

# Corporate Presentation iBiopsy® January 2019



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Median Technologies is listed on Euronext Growth market ISIN: FR0011049824 - ticker: ALMDT

# Transforming imaging data into actionable information





Our Beginning: Pioneering the industry – extracting the most meaning out of medical images



Our Business: Best-in-class technology, including image processing technology, cloud computing & artificial intelligence, leverages the power of **Imaging Phenomics** to improve current treatments, enhance diagnostics and accelerate the development of next generation therapies



Our Growth: Powered by proprietary technology, robust Key Opinion Leader (KOLs) connections and strong medical and scientific partnerships and collaborations



Our People: 100 employees worldwide across Europe, US and Asia; headquarters in Sophia Antipolis, France and offices in Woburn, MA (US), Shanghai and Hong Kong, China

## **AGENDA**



- Part 1: The Market Opportunity
- Part 2: The iBiopsy<sup>®</sup> Solution
- Part 3: Data Acquisition & Market Strategy
- Part 4: Intellectual Property



## Part 1:

The Market Opportunity

## The Demand for Medical Big Data Analytics



## Explosive growth

- With the unprecedented growth in healthcare data, organizations are employing analytical tools, AI, and machine learning to derive data-driven insights in order to:
  - reduce healthcare costs,
  - enhance revenue streams,
  - develop personalized medicine,
  - and manage proactive patient care.
- Big data in healthcare estimated at \$14 billion in 2017 (BIS Research). Market projected to grow to \$68 billion in 2025.
- Healthcare data is projected to exceed 2,314 exabytes by 2020, driven by falling storage costs through cloud-based services and subscription models
- Among components and services, analytics services contributed the lion's share of \$5.80 billion in 2017



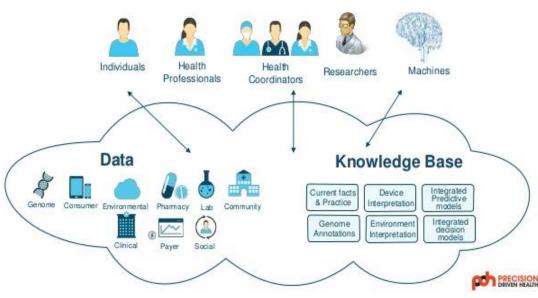
## **Precision Medicine is a data-driven medical process**



To provide the best available care for <u>each</u> individual and refers to the stratification of patients into subsets with a common biological basis of disease

- Health-care industry needs a more comprehensive data approach that uses phenomics, genomics, and imaging data to identify the best treatment for each patient
- Clinicians need tools and clinical data registries for precision medicine
- Biopharma companies need large volumes of data to analyze patient response & identify companion diagnostics

#### Health is becoming a data science



Source: Kevin Ross - Data Driven Health: Precision Medicine and Personalized Healthcare .November 2017



