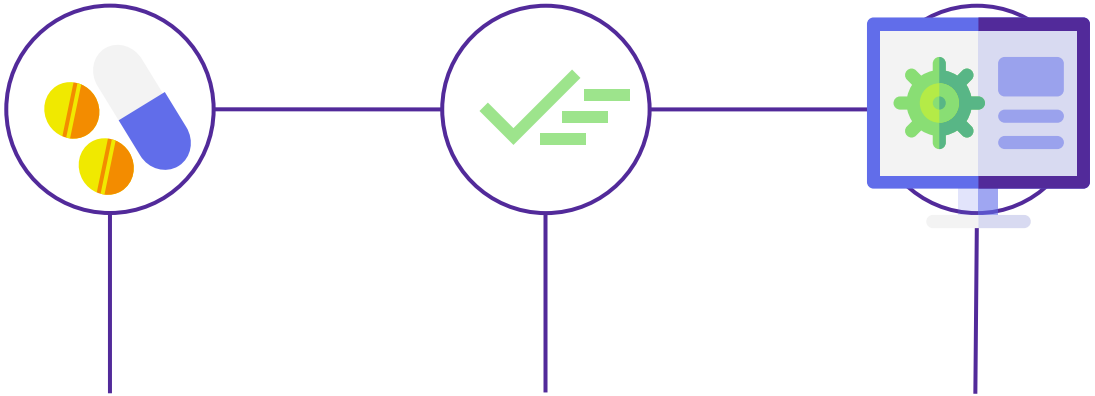
New Approach

Machine learning for Pharma & Nutraceuticals

Problem



Development of new medicines/biomarkers

Long process (≈12 years)
Expensive ($ 2.5 B)

Machine-learning

Selection of the compounds from databases (millions of compounds)

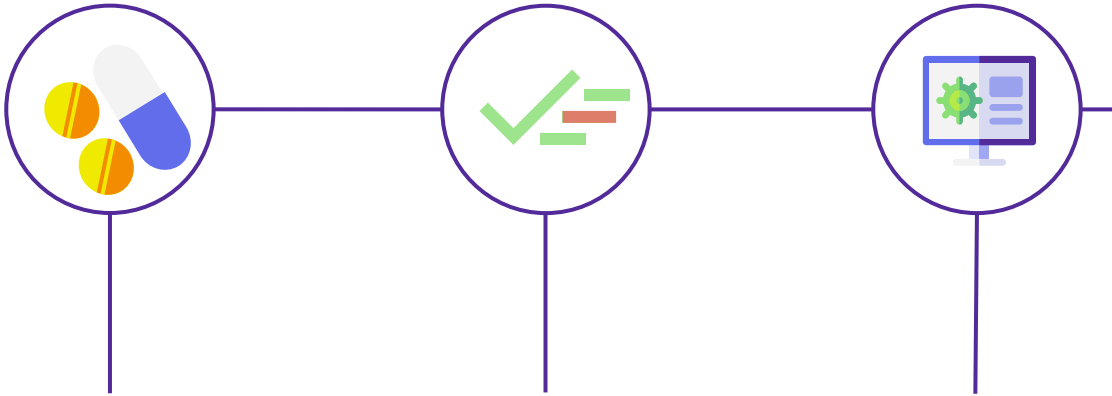
Infrastruture

Massive

Naylor, Stephen & Schonfeld, J.M.. (2014). Therapeutic drug repurposing, repositioning and rescue - Part I: Drug Discovery World. 16. 49-62.

Solution

iMilkWay



Development of new medicines/biomarkers

Long process (≈5,5 years)
Expensive (~$ 300 million)

Machine-learning

Selection of the most promising compounds from databases (millions of compounds)

Infrastruture

Massive

iMilkWay – an **i**mprovement of the **WAY** of **M**athematical **I**nterpretation of the **L**ogistic ran**K**

What does this method do?

