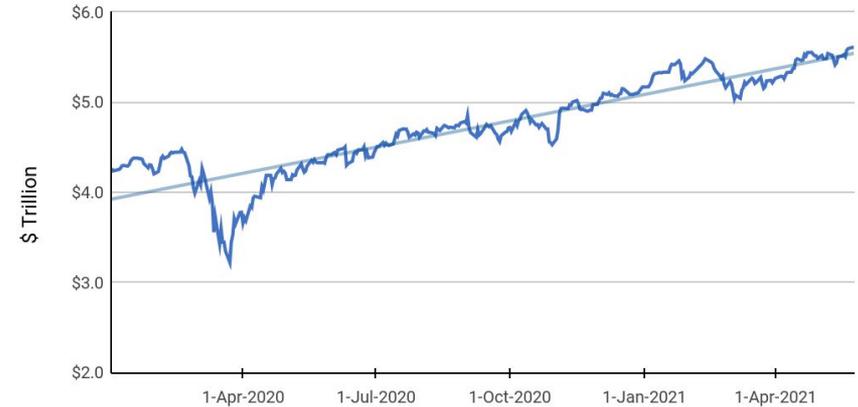
# Rationale for Deep Knowledge AI in Pharma & Longevity ETF

**We are launching Deep Knowledge AI in Pharma & Longevity ETF, which is tied to a basket of publicly traded Longevity companies**

Currently, the growth rate of the Longevity Industry is comparable to that of the IT sector. Longevity is regularly picked as a major topic of interest for panel discussions and entire conference series by top-tier finance and business media brands, including The Economist, the Financial Times and Bloomberg.

**Longevity ETF** will consist of a basket of up to **600** publicly traded companies, including but not limited to: Big Pharma and AI in Pharma companies, as well as companies participating in the Aging Healthcare industry, aging-related chemical and manufacturing companies, IT companies that provide technological solutions for aging-related sectors and others. This approach allows us to create a holistic profile of the Longevity Industry and include all of its sub-sectors and sub-industries. We thus create a parameterised ecosystem, quantify its performance dynamics and understand the correlations within it. It is on this basis that we analyse the convolutional effects that emerge in this industry and it is also the key that allows us to benefit from the Industry's multidimensionality (by way of diversification).

Cumulative Capitalization Dynamics of Top Publicly Traded Longevity Companies, 2020-2021



The 600 publicly traded Longevity companies that made our list experienced growth from **\$4.3T** to **\$5.6T** of cumulative capitalisation, representing **30.2% growth** y-o-y from January 2020 to June 2021. As can be seen, the Industry's growth is linear and without significant turbulence, except for a downturn Q1-Q2 2020 that was witnessed in the Longevity and Pharma Industries.

# Exchange Traded Fund

Type	Description	Pros	Cons
<b>Diversified passive equity ETFs</b>	Designed to mirror the performance of widely followed stock market benchmarks such as the S&P 500, the Dow Jones Industrial Average, and the MSCI Europe Australasia Far East (EAFE) indices.	<ul style="list-style-type: none"> <li>• Lower expense ratios</li> <li>• Increased transparency</li> <li>• Greater tax efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Are subject to total market risk</li> <li>• Lack of flexibility</li> <li>• Heavily-weighted to the highest valued stocks in terms of market cap</li> </ul>
<b>Niche passive equity ETFs</b>	Reflect subsets of the S&P 500 sectors or small Russell 2,000 companies. Provide investors opportunity to refine strategy.	<ul style="list-style-type: none"> <li>• Able to carve out a definable, narrow focus</li> <li>• Captures interesting societal or technological trends</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of a track record due to novelty</li> <li>• Higher risk due to narrow specialization</li> </ul>
<b>Active equity ETFs</b>	Allow using own judgments when choosing a strategy, rather than tying to a base index. May carry greater risk and higher costs.	<ul style="list-style-type: none"> <li>• Comparatively high returns</li> <li>• Variety of investment strategies</li> <li>• Might significantly outperform market even during the crisis</li> </ul>	<ul style="list-style-type: none"> <li>• Investment techniques might be incoherent</li> <li>• Comparatively higher risks</li> </ul>
<b>Fixed-income ETFs</b>	Focused on bonds rather than stocks.	<ul style="list-style-type: none"> <li>• Portfolios with low volatility</li> <li>• Market stiffness</li> </ul>	<ul style="list-style-type: none"> <li>• Low returns</li> <li>• Inflexible operational structure</li> </ul>

