



"Smart Pharmaceuticals" for Digital Health & The Precision Medicine Era

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Medimetrics

Company Overview

- Spin out from Philips - July 2011
 - Private (main investors Philips and ZFHN Heilbronn)
 - Based in the Netherlands, USA & Germany
- Inventor/developer of
 - IntelliCap® technology - world's first & only electronic oral drug delivery & patient monitoring capsule
 - LiGalli intravaginal ring – JV with LiGalli BV
- Extensive Proof of Technology – in animal and clinical studies
 - Close partnership with Philips for production, development, and technology
 - Projects with 5 of top 10 pharma companies
 - CE Marking
- Medimetrics provides access to the IntelliCap® technology for :
 - Smart Pharmaceuticals
 - Pharma R&D Services








Introduction – Medimetrics Awards

Medimetrics Awards


External Recognition for Innovation



Winner of the Frost & Sullivan New Product Innovation Award 2015.
Winner of the Accenture Innovation Award 2014 in the category High-Tech.



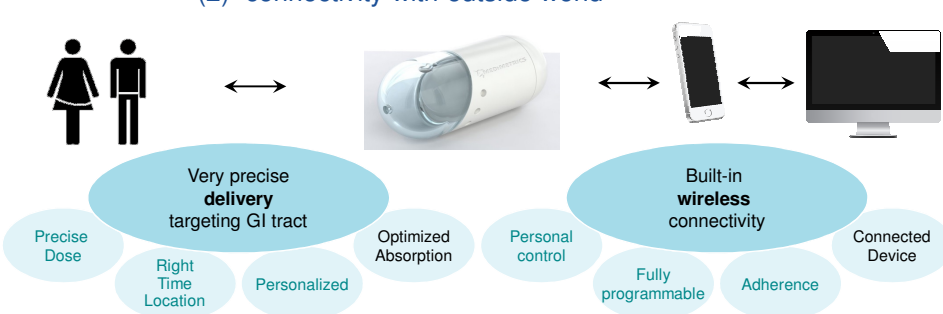
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Medimetrics Technology

Medimetrics' Unique Core Competencies


- (1) very precise delivery of drugs
- (2) connectivity with outside world



The diagram illustrates the Medimetrics technology ecosystem. On the left, a patient icon is connected by a double-headed arrow to a white IntelliCap device. The device is connected by another double-headed arrow to a smartphone, which is in turn connected to a computer monitor. Below the patient icon, a large blue oval labeled 'Very precise delivery targeting GI tract' is surrounded by four smaller blue ovals: 'Precise Dose', 'Right Time Location', 'Personalized', and 'Optimized Absorption'. Below the smartphone, a large blue oval labeled 'Built-in wireless connectivity' is surrounded by four smaller blue ovals: 'Personal control', 'Fully programmable', 'Adherence', and 'Connected Device'.

The IntelliCap® acts by real-time wireless drug release guided by the physiology (pH, transit time and temperature) of the gut regions


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Core Competencies

Value based on our Core Competencies -> 2 case studies

CC1
very precise delivery
over a certain time



CC2
Communication



Company	Intarcia	Proteus
Product	implantable drug-device combination (only CC1)	Chip on a tablet – to communicate with outside (only CC2)
Valuation	<ul style="list-style-type: none">- latest funding round : 300 MM USD (2015)- valuation 5.5 B USD	<ul style="list-style-type: none">- latest funding round 174 MM USD (2014)

Conclusion :

- each of the two core competencies is potentially very valuable
- in contrast to these companies, Medimetrics offers both CC's into one product !

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Prologue

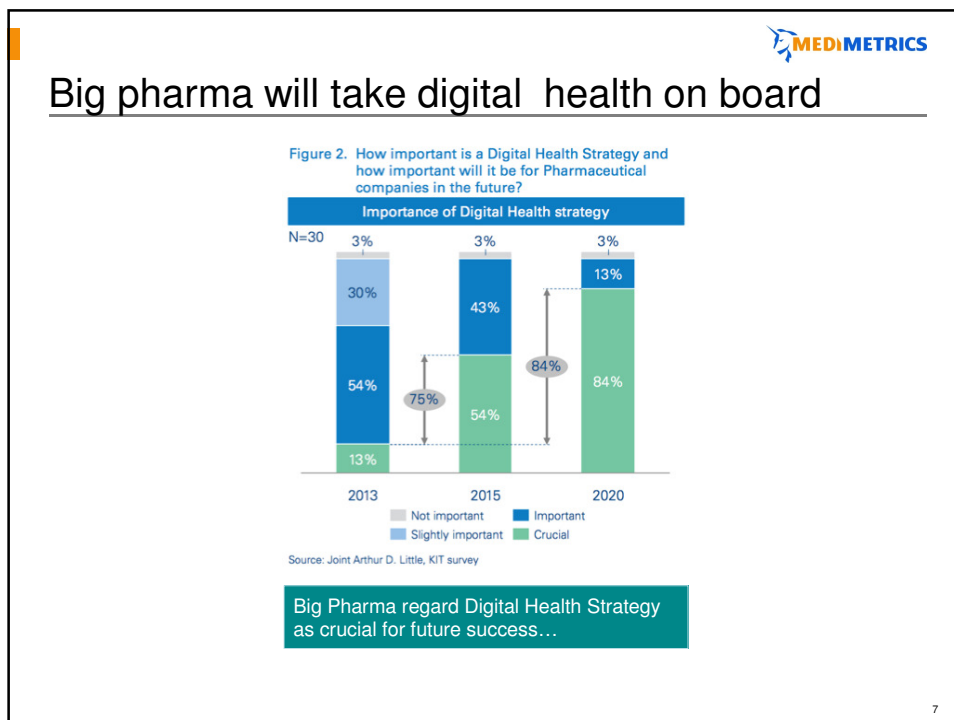
The Health Care Industry is changing dramatically


