Services of Big Data Analytics and Artificial Intelligence for Precision Medicine

IEEE MELECON 2020

It was the beginning of 2019…

Simona
Molecular Biology
Reseaercher

Simona
Bioinformatics
Reseaercher

Salvatore
Software Architect
Industry

It was the beginning of 2019…

New Idea

What Innovation?

Technologies

New Idea

Methodologies

Some months later

Mariella
Data Science
Reseaercher

Our Main Goal

How to
Support phisicians to provide better health care
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PHOENIX eHealth Platform

Molecular Interactions

Genotype Phenotype

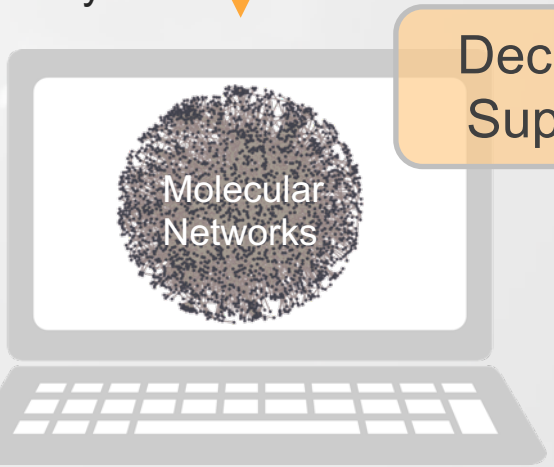
Biological Annotations

Clinical Data

Public/proprietary Biological Big Data

Data integration and analysis

Disease stratification
Signature components
Drug reallocation
Therapy selection
Target identification



Decision Support

Starting Point

Other important acknowledgements

Finalists (ICT)

PREMIO NAZIONALE INNOVAZIONE

BIOUPPER Startup Accelerator

Winners

eit Health

RIS Innovation Call 2020

Selected

eit Health

Start-ups Meet Pharma

Get it! PERCORSO DI VALORE

Maria Jundala
Age: 42
Gender: Female
Blood Pressure: Normal
Smoking: No
Diet: Vegetarian

Disease diagnosted:

Rheumatoid arthritis

Precision therapy for Maria Jundala

Markers

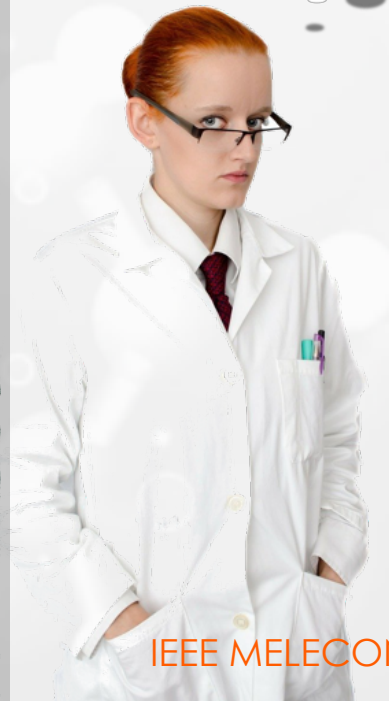
PTPN22
HLA-DRB1
ERBB2
SLC22A4
...

Rheumatoid arthritis

PROBLEM

After some time...