# Longevity Equities Basket

**The Longevity Equities Basket** was created using a combination of AI clustering algorithms, technical and fundamental analyses. In profiling the Longevity Industry, we analyzed in excess of 23,000 companies and included 619 companies in our calculations. All of these 619 companies can be described as longevity-focused or implementing AI solutions in the Pharmaceutical Industry. The cumulative capitalisation of these 619 companies is \$4.5 trillion. The largest companies in our portfolios are **UnitedHealth Group Inc. (NYSE: UNH)**, **NVIDIA Corporation (NASDAQ:NVDA)** and **Roche Holding AG (SWX: RO)**.

The list of companies was subsequently arranged and organised into groups based on market features. This exercise yielded 5 different sets of companies. These sets were then nicknamed and treated as individual portfolios.

## Longevity Portfolio Sub-Sectors

**TOP by Market Capitalization** – this is a widely-used investment parameter, indicating the size of the company by way of its market valuation.

**Promising companies** – promising companies tend to generate the highest returns, these companies also tend to have high volatility and low market caps.

**CJ+** – a set of the best companies according to the modified Cowles-Jones coefficient. Mostly growth stocks.

**Stabilizers** – big, well-known companies with great market performance. This set is considered to be the most reliable and suitable for risk-averse investors.

**Performers** – companies of considerable size with good financial performance, pipelines and market strategies. These companies have big market share-growth potential.

# Longevity ETF Simulated Performance

The graph to the right depicts the cumulative returns generated by our safest investment strategy (the one with minimal variance). This particular equities basket generated **77.7%** return in the period between August 25, 2020 and May 17, 2021. This performance was made possible due to the following:

- Use of AI-based clustering algorithms and parsing techniques for data aggregation, generating a list of 23,000 longevity-related companies
- Use of Aging Analytics Agency and Deep Pharma Intelligence's proprietary databases that include companies, investors, financial data, and other information
- A number of fundamental and technical analysis strategies for portfolio creation, including Ratios, DFA, X11, advanced mathematical programming, among others
- Companies weights were adjusted according to Modern Portfolio Theory with additional optimisation techniques based on Time Series Analysis and advanced constraints optimisation theory

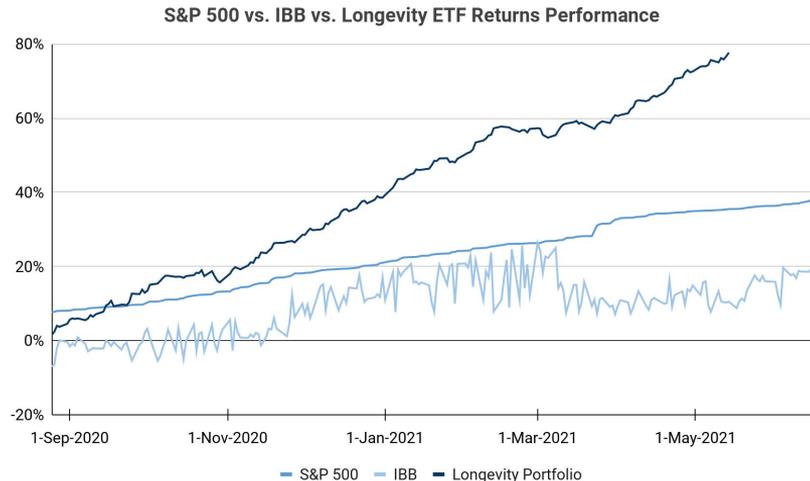


<b>Portfolio</b>	<b>Minimum Variance</b>
<b>9 months performance</b>	<b>77.7%</b>
<b>Max return</b>	<b>77.7%</b>
<b>Portfolio standard deviation</b>	<b>0.7%</b>
<b>Skewness</b>	<b>-0.18</b>
<b>Kurtosis</b>	<b>0.07</b>