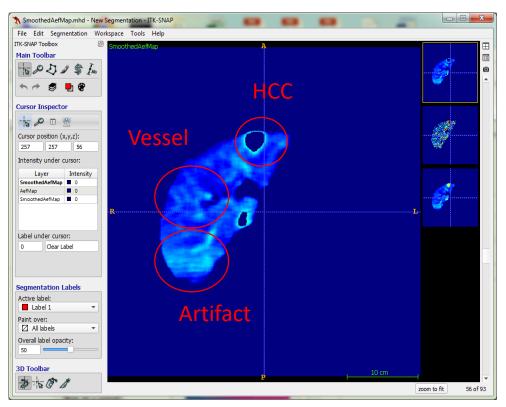
# Part 2: The iBiopsy® Solution

## **Imaging Phenomics**



## Mapping the phenotype using non-invasive imaging

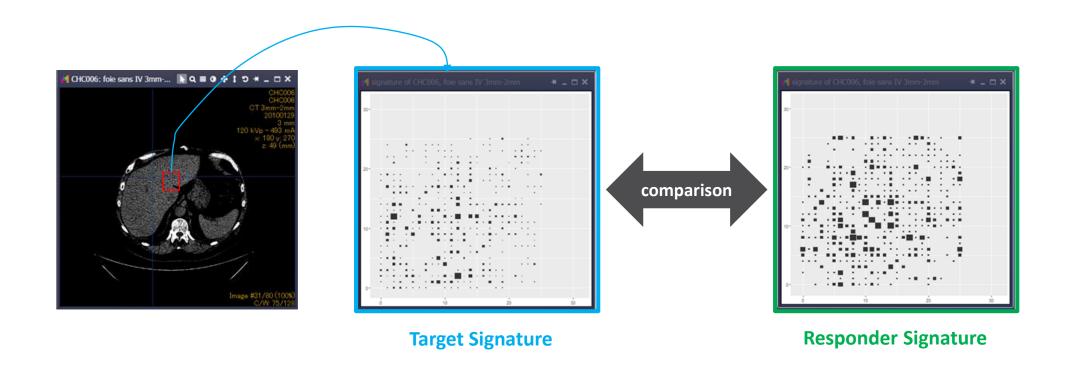
- Scientific evidence supports the hypothesis that genetic and/or molecular alterations within lesions manifest as specific, macroscopic, observable changes in imaging signatures
- Imaging phenomics is the systematic, large scale
   extraction of imaging features for the characterization
   and classification of tissue and disease phenotypes
- Imaging phenomics can prospectively help identify
   patient subtypes that may benefit from specific therapies
- Data driven imaging phenomics are expected to play increasingly important roles in the development and clinical assessment of targeted therapies



ITK/VTK Image Viewer

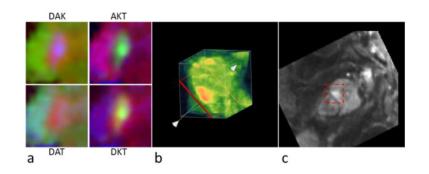
## Comparing Imaging Phenotype Signatures for Treatment Responders vs Non-Responders

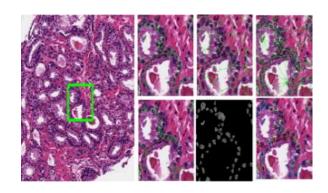


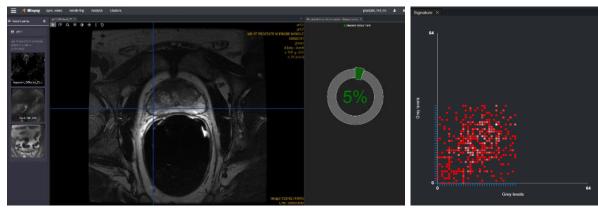




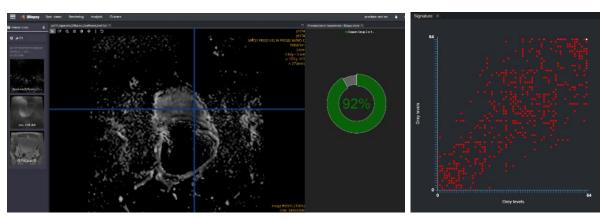
# Biopsy<sup>®</sup> Al applied to cancer diagnosis for clinicians to inform treatment decisions







5% probability this cancer is aggressive



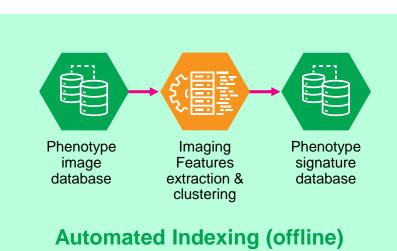
92% probability this cancer is aggressive

## iBiopsy® Platform

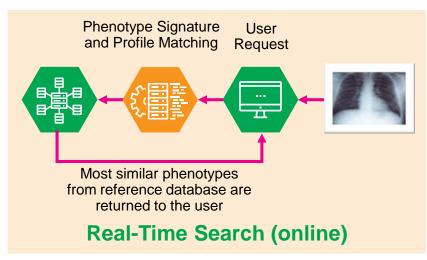


## Proprietary & patented cloud-based AI technology & processes

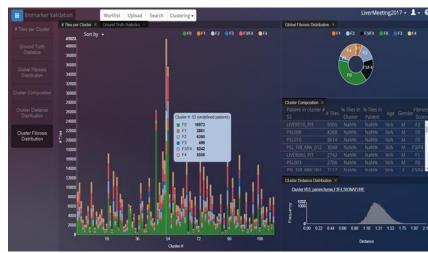
#### **Extraction, Indexing, Search and Data Analytics Platform Component**



**iBiopsy**® totally unsupervised, automatic and asynchronous extractions of features from the images and indexing them in a no-SQL database based on unique similarity metric.