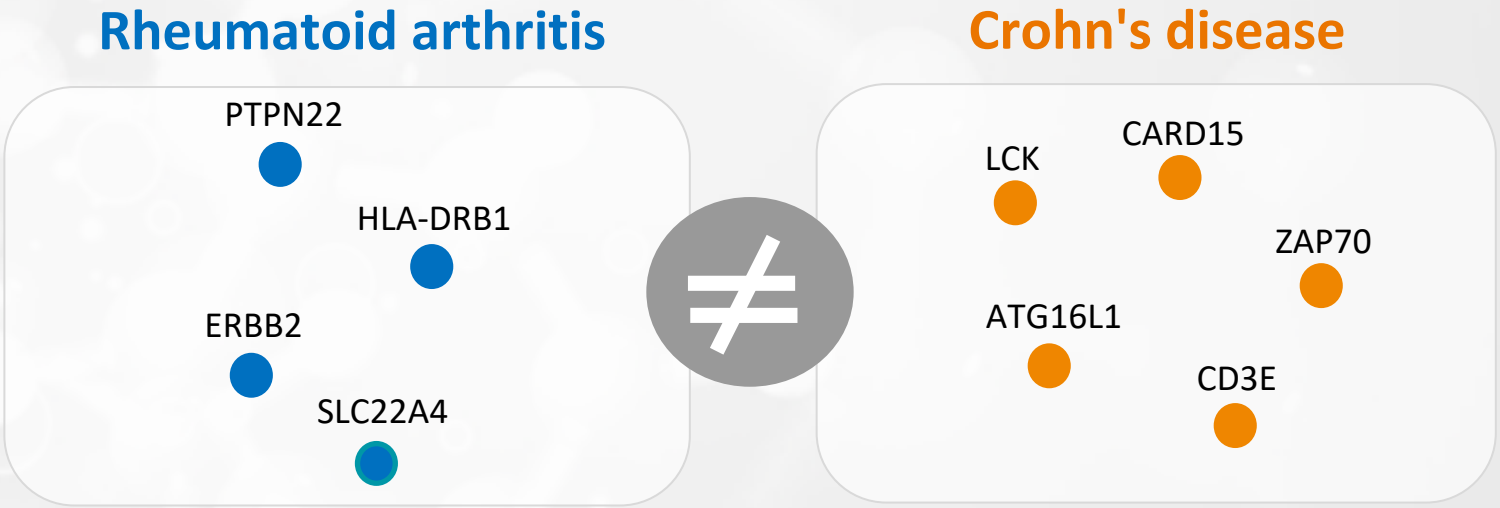
Disease:
Crohn's disease



WHY?

Could doctors have prevented it?

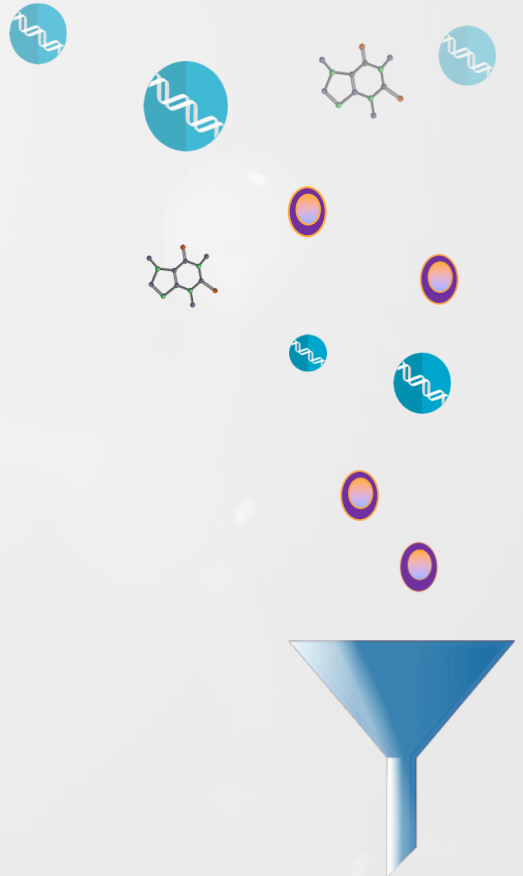
NO, to date



Markers for the two diseases are completely different

But further information is hidden into data inside huge and heterogeneous databases

Need: How to extract value from data?



