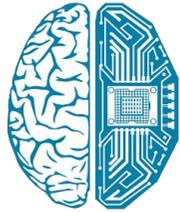


**DEEP
KNOWLEDGE
ANALYTICS
*PHARMA DIVISION***

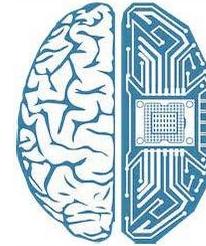
AI in Pharma
Deep Industry Analysis
and Advanced Forecasting

Deep Knowledge Group



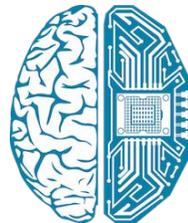
DEEP KNOWLEDGE ANALYTICS

Deep Knowledge Analytics - the analytical arm of Deep Knowledge Ventures, specialising in forecasting on the convergence of technological megatrends, conducting special case studies and producing advanced industry analytical reports on the topics of Artificial Intelligence, DeepTech, GovTech, Blockchain, FinTech and Invest Tech.



DEEP KNOWLEDGE ANALYTICS *PHARMA DIVISION*

Deep Knowledge Analytics Pharma Division - the leading analytical entity specifically focused on deep intelligence of the pharma industry and the AI for Drug Discovery sector. Deep Knowledge Analytics Pharma Division serves as the main source of investment intelligence and analytics for AI-Pharma, a specialized index hedge fund for the AI in Drug Discovery sector.



DEEP KNOWLEDGE VENTURES

Deep Knowledge Ventures - A data-science driven investment fund focused on the synergetic convergence of specific DeepTech verticals. Investment sectors include AI, Precision Medicine, Longevity, Blockchain and Invest Tech.

DEEP KNOWLEDGE ANALYTICS PHARMA DIVISION

Providing Sophisticated Analytics of Pharma Industry and AI in Drug Discovery



Major Sectors of Expertise

AI Deep Learning Biomarker Development Drug Discovery

Our Assets



Next-generation infographics unifying big data analytics with advanced visualization



Near-term forecasts using tangible, qualitative metrics



Customised Pharma Industry analytics services for corporate and institutional clients

The Pharma Division of Deep Knowledge Analytics produced five case studies and analytical reports focused on AI for Drug Discovery sector in 2018, setting the gold standard for analytics on this topic. On multiple occasions, it was covered by top media such as Forbes and the Financial Times. Its opinions, insights and forecasts have been recognized and widely referenced by top executives at the level of senior Vice-Presidents of Big Pharma corporations, such as Johnson & Johnson, Merck, GSK. Recently, MIT named this division as a **top technology think-tank**, acknowledging the AI ranking framework it developed.

Plans for 2019

Deep Knowledge Analytics' Pharma Division is actively increasing both its number of open-access as well as proprietary reports, and the breadth and depth of its industry-landscape and competitive analytics.

Open Source Analytics scheduled for Q2 2019

- Ranking of the "AI-Friendly" CEOs and Board Members of Pharma and Tech Corporations
- Top Analysts AI in Pharma
- Ranking of Corporations Applying AI for Drug Discovery and Advanced Healthcare

Proprietary Analytics scheduled for Q2 2019

- New edition of Proprietary Analytical Report: Comparative Industry Analysis
- Ranking of Investment Funds
- Declining Efficiency of R&D in Pharma Corporations
- Investment targets for AI-Pharma Fund (enhanced analysis of best AI startups)
- Pharma AI Risks

The Pharma Division of Deep Knowledge Analytics aggregates the most advanced team of analysts and experts to produce customized case studies and deep industry analysis for the top executives of big pharma corporations. Its reports cover a number of converging sectors, including AI for Drug Discovery, the systemic declining efficiency of R&D of Big Pharma corporations and the rise of Tech-corporations entering healthcare and drug discovery space.