## Longevity Index vs. Other Indices

The Longevity Industry is relatively volatile (as measured by standard deviation), however, growth in the market capitalisation of longevity-focused companies far exceeds that of the S&P 500 and the iShares Biotechnology ETF (hereinafter the “IBB”). The table below shows that **average daily returns of our Longevity ETF** during the tracked period 2020-2021 are **4.0x higher** as compared with benchmark indices while simultaneously demonstrating significantly lower average daily volatility. This implies that the companies we selected demonstrated more stable, higher returns. Of the comparables below, the Longevity ETF’s skewness is closest to zero, which is characteristic of a normal distribution, indicating more predictable performance as compared to other indices.

Index	Correlation with Longevity ETF	Av. daily return 2020/2021	Av. daily volatility 2020/2021	Skewness	Kurtosis
<b>Longevity ETF</b>	-	0.41%	0.72	-0.18	0.07
<b>iShares Biotechnology ETF (IBB)</b>	0.33	0.07%	1.56	-0.20	0.08
<b>S&amp;P 500</b>	0.39	0.10%	1.05	-0.69	1.11



The portfolio’s near-zero kurtosis indicates low probability of the occurrence of extreme values in the returns distribution.

This fact, coupled with the portfolio’s low volatility as compared to other indices, suggests that the Longevity portfolio may be a good choice for risk-averse investors.

## Overall Performance / Performance Matrix

This is a brief performance matrix of all our portfolios with different investment strategies. A darker shade represents better performance, the red colour marks the portfolio we chose:

Return	Equally Weighted	Minimum Variance	Market Cap	Sharpe
TOP by Market Capitalization	13.4%	11.2%	11.4%	42.7%
Stabilizers	26.3%	14.8%	17.7%	46.9%
Promising Companies	90.3%	77.7%	74.4%	96.0%
Performers	39.7%	26.4%	37.9%	60.3%
CJ+	42.6%	41.8%	15.6%	75.1%

# AI in Pharma Longevity Sub-Sector

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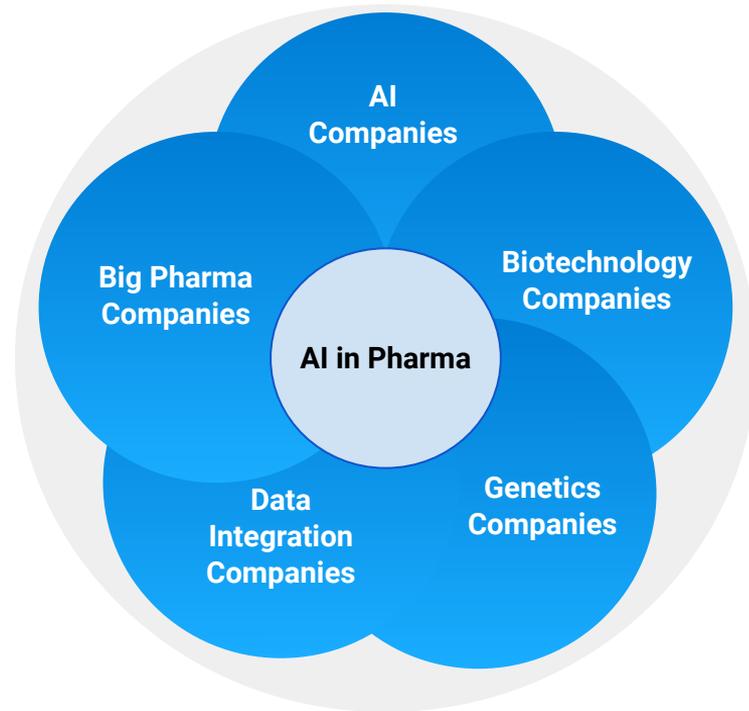
## *Overview*