PHOENIX eHealth Platform

Patient information

Markers selection

Computing…

PHOENIX eHealth Platform

Markers suggestion

Disease risk stratification

PHOENIX would have shown to doctors that …

Rheumatoid arthritis

PTPN22

HLA-DRB1

ERBB2

SLC22A4

≠

Crohn's disease

LCK

CARD15

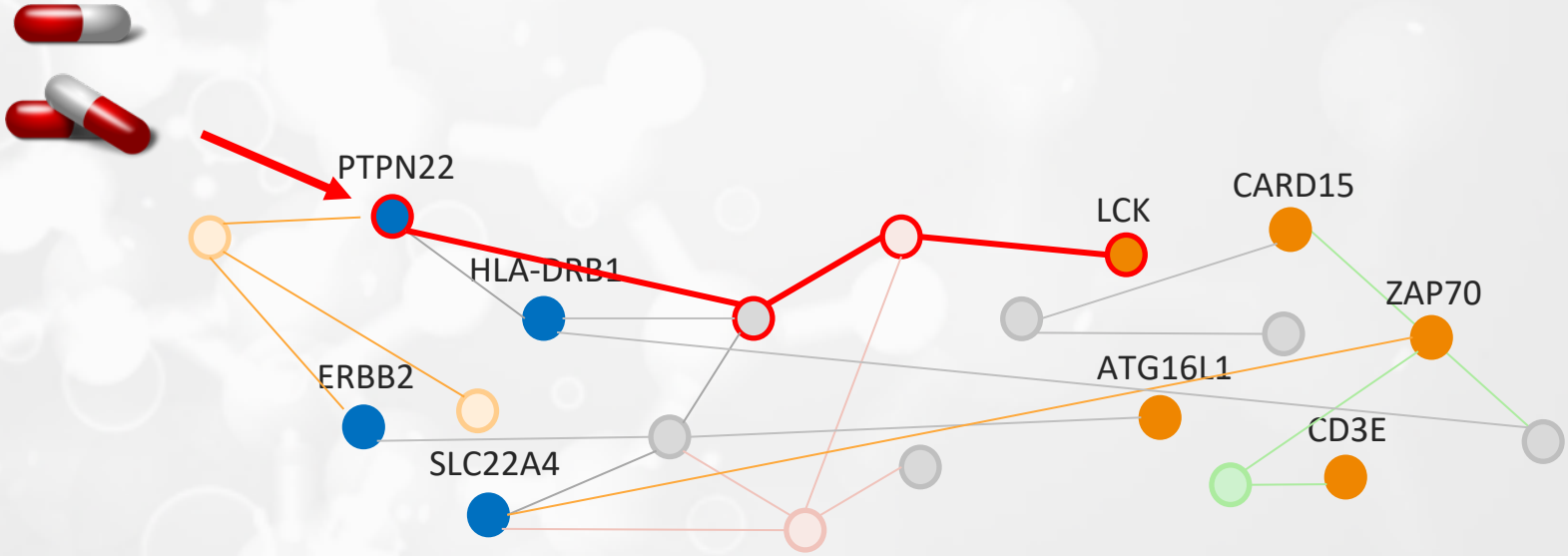
