



Information Technology  
for Translational Medicine

# Improving Quality and Management of (Bio)Medical Data: Bridging the Valley of Death towards Personalized Medicine

Data management solutions for pharma and healthcare industry

April 6<sup>th</sup> 2017

Dr. Andreas Kremer (Co-founder & CEO)  
ITTMM (IT for Translational Medicine) S.A.



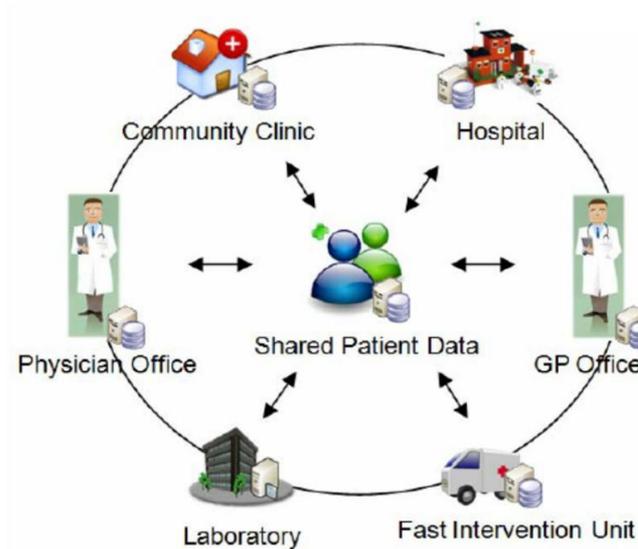
# The field is changing: Pharma & Medicine

Past – Presence – Future



*Health Apps*

## Creating the Virtual Patient



**Patient Centric View**

Various sources from the internet

# Challenges for Translational Research

Moving an idea from basic research to clinical application and back to the lab for more basic science is a challenge also due to the different needs ...

Hypothesis  $\Rightarrow$  DoE / Assay

Problem  $\Rightarrow$  (ethical) Solution / Tools

Optimal communication, interpretation, evaluation, and discussions is needed across multiple disciplines including (not exclusive):

Physicians

Bench scientists

Bioinformaticians

(bio)Engineers

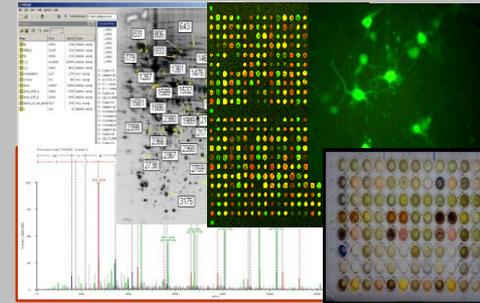
Epidemiologists

Mathematicians, Chemists, Pharmacologists

& many more like patent experts, business developers

**Multidisciplinary & Multinational**

Lab (Academic/ Industry)



Hypothesis  $\Rightarrow$  DoE / Assay

Clinic (Hospital)



Problem  $\Rightarrow$  (ethical) Solution

Improving quality and lifespan of (bio)medical data  
Bridging the Valley of Death towards Personalized Medicine