# AI in Pharma Longevity Sector

**The AI in Pharma sector is one of the most important across the whole Longevity Industry.** Defined broadly, the AI in Pharma sector is not limited to AI companies, but includes also pharma companies, technology companies, chemistry corporations and CROs that are engaged in collaborations with AI startups, including but not limited to: mergers & acquisitions, scientific research partnerships and others. Therefore, the AI in Pharma sector cannot be reduced to AI-driven companies only.

The number of new partnerships between pharma companies and AI companies is increasing across the whole industry. AI-focused companies specialise in the development of appropriate software and tools which pharma companies do not have, while pharma companies, on the other hand, understand science, possess extensive experience in the industry, know the regulatory environments and have shown a willingness to share in exchange for AI-expertise.

On the following slides a brief outlook on the AI in Pharma sector is presented.

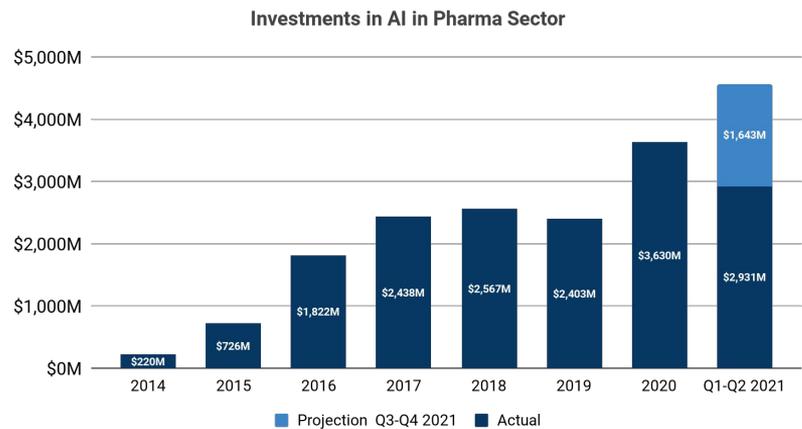


## AI in Pharma Longevity Sub-Sector / Investment Dynamics

Among the flourishing variety of the Longevity Industry's sub-sectors, the AI in Pharma sub-sector stands out as one of the most rapidly growing and conceptually important. AI in Pharma's power to disrupt is rooted in the profound technologies being created and developed in this sector, which provide opportunity to revolutionise time-consuming and costly scientific and business processes.

It is this revolutionary potential, coupled with the COVID-19 pandemic, that has driven the substantial shift in Big Pharma's interest in AI technology from "nice to try" to "strategically important," and the resultant influx of capital being invested into AI-driven Pharma companies since 2014. Over the course of the last 6 years, annualised investments have increased five-fold (from **\$220M** to **\$2.9B** as at June 2021). Most notably: in 2020, investment inflow increased by **51%** y-o-y. We believe this is due to the COVID-19 pandemic. These factors have contributed to the growing awareness of the Longevity Industry throughout technologically advanced countries.

2021 showed several significant financing rounds successfully closed by AI in Pharma companies, which can be seen in the graph to the right.