ZAP70

ATG16L1

CD3E

… markers of the two diseases were linked by molecular interactions …

… and specific pathways could have been activated by that drug



PHOENIX eHealth Platform

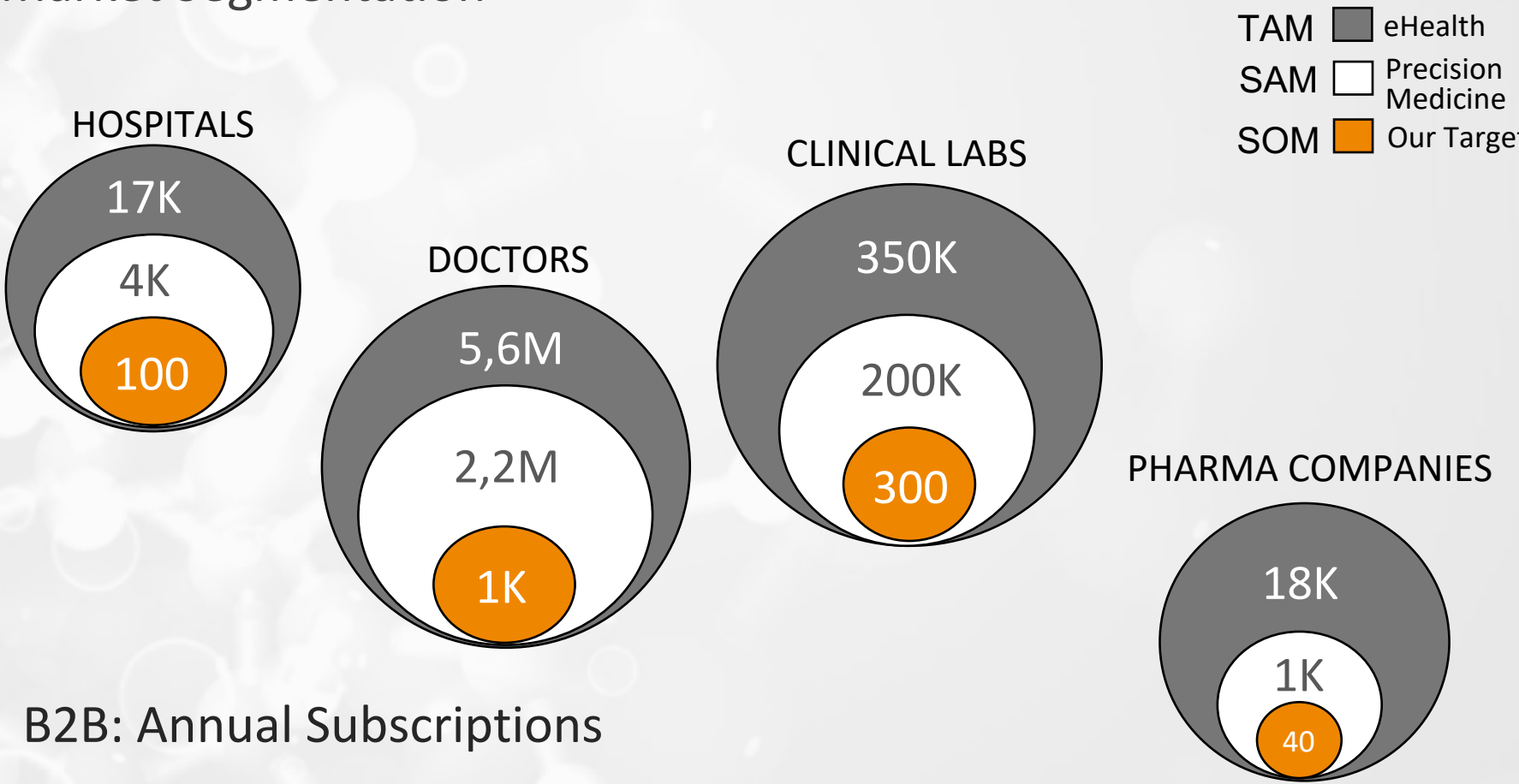
So they could have chosen a more accurate therapy for Maria Jundala