Approaches

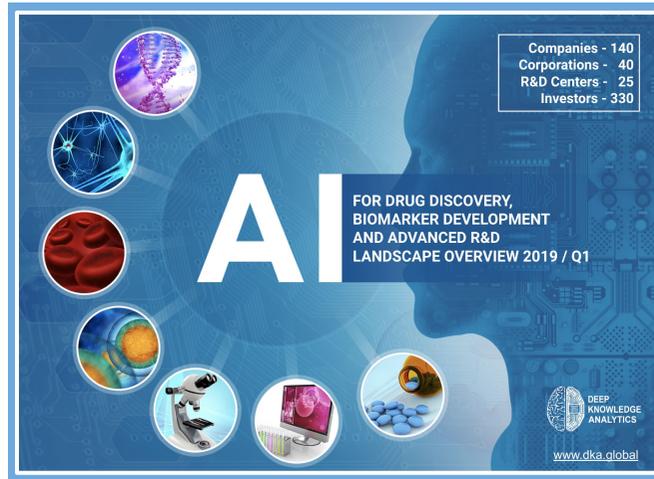
Deep Knowledge Analytics Pharma Division offers several services to its clients:

- Conduct customised case studies, research and analytics for internal (organizational) use, tailored to the precise needs of specific clients;
- Perform customised solutions using specialised software, industry and technology databases, interactive IT-platforms.
- Provide customized competitive analytics and development recommendations for specific companies and corporations interested in enhancing AI in Pharma assets and activities

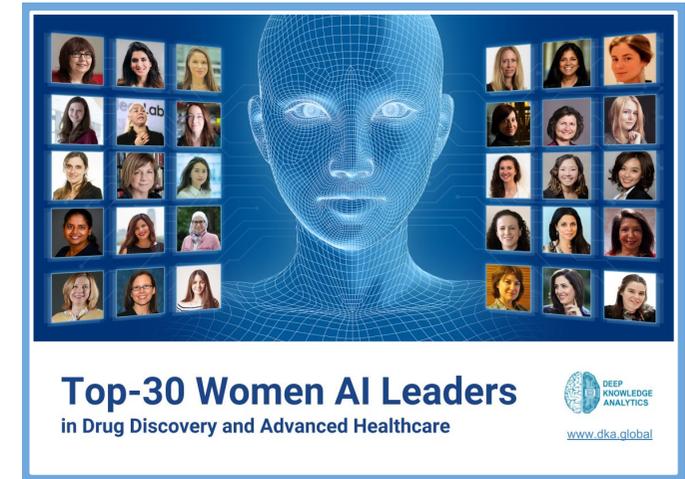
Deep Knowledge Analytics AI in Pharma Division: Reports Published in Q1 2019



AI in Drug Discovery
Industry Analysis Q4 2018



AI in Drug Discovery
Industry Analysis Q1 2019



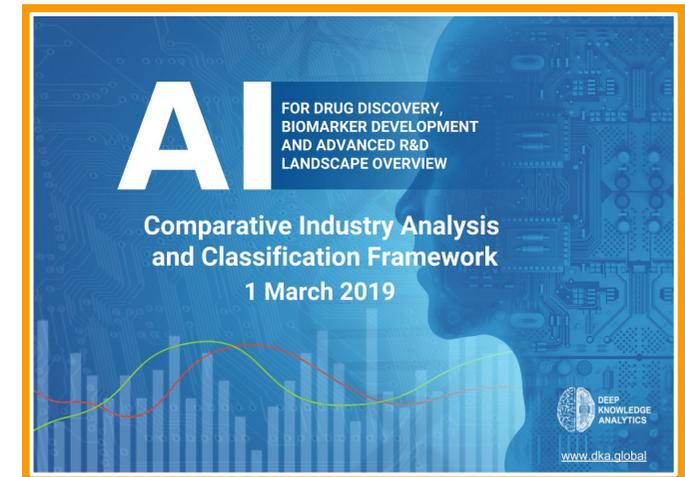
Top-30 Women AI Leaders in Drug
Discovery and Advanced Healthcare



Top 100 AI Leaders in Drug Discovery
and Advanced Healthcare



AI for Drug Discovery
Conferences 2019



Deep Pharma Intelligence
Proprietary Investment Analytics

AI for Drug Discovery, Biomarker Development and Advanced R&D Landscape / 2019 Q1