# Top 10 AI-Driven Publicly Traded Pharma Companies

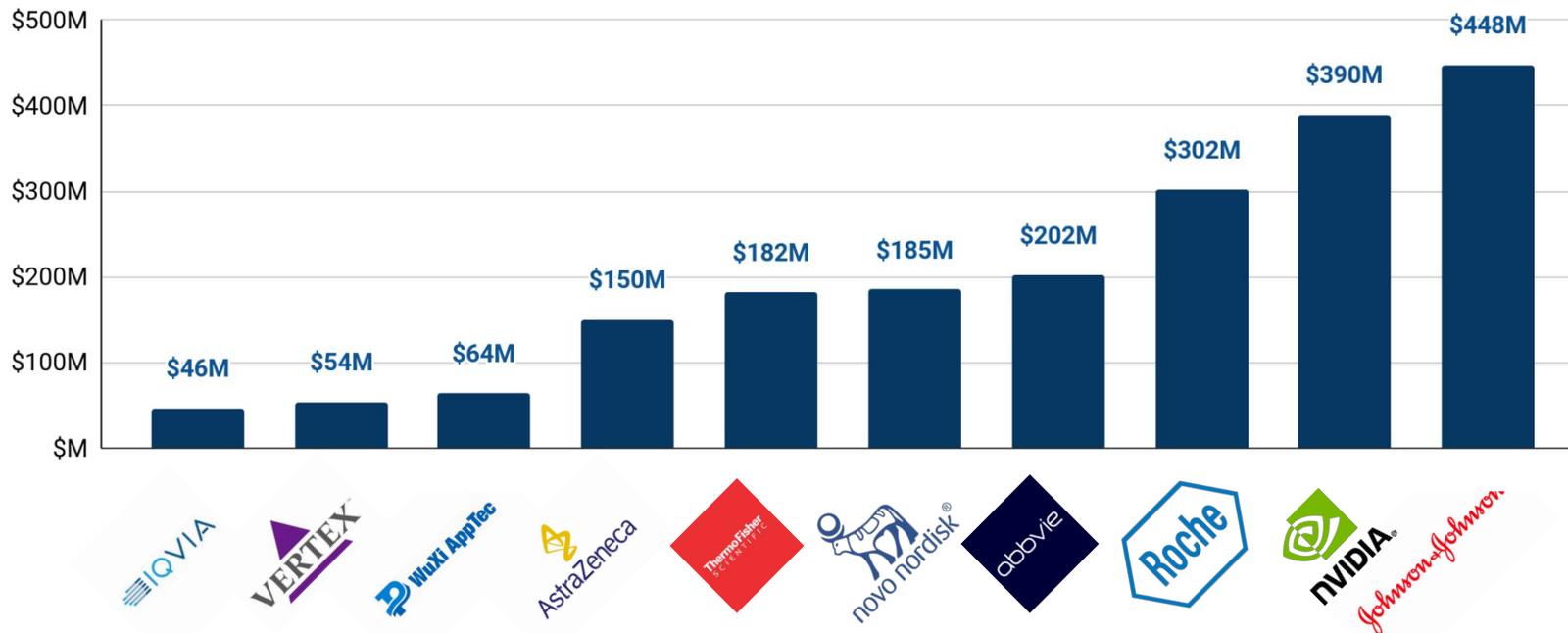
## Top-10 AI-Driven Publicly Traded Pharma Companies by Market Capitalization in 2021



The chart presents the top 10 AI-driven drug discovery public companies sorted by market capitalization as of end of June 2021. Recursion Pharmaceuticals is the leader of the ranking, the company successfully closed an IPO in April 2021 after reaching a deal with Bayer AG in September 2020 for implementing AI for drug development in the area of lung fibrosis and other fibrotic diseases. Schrödinger remains a leader life sciences technology company. Another leader of this graph, Relay Therapeutics, also announced the closing of an IPO in 2021 and raised \$400M.