'Beyond the pill'

Medimetrics can provide
'Outcomes beyond the pill'



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A different species is entering into the Health Care Ecosystem ...

DIGITAL HEALTH

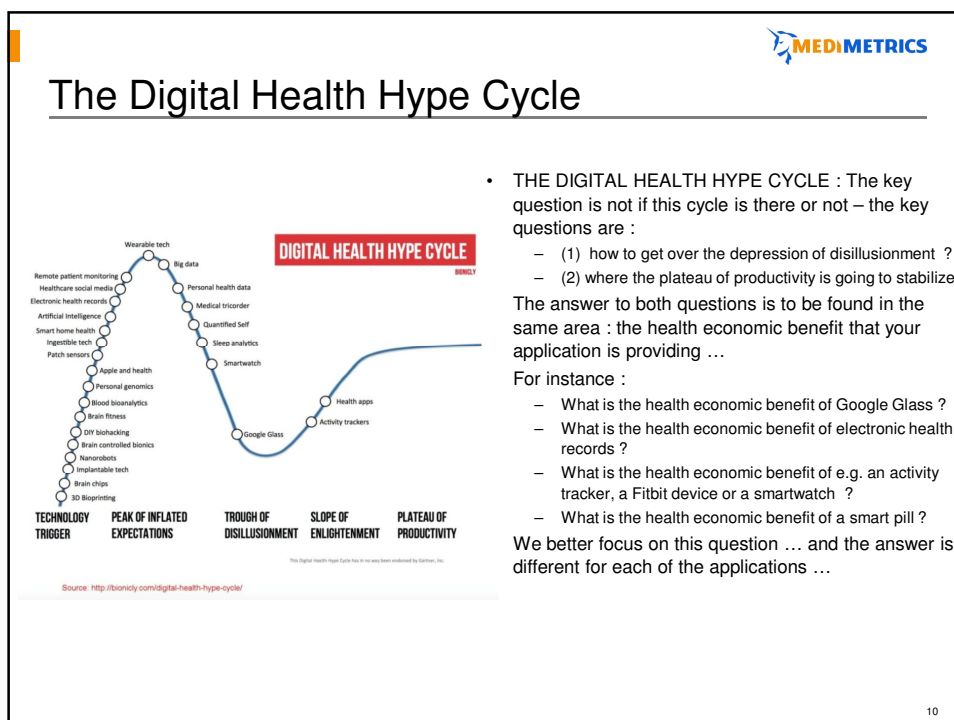
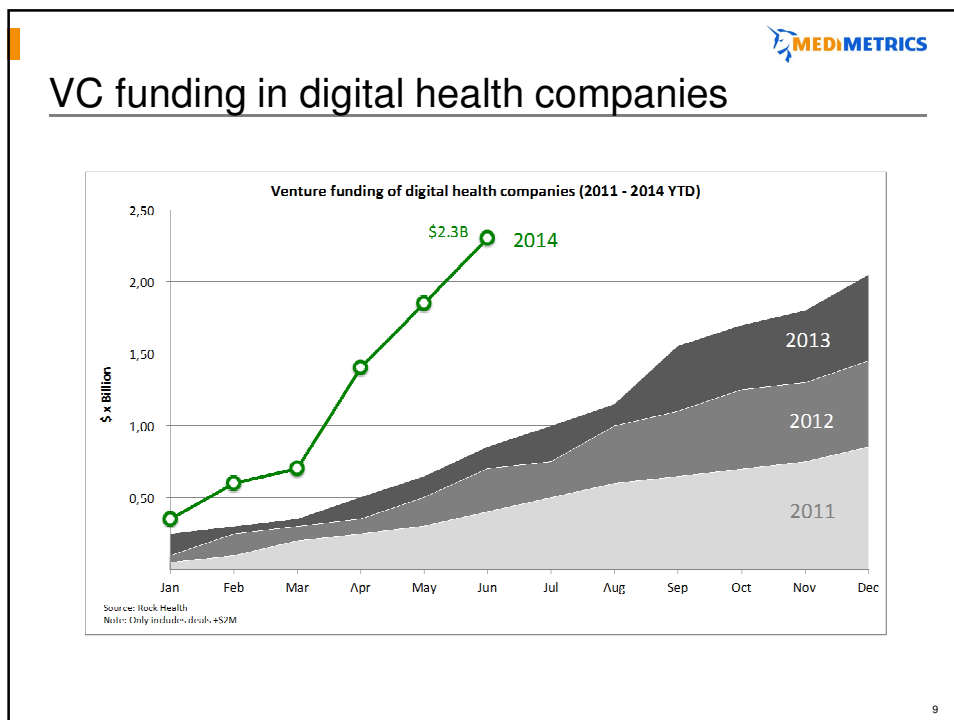
Top 9 Companies Leading The Digital Health In 2015