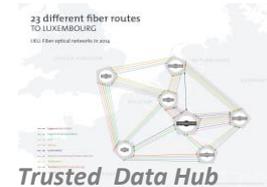
**ITT M S.A.**

# About ITTM S.A.

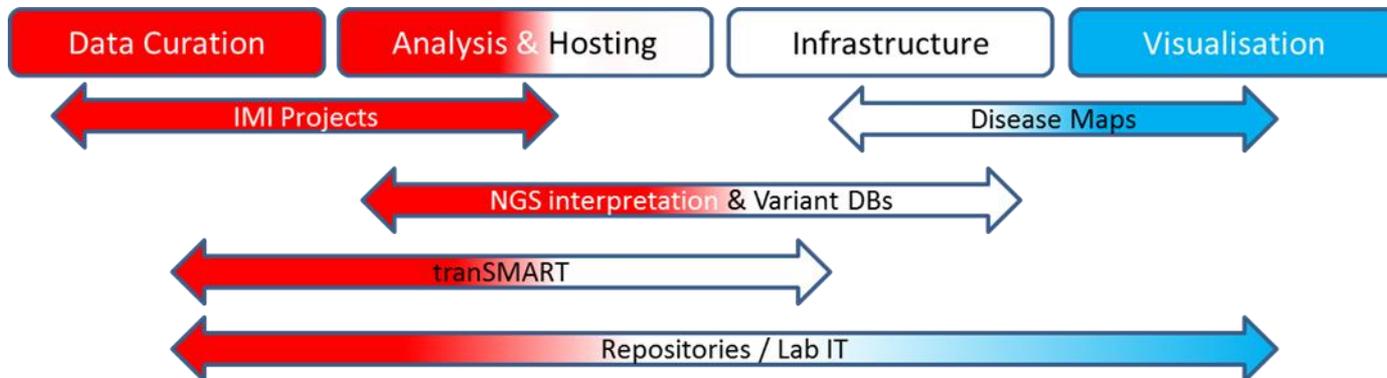


Incorporated 2015 in Luxembourg

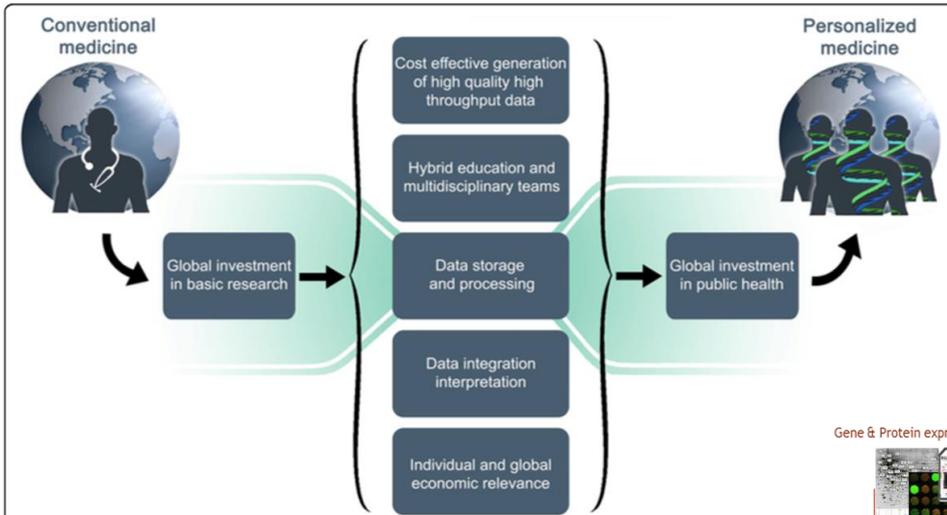
Spin-off of the LCSB (Luxembourg Centre of Systems Biomedicine) of the University of Luxembourg