# Top 10 Publicly Traded AI-Pharma Related Companies

Top 10 Publicly Traded AI-Pharma Related Companies by Market Capitalization in 2021



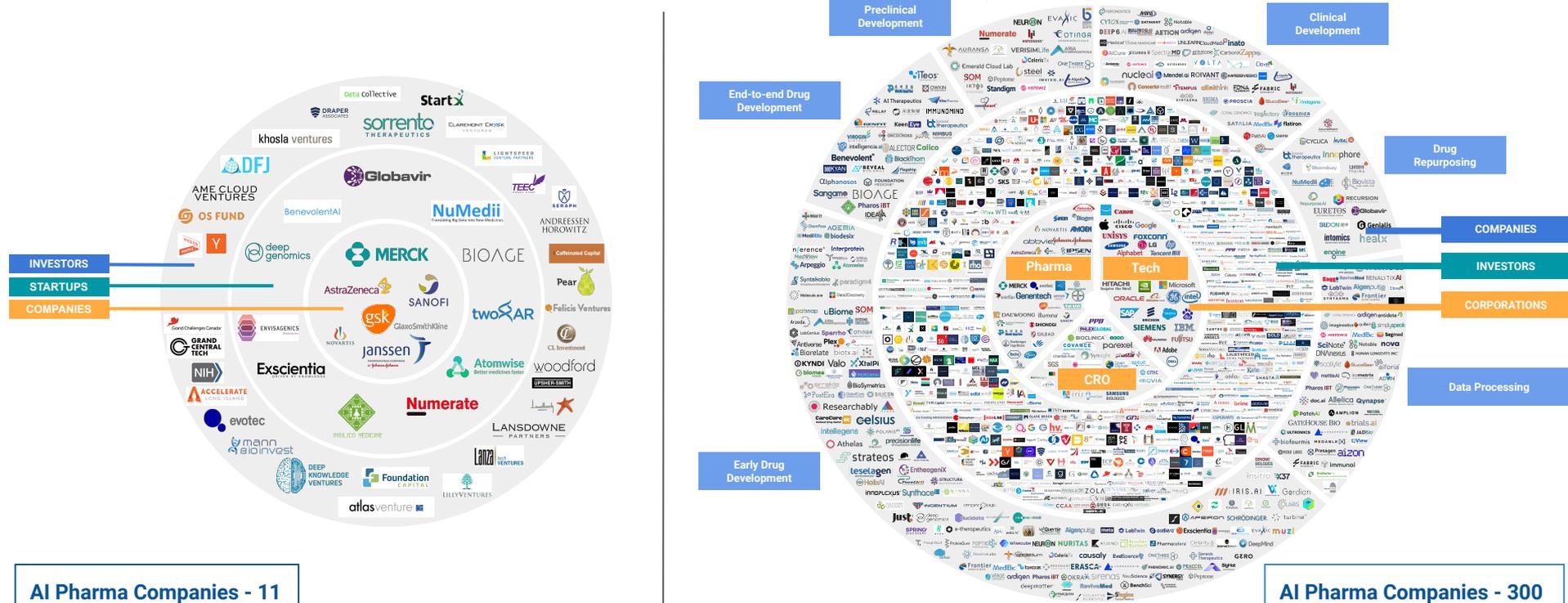
The chart represents top 10 public companies that ended up in our portfolios according to their market capitalization (as of end May of 2021). Johnson & Johnson, Roche Holdings and NVIDIA top our list accounting for 52.3% of the capitalization of all companies included. Despite the performance decline that Vertex Pharmaceuticals had in the past year, it still made it to the top of our list.