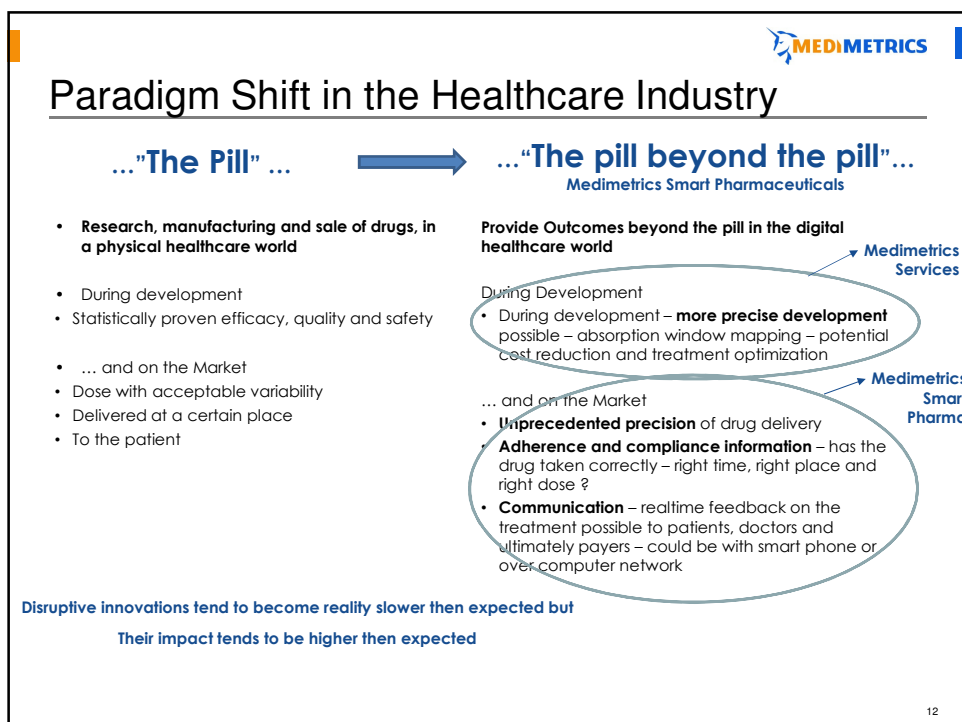
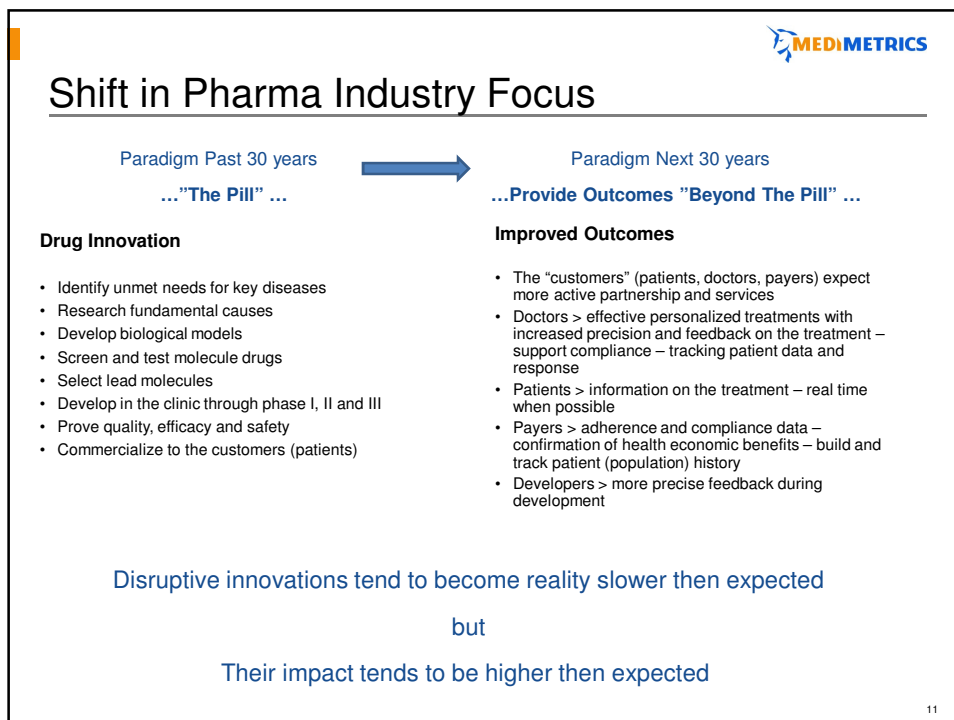
By [Laurenti de' Medici](#)
Posted on 27th August 2015