Strategic Investment by

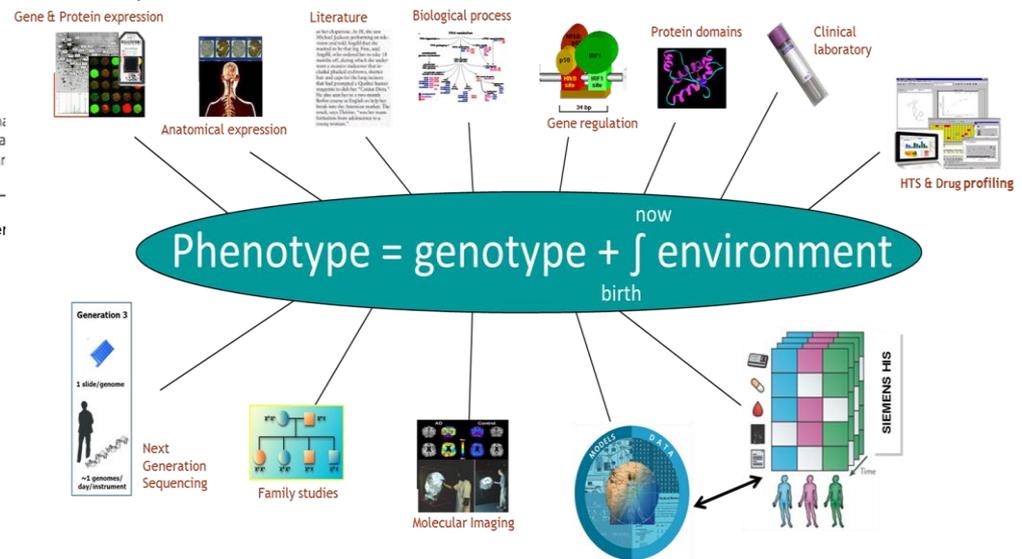


# Current Bottlenecks & Pain points



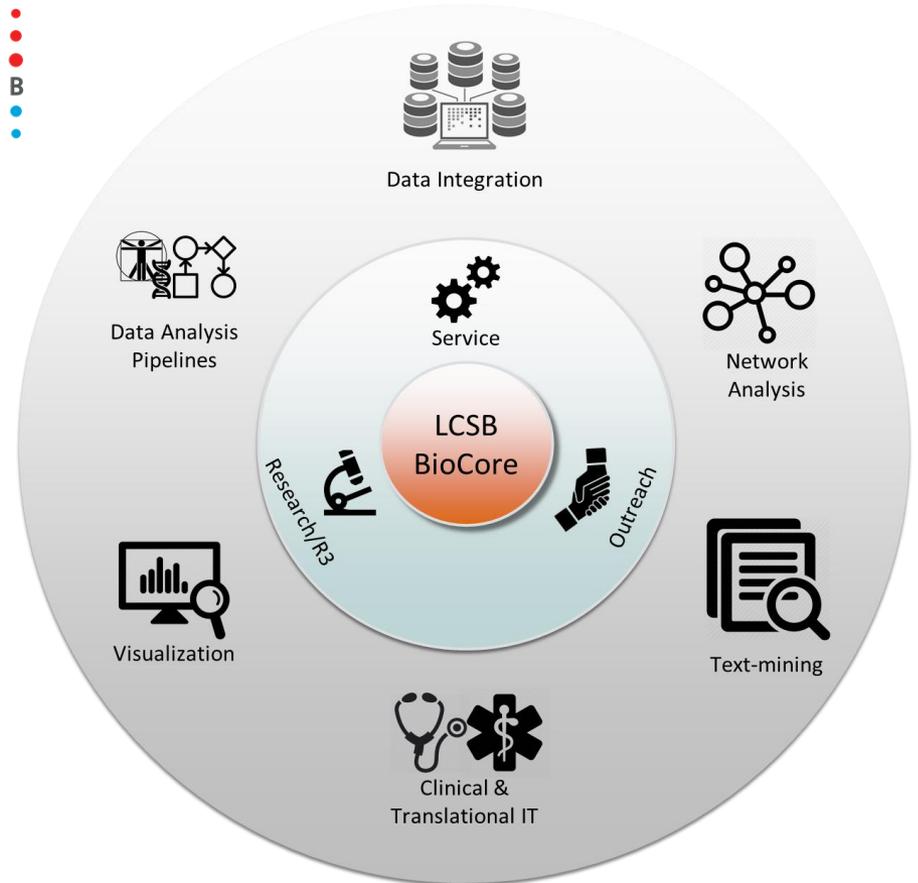
**Fig. 6** Bottleneck toward personalized medicine. The collective challenges to make the transition from conventional to person: include: i) generation of cost-effective high-throughput data; ii) hybrid education and multidisciplinary teams; iii) data storage a data integration and interpretation; and v) individual and global economic relevance. Massive global investment in basic resear global investment in public health for transformative medicine

Alyass et al. BMC Medical Ger



# Strategic Activities (I)

Bridging the Gap... Collaboration with LCSB



## Bioinformatics Core Facility of the LCSB:

>35 FTE's

Cluster with >5000 cores

Several large memory machine 1-4 TB RAM

~5 PetaByte storage

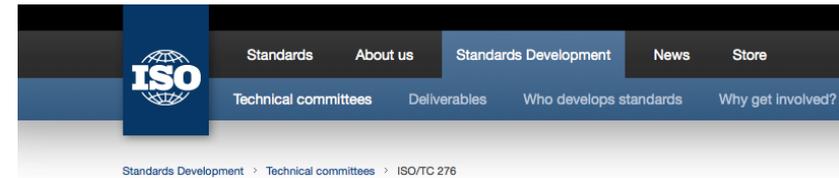
**ELIXIR-Luxembourg** - The place for long term sustainable hosting of clinical, translational and medical data for academia and the pharmaceutical industry