# AI for Drug Discovery Boom - 2017 vs. Q2 2021

2017

20x industry growth

2021



AI Pharma Companies - 11  
Investors - 30  
Startups - 10

AI Pharma Companies - 300  
Investors - 880  
Corporations - 100

## We Foresee Analogous Boom for Longevity FinTech

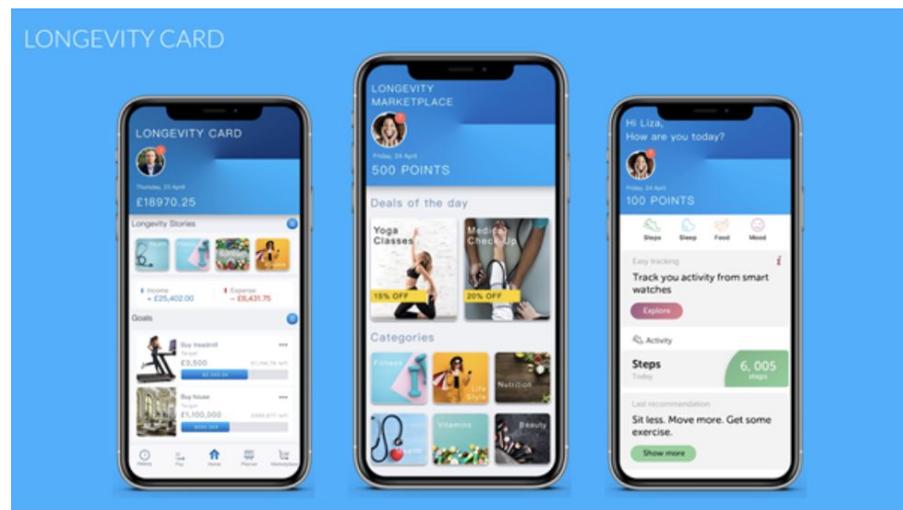
The Longevity Industry is, like AI in Pharma, presently at a nascent stage. The oncoming “Silver Tsunami” will soon become a strong force for pushing the Longevity Industry onto the radars of institutional investors just as AI in Pharma suddenly exploded between 2017 and 2021.

We see Longevity FinTech as the sector that will unite all of the Longevity Industry sub-sectors and, as a result, spearhead its growth. We view Longevity FinTech as the umbrella that will encapsulate and spearhead this growth because once the Longevity Industry begins to accelerate, it will require structured, bankable and tradable financial products, which allow for a wider investor universe to participate in the industry’s funding. It will be the natural occurrence once the Industry evolves beyond its current principal source of funding, which is private direct investment.

We consider Longevity FinTech as the technological platform and marketplace, which will combine relevant solutions from AgeTech, mHealth, Longevity WealthTech and InsurTech. Thus, we are making a significant bet on the growth of the industry by investing in Longevity Banking Card.

**“Longevity Card, a UK-based fintech, has landed investment from Deep Knowledge Ventures and a new, undisclosed early-stage ‘Deeptech’ fund”**

- [FinTech Futures](#)



Users can earn ‘Longevity Points’ by tracking their daily activity and nutrition through the app

# Management Team



**DMITRY KAMINSKIY**

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**GENERAL  
PARTNER**

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Dmitry Kaminskiy is based in London. He is an experienced Longevity Industry investor and entrepreneur, founder of Deep Knowledge Ventures and Aging Analytics Agency since 2014.



**STEFAN HASCOET**

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**HEAD OF SWISS  
OPERATIONS**

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Stefan Hascoet, based in Geneva, is a Capital Markets Professional with 15 years experience in investment products, derivatives & non-recourse lending facilities.



**KATE BATZ**

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**HEAD OF US  
OPERATIONS**

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Kate Batz, based in San Francisco, is licensed to practice law in California and New York. She is a lawyer with 20 years experience as a Corporate Attorney.



**ALEXANDER HOLODNY**

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**HEAD OF UK  
OPERATIONS**

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Alexander Holodny, based in London, is an experienced corporate finance and private equity professional.



**IHOR KENDIUKHOV**

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**DEPUTY MANAGING  
PARTNER**

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Ihor Kendiukhov, based in Berlin, is a quant finance, AI, and deep tech professional, leading Big Data and Algorithmic Analytics at Deep Knowledge Group.

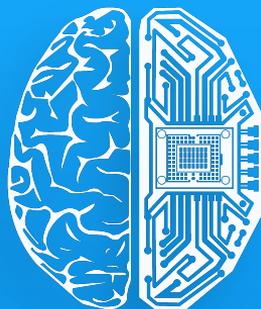


# Legal Disclaimer

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