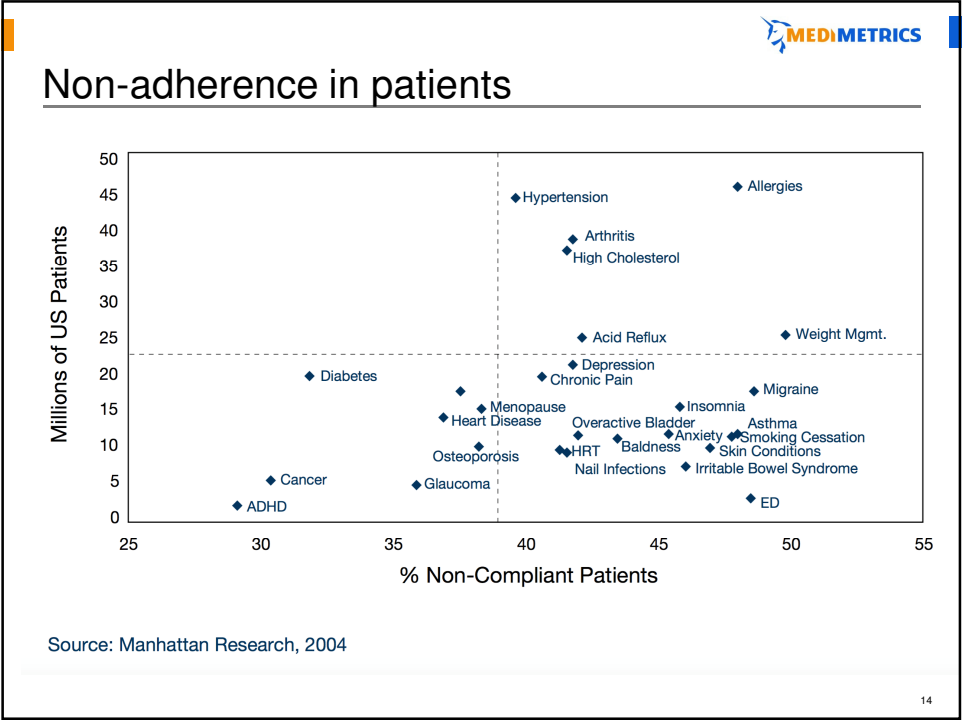
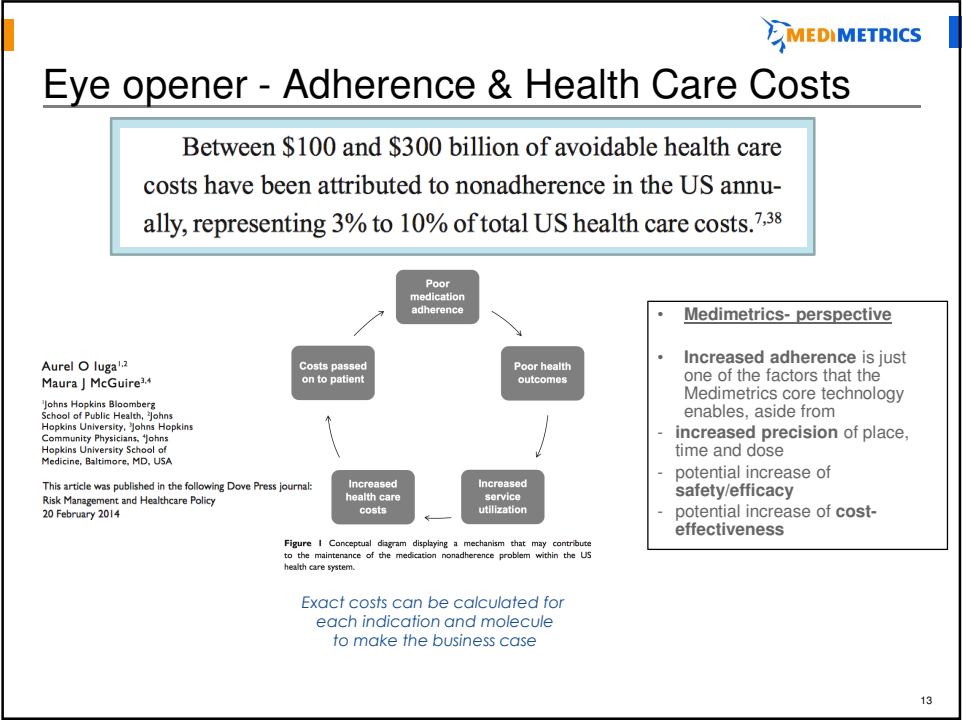
1. **Intel** – digital health foundation
2. **IBM** – personalised medicine
3. **Google** – digital health alphabet
4. **Qualcomm** – connecting devices
5. **Microsoft** – connected health platform
6. **Samsung** – digital health initiative
7. **Apple** – digital health revolution
8. **Philips** – patient relationship management
9. **Amazon** – digital health retailer