# Strategic Activities (II)

Bridging the Gap... Standardisation can help (not only in ICT)



smartR



## ISO/TC 276 Biotechnology

About Contact details Structure Liaisons Meetings Tools

Secretariat: DIN  
Secretary: Mrs Lena Krieger  
Chairperson: Mr Ricardo Gent until end 2019  
ISO Central Secretariat contact: Mrs. Laura Mathew  
Creation date: 2013

### Scope:

Standardization in the field of biotechnology processes that includes the following topics:

- Terms and definitions;
- biobanks and bioresources;
- analytical methods;
- bioprocessing;
- data processing including annotation, analysis, validation, comparability and integration;
- metrology.

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## About CHARME

**Harmonising standardisation strategies to increase efficiency and competitiveness of European life-science research (CHARME)**

### WG2 Innovation transfer

WG Lead: Andreas Kremer (Luxembourg)

### Data Curation



Standardized and industrialized data curation

- Improved data value, lifespan, and quality
- reduced complexity
- prolonged data availability
- increased data interoperability
- ease of data analysis

### Analysis & Hosting

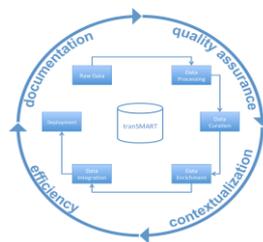


Customized data analysis workflows and visualization tools

Secure data hosting and platform setup, secure archiving (in Tier 3/4 data centers)

**Opal Clinical:**  
sequence data into high-quality clinically meaningful insights

### IT Infrastructure



transSMART, recognized by the international translational research community and pharmaceutical industry

Custom workflows including machine learning, deep learning and intelligent systems