Companies - 150
Investors - 350
Corporations - 50



Drug Discovery

Advanced R&D

Pharma

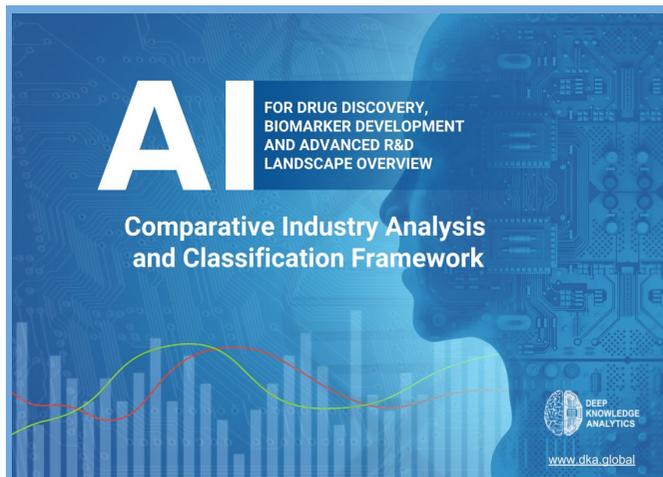
Tech

Biomarker Development

Investors
AI Companies
Corporations



Deep Knowledge Analytics Pharma Division: Upcoming Proprietary Reports Q2 2019



Comparative Industry Analysis & Classification Framework



Pharma AI Stock Index



Top Analysts AI in Pharma



Declining Efficiency of R&D in Pharma Corporations



Top-20 AI in Drug Discovery Investors



Enhanced analysis of most promising AI-companies as the best investments targets for AI-Pharma Index Hedge Fund

Deep Knowledge Analytics the Major Source of Intelligence for AI-Pharma Index Hedge Fund

Deep Knowledge Analytics Pharma Division serves as the main source of expertise for the AI-Pharma index hedge fund, providing sophisticated comparative industry analytics in order to develop and de-risk the fund's investment strategies. Meanwhile, AI-Pharma will execute the strategy, working to become the leading fund in the sector with the next-generation InvestTech solutions.

AI for Drug Discovery companies are highly complex and difficult for investors to evaluate. While roughly 130 companies are active in this sector, only a quarter of them will deliver clear and tangible results, whereas the probability and timelines of future success for the other three-quarters remain uncertain given the size of the challenge before them (applying AI for de novo molecule discovery, for example, being one of the most challenging deliverables for this sector).

Deep Knowledge Analytics' Pharma Division applies quantified metrics and mathematical equations to perform deep comparative analysis of AI for Drug Discovery companies. It compares companies using multiple parameters to differentiate levels of maturity and scientific and technical advantages in a very objective way. For early stage startups, it applies assessment based on several dozen parameters, whereas for the more advanced leading companies we are considering more than 100 factors. The higher degree of complexity of the AI for Drug Discovery industry requires novel, more sophisticated approaches to be aligned with the increased complexity of the industry landscape, in order to be capable of deploying relevant industry intelligence and analytics to develop and guide modern and applicable investment strategy for the AI for Drug Discovery sector.

Examples of Proprietary Analytics

Top-20 Investors in 130 AI-Companies

1 March 2019

Top AI Companies	Investments overall	INVESTORS	Investments overall	Top AI Companies
Atomwise	9	Y combinator SEQUOIA 红杉资本	9	XtalPi WuXiNextCODE
	8	SUSV SOSV OS Fund	8	Atomwise twoAR
SCHRÖDINGER. insitro	8	GV Data Collective DCVC	8	Atomwise RECURSION
Atomwise RECURSION	8	AME AME Cloud Ventures	7	XtalPi
Atomwise deep genomics	6	khosla ventures Andreesen Horowitz	6	insitro twoAR
	6	Amadeus Capital Partners WuXi AppTec	5	Insilico Medicine 英科智能 WUxinextCODE SCHRÖDINGER.
PathAI	5	General catalyst StartX	4	twoAR
PathAI	4	REFACTOR CAPITAL Tencent	4	Atomwise XtalPi iCarbonX
	4	Felicis ventures Draper associates	4	Atomwise
WuXiNextCODE GNS HEALTHCARE	3	AMGEN Ventures Amgen ventures 500 startups	3	