Rheumatoid arthritis

Crohn's disease

Knowing that she was very sensitive to contract Crohn’s disease

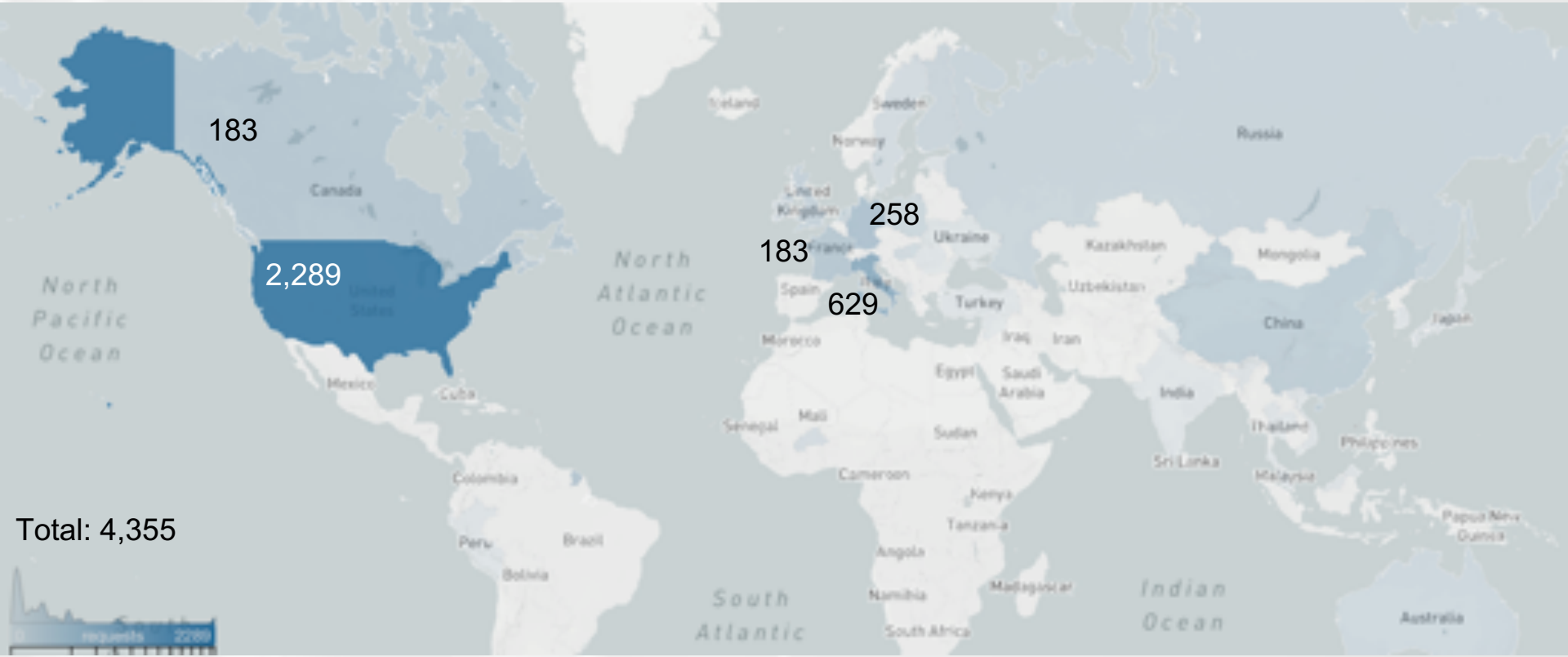
Market Segmentation



B2B: Annual Subscriptions

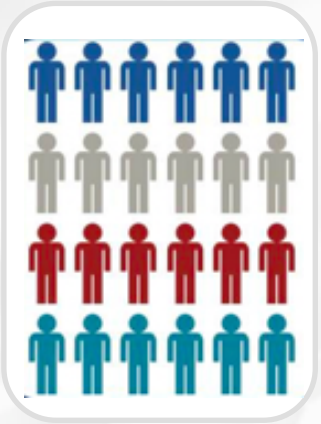
Precision Medicine Market

Last month requests on www.kazaamlab.com



Application for Health Emergency

1

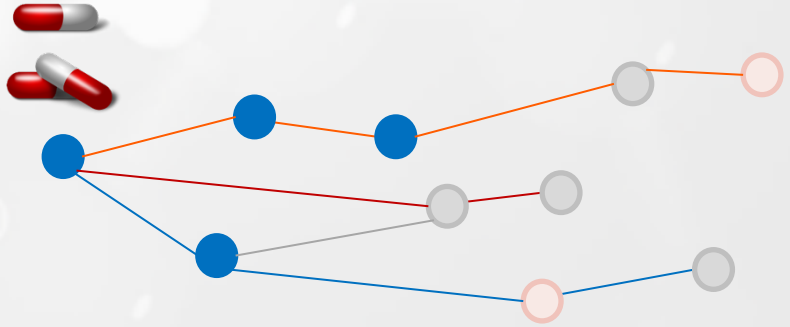


Patient categorization and risk stratification

Different actions for different categories

2

Reallocation of existing drugs



FILL THE GAP BETWEEN DATA AND PRECISION MEDICINE

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