### Visualisation



Expert-curated comprehensive disease map development, facilitating

### Training (TaaS)



Online and on-site training of users and administrators

**NEW**

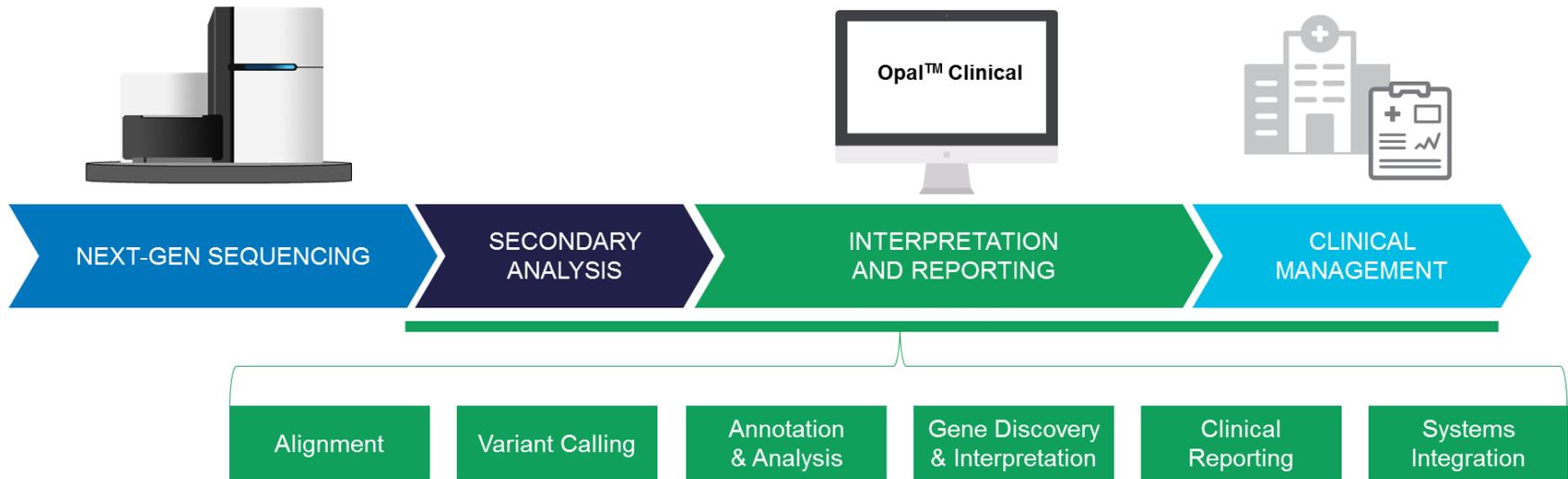
**ITTM**

Information Technology  
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**COMMUNIQUÉ DE PRESSE – PRESS RELEASE**  
ITTM AND ABBVIE TO COLLABORATE ON DISEASE MAP FOR ALZHEIMER'S  
ITTM S.A. and AbbVie Germany, today announced that they signed a two-year agreement to build a comprehensive up-to-date knowledge map for Alzheimer's Disease.  
Esch-sur Alzette, Luxembourg and Ludwigshafen, Germany, 3 April 2017

# Analysis & Interpretation of Sequencing Data

Partnership with Fabric Genomics



Clinical Software That Turns Raw Genome Sequence Data Into High-quality, Clinically Meaningful Insights (PLUS System Integration)

# Improving quality and lifespan of (bio)medical data

## Bridging the Valley of Death towards Personalized Medicine



## Outlook

Data Scientists  
... just a buzzword?

DATA

# Data Scientist: The Sexiest Job of the 21st Century

by **Thomas H. Davenport** and **D.J. Patil**

FROM THE OCTOBER 2012 ISSUE

“Think of him or her as a hybrid of data hacker, analyst, communicator, and trusted adviser.”

October 2012 Issue



# New in Luxembourg

## Bachelor programme and specializations in Medicine



CHAMBRE DES DÉPUTÉS  
DU GRAND-DUCHÉ DE LUXEMBOURG

Actualité Organisation et fonctionnement Travail à la Chambre La Chambre et l'UE La Chambre et vous

Vous êtes ici: Actualité > A la Une

A la Une

Dossiers en cours <-RETOUR AUX ARTICLES

Chamber TV

Annonce emploi

23 March 2017

**UN BACHELOR EN MÉDECINE À L'UNI.LU À PARTIR DE 2020**

**Expected to start in 2020**

**Medical specializations in  
Neurology and Oncology  
as of 2019 for doctors**



*A partir de 2020, il sera possible*

Home // LCSB // News & E... // Bachelor programme and specializations in medicine to be established



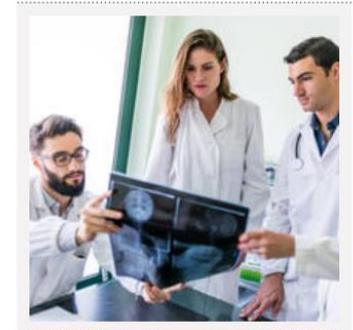
### Bachelor programme and specializations in medicine to be established

Share this article:     

Published on Thursday, 30 March 2017

The government has decided to establish new medical training programmes in Luxembourg within the next years.

The University of Luxembourg will set up a bachelor programme in medicine that will allow students to complete three years of their studies in Luxembourg, instead of only one year so far. The courses are expected to start in 2020. The programme will be carried out in close cooperation with other universities, such as the University of Strasbourg. "Creating an entirely new bachelor in Medicine will give Luxembourg the opportunity to design the best curriculum to prepare students for the Medicine of the Future," says LCSB Director Prof. Rudi Balling. Considering the digitalization trends in medicine, students will not only require traditional knowledge in medicine, but also be able to talk to research and data management experts during their career. "In Luxembourg we now have the chance to create a program that will be a role model for future medical education in Europe."



# Thank You! Merci! Vielen Dank!

## WE ARE PASSIONATE ABOUT YOUR DATA

ITTM offers highly integrated BioIT services for translational medicine studies & clinical trials



Curation &  
Standardization



Secure Hosting  
& Infrastructure

**Data Quality  
& Context**



Visualization



Analysis

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