Deep Knowledge Analytics

47

AI for Drug Discovery Partnerships, Investments, Acquisitions

1 March 2019

AI Companies	Pharma Corporations	Tech Corporations	AI Companies
Insilico Medicine 英科智能 Exscientia CloudPharmaceuticals	gsk	Tencent 腾讯	XtalPi Atomwise
CYCLICA Atomwise Numerate	MERCK	Alibaba Group	XtalPi
Biovista XtalPi	Pfizer	amazon	XtalPi
Exscientia SCHRÖDINGER. RECURSION	SANOFI	Baidu 百度	Atomwise
Biovista Insilico Medicine 英科智能	NOVARTIS	IBM	IBM Watson
Numerate NuMedii	Boehringer Ingelheim	Google	XtalPi
AiCure Atomwise	Roche	Apple	Insilico Medicine 英科智能 SCHRÖDINGER.
BenevolentAI	Johnson & Johnson	Canon	
AiCure GNS HEALTHCARE	Roche	Huawei	
Insilico Medicine 英科智能 BERG	AstraZeneca	Intel	
	astellas	HITACHI	
	Brain Storm Spine	SAMSUNG	
	AMGEN	SIEMENS	
	illumina		

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43

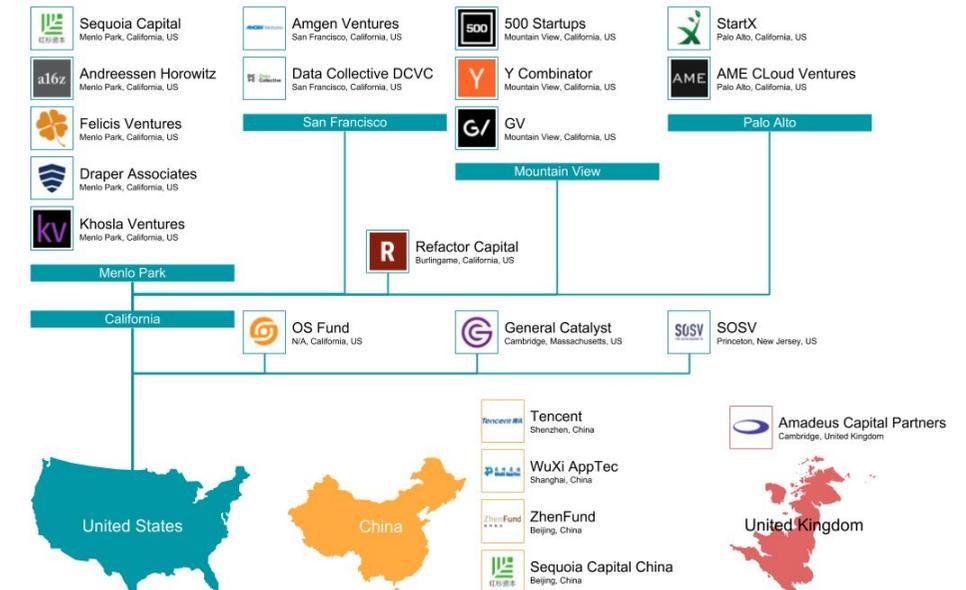
Level of AI-Strength of 130 Companies in Drug Discovery Sector



Deep Knowledge Analytics

39

Top-20 AI for Drug Discovery Investors



Deep Knowledge Analytics

46

Coverage of Deep Knowledge Analytics Pharma Division Reports in the Media

Deep Knowledge Analytics Pharma Division Reports have been covered widely in the media, including Forbes and the Financial Times. More recently, Massachusetts Institute of Technology (MIT) acknowledged Deep Knowledge Analytics as a "top think-tank".

FINANCIAL TIMES

HOME WORLD US COMPANIES TECH MARKETS GRAPHICS OPINION WORK & CAREERS LIFE & ARTS HOW TO SPEND IT

Health + Add to myFT

Pharma companies put faith in AI for breakthroughs

Billions are being bet to find the next revolutionary drug

Camilla Hodgson NOVEMBER 19, 2018

This year has seen a jump in investment from big pharma and a range of joint ventures with health tech groups. In 2018, at least 15 companies have integrated AI into their drug discovery processes, according to Deep Knowledge Analytics, an analysis company.

Forbes

5,871 views | Nov 30, 2018, 01:43pm

An Insight Of AI's Penetration In Drug Development Market

Leading IT and Tech Corporations / AI Companies / Pharma Corporations Advanced AI in Healthcare and Drug Discovery

Pharma Corporations: AstraZeneca, Merck, Roche, Sanofi, Johnson & Johnson, Amgen, Novartis, etc.

AI Companies: Cyclica, Atomwise, Exscientia, etc.