DOI:10.31300/TDB.13.2020.1-20
https://doi.org/10.1101/2021.02.22.432316

Product

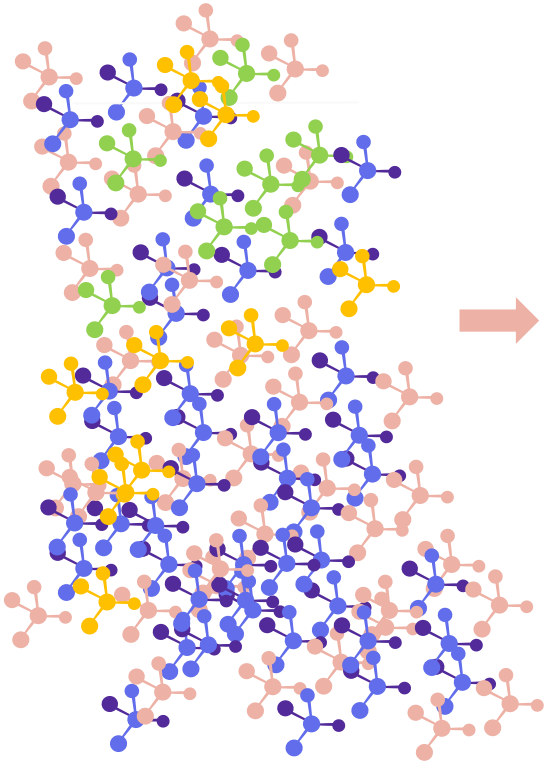
Machine learning technique for **virtual screening** of drug/nutraceutical databases to **choose** the most promising ones

iMilkWay

Propose the most promising "**key**"
(drug or nutraceutical)
to its "**lock**"
(Therapeutic or biological target)

High Performance (good results in a short time!)

Produt-Scheme



Choose a terapeutical target or a biological target

iMilkWay

90%

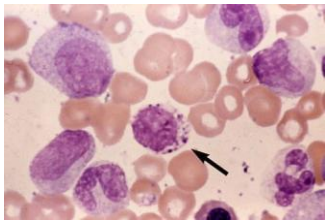
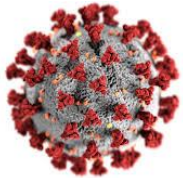
85%

70%

55%

50%

...

DISEASE	TARGET	PROPOSALS
Chronic myeloid leukaemia 	Cyclin-dependent kinase type 2 - CDK-2	**Pramocaine** [1] **Proclorperazine** [2] **Trifluoperazine** [2, 3]
SARS-CoV-2 	SARS-CoV-2	**Benzoic acid** - SARS **Ribavirin** - SARS **Taribavirin** - SARS **Tetraclorodecaoxido*** (08/04/2020)

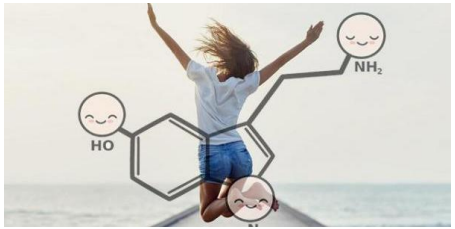
iMilkWay

theoretically validated

1. Hardt, C., Beber, M. E., Rasche, A., Kamburov, A. and Herwig, R. 2019, ToxDB. Vertebrate Genomics Department at the Max Planck Institute for Molecular Genetics in Berlin, Germany.
2. Qi, L. and Ding, Y. 2013, Science China Life Sciences, 56(11), 1020-1027.
3. Feng, Z., Xia, Y., Gao, T., Xu, F., Lei, Q., Peng, C., Yang, Y., Xue, Q., Hu, X., Wang, Q., Wang, R., Ran, Z., Zeng, Z., Yang, N.,Xie, Z. and Yu, L. 2018, Cell Death & Disease, 9(10), 1006.