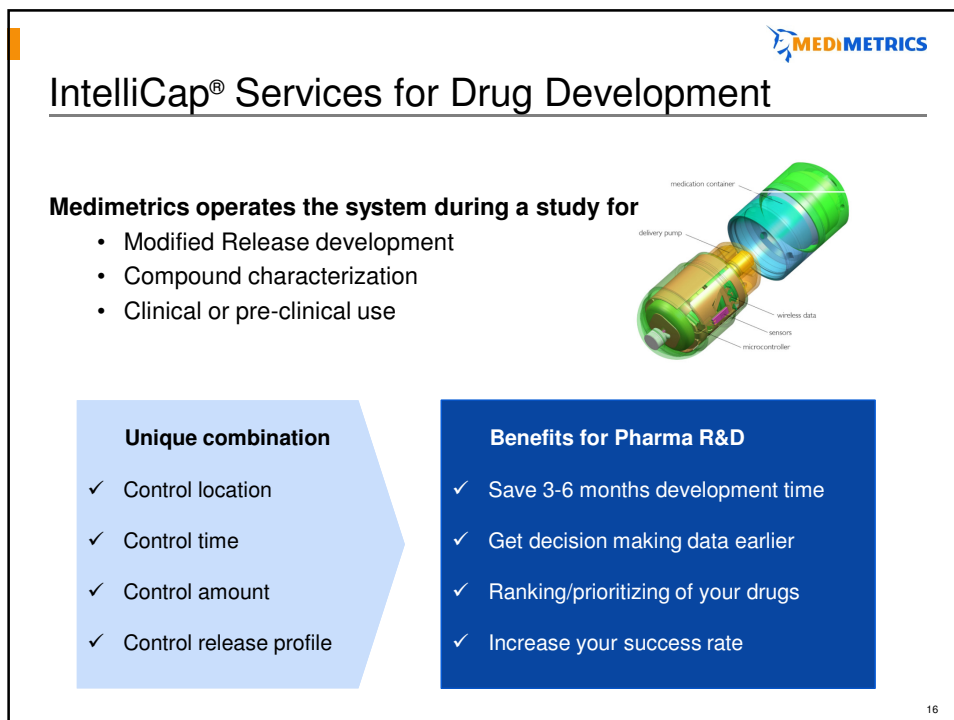
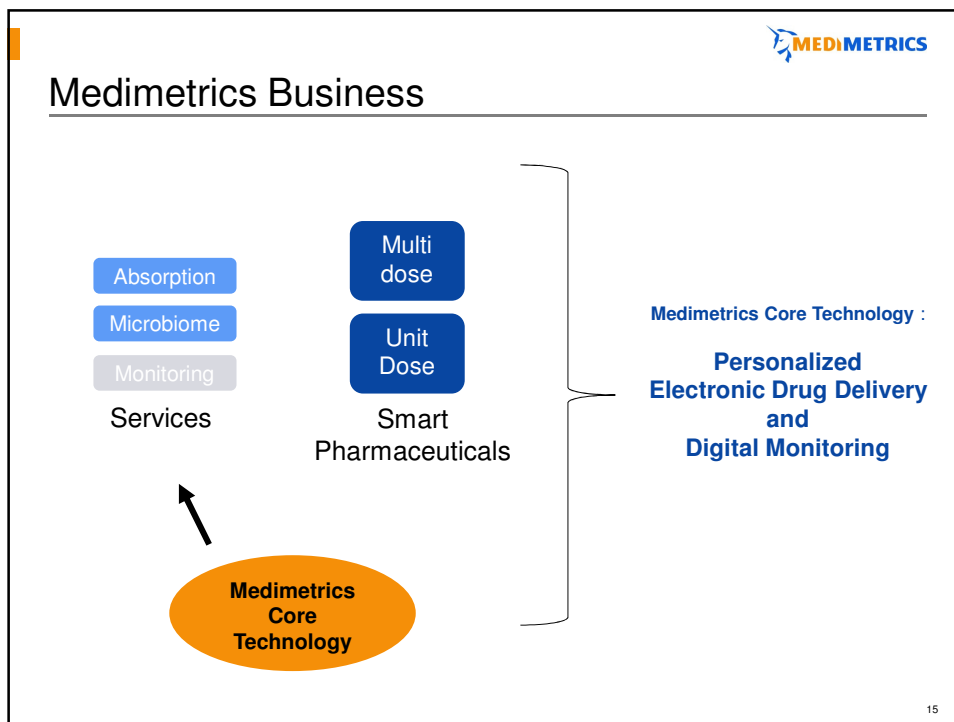
Source = WT Vox : WT VOX is the most trustworthy, authoritative resource in IoT and Wearable Technology landscape and a Top 10 influencer in 2015.