Tech Corporations: Intel, Google, IBM, Amazon, etc.

Different universes converge in the path of AI-based drug development. DEEP KNOWLEDGE VENTURES

Forbes

23,160 views | Dec 16, 2018, 04:17pm

World's Top 20 AI Drug Development Companies

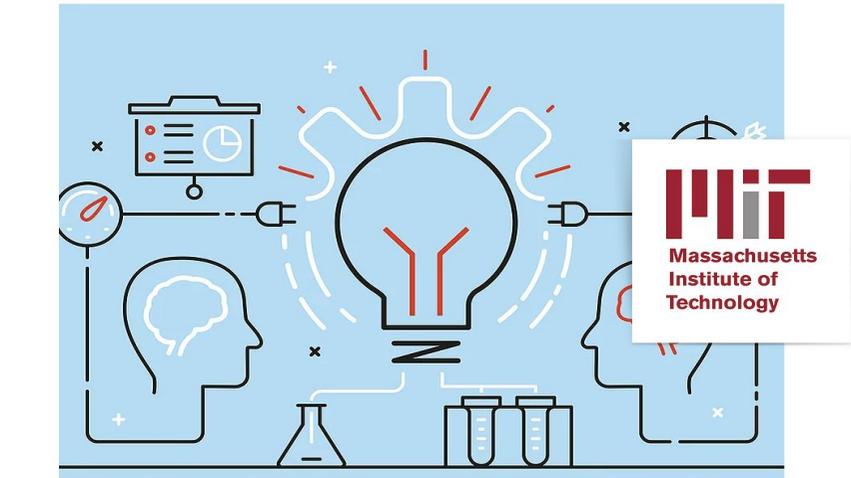
Leading Companies Advanced AI in Healthcare and Drug Discovery

Pharma	AI	Tech
AstraZeneca, Merck, Roche, etc.	Cyclica, Atomwise, Exscientia, etc.	Intel, Google, IBM, etc.

Drug Discovery	Pharma Corporations	Tech Corporations	Advanced R&D in Healthcare
Exscientia, Atomwise, etc.	Merck, Pfizer, etc.	Tencent, Amazon, etc.	XtalPI, etc.

Interconnection of Top Tier AI for Drug Discovery and Drug Development Companies with Pharma and Tech Companies. OKA

MIT acknowledged AI ranking made by Deep Knowledge Analytics.



This week four CSAIL faculty were named among the top 100 global leaders in artificial intelligence for health, according to a new report developed by a top technology think-tank.

Deep Knowledge Analytics's "Top 100 AI Leaders in Drug Discovery and Advanced Healthcare" (PDF) looked at scientists, clinicians and technologists across academia, pharma, and AI companies. Among the honorees were CSAIL principal investigators and MIT professors Regina Barzilay, Tommi Jaakkola, Manolis Kellis and Peter Szolovits.

Forbes

3,379 views | Feb 13, 2019, 03:48pm

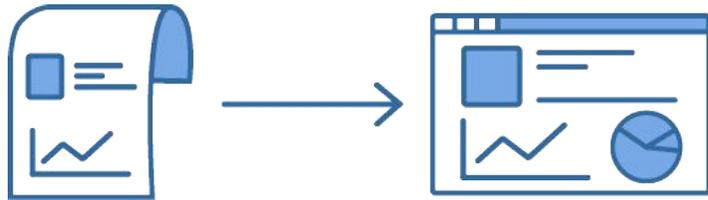
The 100 Leading Pioneers Of AI Drug Development

This human mosaic of Top 100 AI Leaders in Drug Discovery and Advanced Healthcare raises hopes for a better quality of life. DEEP KNOWLEDGE ANALYTICS



Online AI-Pharma Analytics Platform to Enable Sophisticated Frameworks for Advanced Comparative Industry Analytics and Intelligence

In 2019, to compliment its ongoing open-access and proprietary reports, Deep Knowledge Analytics' Pharma Division is releasing an advanced online Pharma Analytics Platform and database featuring interactive visuals which can transform static analytical reports into dynamic infographics updated in real-time. This platform will enable complex interactions between industry entities and stakeholders to be visualized, filtered, searched and thus more easily understood



Once created, this platform will be continuously updated with real-time industry developments and will be significantly upgraded with the integration of elements including:

- A stakeholder smart-matching engine
- Interactive and filterable data visualization
- Tools for the syndication of investment rounds
- Customized report production
- Peer-to-peer curated stakeholder ranking systems
- Big data analytics and other advanced tools and techniques

Deep Knowledge Analytics Pharma Division as the Investment Knowledge and Analytics Nexus for AI-Pharma

AI-Pharma is a specialized index hedge fund for the AI in Drug Discovery sector, using sophisticated analytics to invest in the top 25 AI for Drug Discovery companies.