DISEASE → TARGET

Depression



Selective serotonin reuptake inhibitors (5-HT1A) - P31645

Migraine

Triptans and derivatives - P28222, P28221

Obesity

Receptor agonists MC-4R - P31645

DISEASE → TARGET

Hyperglycemia

AMP-activated protein kinase (AMPK) - Q9Y478 - Biguamides

Hypercholesterolemia

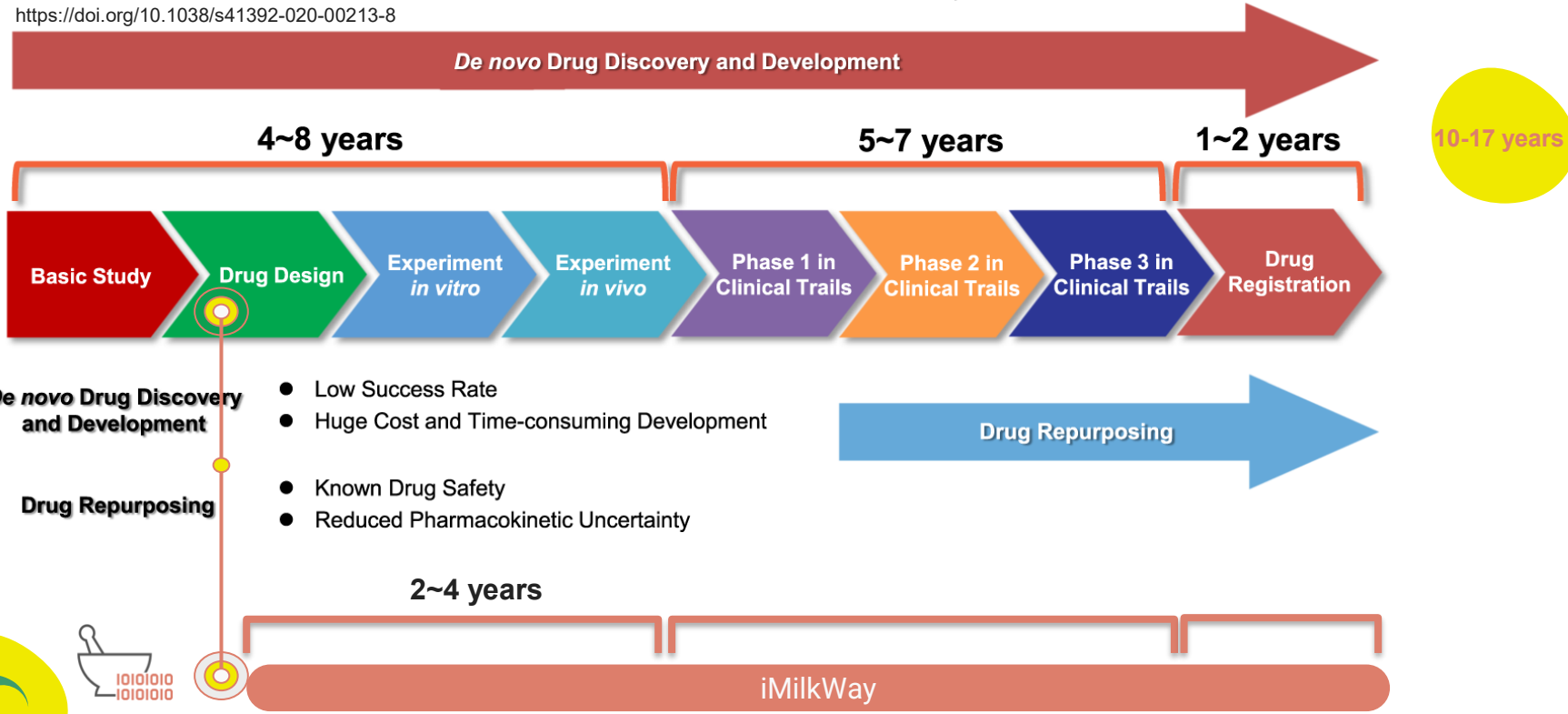
3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitors (HMG-CoA redutase)

Erectile dysfunction

Phosphodiesterase inhibitors –type 5 - O76074

Customer Value Proposition

https://doi.org/10.1038/s41392-020-00213-8



Market

Best 5 biggest biotechnology companies

Novo Nordisk A/S
Revenue (TTM): **$24.31 billion**
Net Income (TTM): $7.68 billion
Market Cap: $293.94 billion
1-Year Trailing Total Return: 23.38%

Moderna Inc.
Revenue (TTM): **$20.68 billion**
Net Income (TTM): $11.76 billion
Market Cap: $72.95 billion
1-Year Trailing Total Return: -35.59%

BioNTech SE (BNTX)
Revenue (TTM): **$20.37 billion**
Net Income (TTM): $11.35 billion
Market Cap: $40.91 billion
1-Year Trailing Total Return: -40.54%