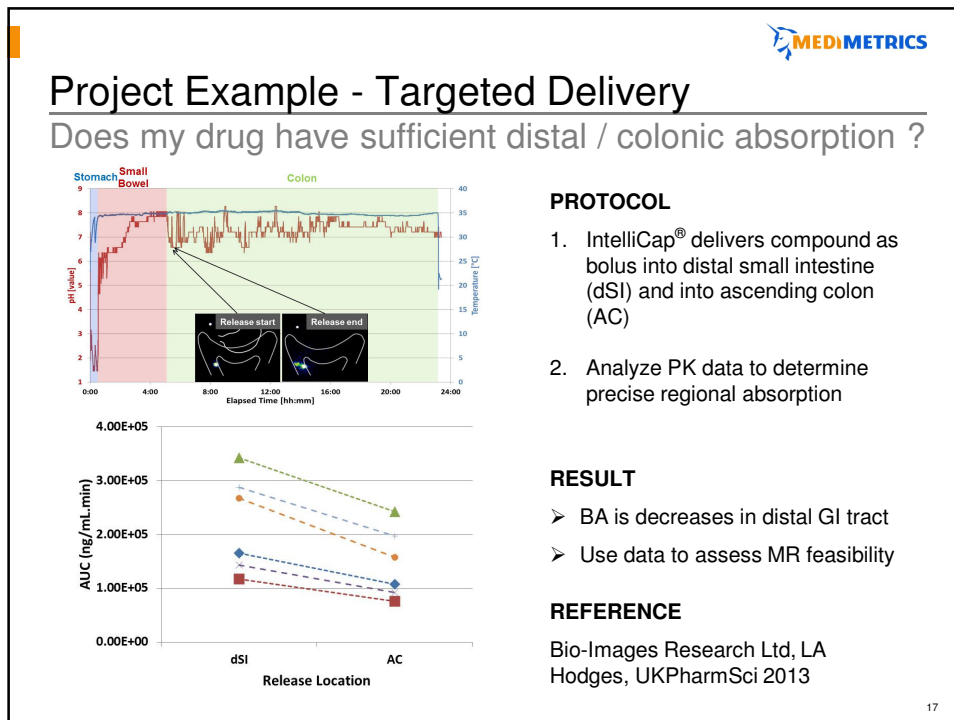
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MEDI METRICS

Gut Health & The Microbiome

A new direction for drug targets and treatments

- Humans possess an extended genome of millions of microbial genes located in the intestines
- The gut microbiome has been connected to
 - Colorectal cancer
 - Cardiovascular disease
 - Diabetes and obesity
- The gut microbiome represents a new frontier for health and disease
- Sampling of small intestines demonstrated with Nizo