The fund combines the profitability of venture funds with the liquidity of hedge funds through hybrid investment technologies, significantly de-risking the interests of LPs while providing rising AI-Pharma companies with relevant amounts of investment.

Deep Knowledge Analytics' Pharma Division serves as the main source of expertise for AI-Pharma fund, providing sophisticated industry intelligence and analytics in order to develop and de-risk the fund's investment strategies, and to be used as the basis for the fund's investment target identification, due diligence, and portfolio structuring. Meanwhile, AI-Pharma will execute the strategy, working to become the leading fund in the sector with the next-generation InvestTech solutions.

Deep Knowledge Analytics Pharma Division in Media



“This year has seen a jump in investment from big pharma and a range of joint ventures with health tech groups. In 2018, at least 15 companies have integrated AI into their drug discovery processes, according to **Deep Knowledge Analytics**, an analysis company.”



“Britain has all the required resources, as well as industrial and governmental will, to become a global hub for the technology by 2022, according to analysis by the Big Innovation Centre and **Deep Knowledge Analytics**.”



“**Deep Knowledge Analytics** picked the 'Top 100 AI Leaders in Drug Discovery and Advanced Healthcare' out of an initial pool of 500 outstanding candidates. Unless a new AI winter wind blows and sweeps over the science explorers, their work is quite likely to enhance the quality of life surpassing the most vivid science fiction imagination.”

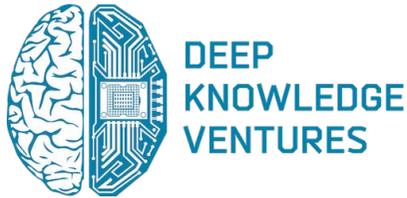


“A report published on Wednesday by the All Party Parliamentary Group for AI claimed that the UK has all of the basic elements necessary to compete effectively in a global race to develop AI technology. The Big Innovation Centre and **Deep Knowledge Analytics** collected and produced the report.”

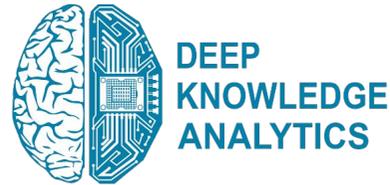


“This week four CSAIL faculty were named among the top 100 global leaders in artificial intelligence for health, according to a new report developed by a **top technology think-tank**. **Deep Knowledge Analytics**'s “Top 100 AI Leaders in Drug Discovery and Advanced Healthcare” looked at scientists, clinicians and technologists across academia, pharma, and AI companies.”

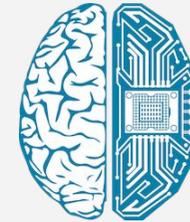
Cooperation



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**DEEP
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ANALYTICS
PHARMA
DIVISION**

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Deep Knowledge Analytics Pharma Division is primarily interested in strategic collaboration with international corporations, pharma and tech companies, NGO's and governmental organizations of progressive countries on projects and initiatives related to next-generation technologies in pharma industry and in corresponding fields of business, technology and science.

Deep Knowledge Analytics Pharma Division can engage with strategic partners via several different approaches, including:

- Conducting of customised case studies, research and analytics for internal (organizational) use, tailored to the precise needs of specific clients in pharma industry and related areas;
- Production of analytical reports for open source use (freely accessible);
- Performing of customised solutions using specialised software, industry, science and technology databases, interactive IT-platforms.

In some specific cases, if it fits the interests of Deep Knowledge Analytics' Pharma Division, we are open to considering co-sponsoring research and analytics for the production of both internal and openly-accessible industry reports and special case studies.

DEEP KNOWLEDGE ANALYTICS "PHARMA DIVISION"

is interested in strategic collaboration with pharma corporations, NGOs and governments of progressive countries on projects related to next-generation technologies in healthcare and pharma industry with high disruptive potential.