Regeneron Pharmaceuticals Inc.
Revenue (TTM): **$13.71 billion**
Net Income (TTM): $5.37 billion
Market Cap: $78.53 billion
1-Year Trailing Total Return: 16.44%

Vertex Pharmaceuticals Inc.
Revenue (TTM): **$8.7 billion**
Net Income (TTM): $3.27 billion
Market Cap: $74.85 billion
1-Year Trailing Total Return: 35.91%

https://www.investopedia.com/articles/markets/122215/worlds-top-10-biotechnology-companies-jnj-rogvx.asp

Market

Best colleges and universities in the world for clinical and industrial drug development

Massachusetts Institute of Technology (MIT) - USA

Revenue (2023): **$4,655 million**
Expenses (2023): **$4,338 million**

University of Oxford - UK

Revenue (2021/22): **£2.78 billion**
Expenses (2021/22): **£2.90 billion**

University of California, San Francisco (UCSF) - USA

Revenue (2021/22): **$9,45 billion**
Expenses (2021/22): **$8.77 billion**

ETH Zurich - SWITZERLAND

Revenue (2022): **CHF 1,804 million**

Shanghai Jiao Tong University - CHINA

Revenue (2021): **¥15.8 B**

https://www.theedadvocate.org/best-colleges-and-universities-in-the-world-for-clinical-and-industrial-drug-development/
https://vpf.mit.edu/sites/default/files/downloads/TreasurersReport/MITTreasurersReport2023.pdf

Business Model

Register the intellectual property

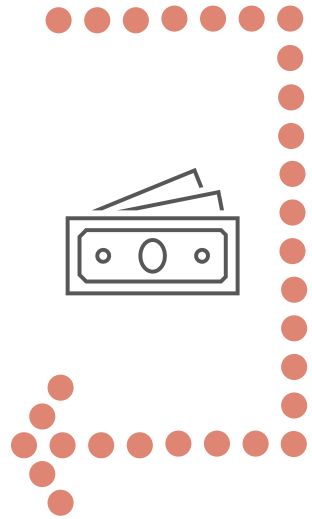
Sale or licensing

Biotechnology companies/ Universities

Test the proposals

New Approach

Propose new Drugs & Nutraceuticals



PARTNERSHIP

Financial support to

- Pay salaries
- Purchase services and software licenses
- Pay fees for intellectual property

Competitive Advantages

Method for screening and analyzing drugs and/or nutraceuticals

> speed

\+ accurate

Management of imbalanced data

Intellectual capital

Inventor of 3 patents

PCT BR 10 2020 007050 9
TETRACHLORODECAOXIDE to treat COVID-19
PCT BR 10 2019 027703 3
Patente do método de triagem de fármacos
Patente Nacional n.º 117266

Co-author of scientific papers

https://doi.org/10.1101/2021.02.22.432316
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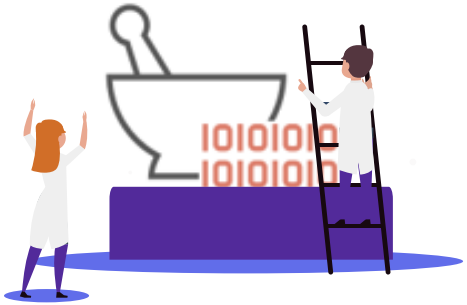
10 years in academic/scientific projects

Skills in clinical trials

Skills in pharmaceutical area

Team & Founder's Dream



PhD, MSc Bioinformatics

MSc Pharmaceutical Sciences

Experience in IP and knowledge transfer

MSc Pharmaceutical Sciences

Postgraduate in Management and Direction of Health Services

Training and monitoring clinical trials

Make the **DIFFERENCE** in the **HEALTH MARKET**

NOVEL and **EFFICIENT** AI techniques (own PATENT)

New Approach
Machine learning for Pharma & Nutraceuticals

A NEW APPROACH TO FASTER, SMARTER THERAPEUTIC DEVELOPMENT

REVOLUTIONIZING PHARMACEUTICAL RESEARCH WITH MACHINE LEARNING

Thank you!

https://new-approach.ai/