NIZO
YOUR FOOD RESEARCHERS

Microbiome Sampling

Exploring the link between the gut microbiome and health

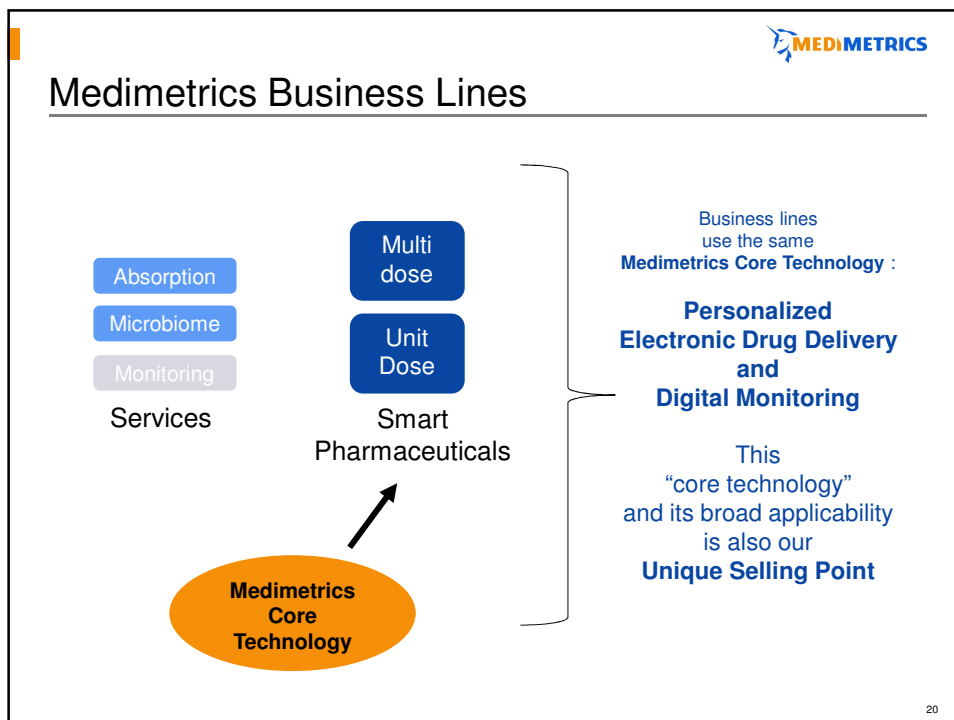
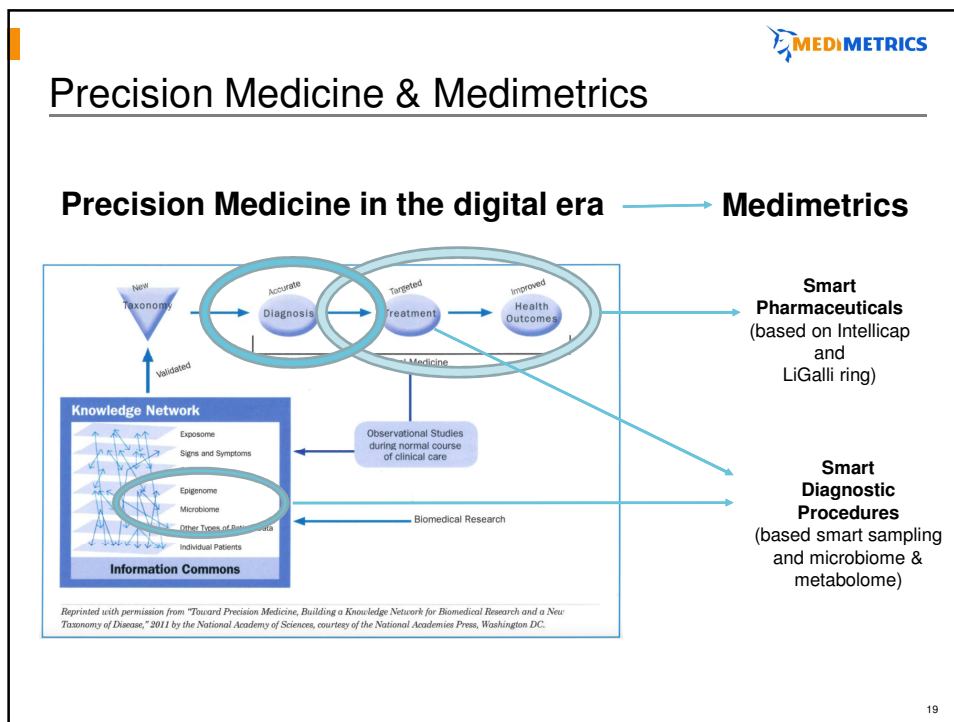
Breakthrough in Non-Invasive sampling


Medimetrics announces successful sampling and profiling of small bowel microbiome with their swallowable IntelliCap® capsule that passes naturally through the digestive system.

Publication of the first clinical study of NIZO food research, Wageningen University and Medimetrics is expected in 2016.

- IntelliCap® CA for sampling
- Electronically controlled capsule
- Fluid aspirator in defined location
- Genetic analysis of contents

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Smart Pharmaceuticals to develop with IntelliCap


Drugs that could benefit well from the IntelliCap

Product	Company	2014 Sales (USD Billion)	Peak Sales (USD Billion)	Indication
Sovaldi (sofosbuvir)	Gilead	9.1	15.4	Hepatitis C
Tecfidera (dimethyl fumarate)	Biogen	3.1	4.6	Multiple Sclerosis
Revlimid (lenalidomide)	Celgene	2.2	9.75	Myeloma Cancer
Gilenya (fingolimod hydrochloride)	Novartis	2.2	4	Multiple Sclerosis
Harvoni (sofosbuvir + ledipasvir)	Gilead	1.5	10.1	Hepatitis C
Zivox (linezolid)	Pfizer	1.4	Peak sales achieved in the past	Hospital-acquired pneumonia infection, Vancomycin-resistant infection
Afinitor (everolimus)	Novartis	1.3	2.51	Breast Cancer
Daklinza (daclatasvir)	Bristol Myers Squibb	0.32	Peak sales not available in secondary research	Hepatitis C
Nexavar (sorafenib)	Bayer	0.5	0.9	Liver Cancer
Stivarga (regorafenib)	Bayer	0.11	Peak sales not available in secondary research	Colorectal Cancer

Marketed Product Candidates
RESULTS OF MARKET STUDY



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Product Case Study –IntelliCap Smart Pharmaceutical

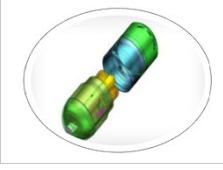
Breast Cancer – business case (Example)

Challenges With BC


- Monitoring response to treatment is a key element in the management of breast cancer¹
- Dose adjustments and poor compliance levels
- Occurrence of side effects such as nausea, vomiting, decreased appetite, weight loss, unusual taste in the mouth, nosebleeds, headache, pain or sores in the mouth
- Drugs are given in combination and response monitoring is essential

Challenges with Product


- Everolimus (Afinitor)
 - Close monitoring for dosing titrations is recommended
 - Low compliance levels
- Palbociclib (Ibrance) Peak Sales: 3.5 bn in 2025
 - Low compliance levels
 - Patient monitoring for side effects and adverse events

Issue	Solution
<ul style="list-style-type: none"> Need for therapeutic drug monitoring to guide subsequent dosing and dose adjustments Side effects and monitoring response to therapy Low compliance 	<ul style="list-style-type: none"> IntelliCap can facilitate dose titrations IntelliCap can help monitor response to therapy for patients and disease progression
Potential	HOW
<ul style="list-style-type: none"> Scope of improving overall success of therapy by response monitoring Cost of per pill administration is high for oral drugs Scope of improving compliance and dosage monitoring 	

Sources: 1. [Graham et al. J Cancer. 2014; 5\(1\): 58-68](#); 2. [Drugs.com](#); 3. [Foulon et al. Acta Clin Belg 2011 Mar-Apr;66\(2\):85-96](#); 4. [Ibrance-Breast cancer.org](#)



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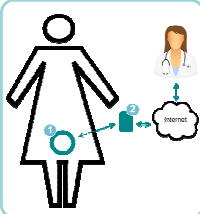


Partnering for Smart Pharmaceuticals

Technology access, licensing, and production


- Unique drug-device combination products
- Medimetrics offers
 - Product definition brainstorming
 - Partner for development
 - License to intellectual property
 - Device design and production

- ✓ Custom designed solutions
- ✓ Low cost delivery platform
- ✓ Exploit “Digital Health”




Example: Intelligent vaginal ring
Partner: LiGalli B.V.




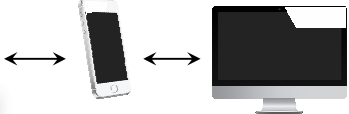
Controlled delivery of drug via the vaginal mucosa, adaptive delivery, sensor integration, wireless data exchange



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LiGalli Intra-vaginal ring

The vaginal mucosa as drug delivery route

- Excellent absorption
- No first pass effect
- Enhanced compliance
- Discrete & non-invasive

Built-in wireless connectivity

- Personal control
- Fully programmable
- Health data capture
- Integrated diagnostics

Innovative LiGalli i-Ring

- Miniaturized electronic drug delivery & diagnostics device
 - Medication reservoir, delivery pump, electronic microcontroller, sensors, wireless communication
- 4 week drug residence
 - Stores hundreds of therapeutic doses
- Programmable and controllable drug delivery
- Patent protected

First application: Overactive bladder (OAB)

- Unmet medical need
- >\$2B market

Empowering female OAB patients to live a normal life

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Conclusions

- Digital technologies are transforming healthcare
 - a new phase of integration between pharmaceuticals and devices is being led by digital technologies
 - leading to “*Connected Drug-Device Combinations*” (“CDDC”s)
 - pharma and device companies will benefit from it
- Medimetrics has a world leading position in electronic drug delivery and monitoring
 - extensive portfolio of patents and publications
- The Medimetrics Technology may be broadly applied to
 - speed oral product development
 - create smart therapeutic products
- Extensive partnering experience
 - top 5 of the top 10 pharmaceutical companies
 - extensive Proof of Technology, in animals and in clinical studies

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Extensive Partnering Experience

Services and Smart Pharmaceuticals

Experience with 5 of top 10 pharmaceutical companies

Experience with mid-size companies and biotech companies

Extensive portfolio of patents and publications

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Electronic Drug Delivery

Medimetrics Vision

*Our company, Medimetrics is committed to **innovating human healthcare.***



*...We believe that making smart use of the **modern digital innovations** will bring a **revolution in healthcare**. We have created a digital device, the **IntelliCap®**, for **smart oral controlled delivery** of drugs. This allows drug development in a more **intelligent** way and enables creation of **smart pharmaceuticals....***

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