**CyberScan®** performs real-time similarity searches of millions of indexed phenotypes against a target patient phenotype

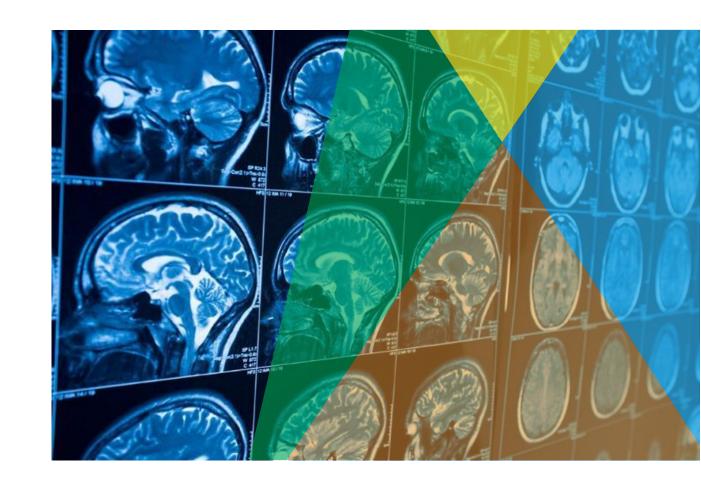


**Sherlock**® is the inferencing engine which provides advanced data analytics, deep learning and advanced clustering to support the detection of abnormal pathology, lesion classification and disease prediction

## **Mapping the Phenotype**



- Screening and early detection of cancers and other chronic diseases
- Monitor patients under treatment
- Patient selection for targeted therapies
- Prediction of responders for IO drugs
- Predict patient prognosis or outcome
- Select patients for clinical trials
- Correlate imaging biomarkers with other markers such as pathology, gene expression, liquid biopsies





## **Part 3:**

## Data Acquisition & Market Strategy

## **Problem Statement**



The lack of availability of large clinical data registries and automated predictive learning methods to identify and characterize the diverse disease phenotypes represents a major barrier for:

- (1) identification of subjects at risk for a variety of cancers and chronic diseases eligible for pharmacological intervention and therefore for better patient selection in clinical trials, and
- (2) availability of inexpensive diagnostic and prognostic methods once effective therapies are approved (precision medicine for the individual patient).

#### There is an urgent need for:

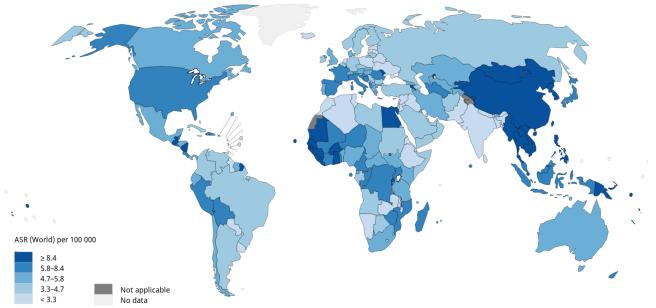
- (1) the assembling of large, curated clinical and image data registries and
- (2) robust, unsupervised AI methods that will reliably predict the diagnosis of cancer and other chronic diseases, as well as predict outcome to guide therapy based on specific disease subtypes.

## First approach: Hepatocellular Carcinoma



- Most common primary hepatic tumor (over 90% of all primary liver cancers) and one of the most common cancers worldwide.
- Diagnosis of HCC, mainly based on imaging
- Unfavorable prognosis when diagnosed at a late stage because therapeutic approaches are limited.
- Risk factors for the development of HCC are chronic viral hepatitis infection, alcoholic and non-alcoholic fatty liver disease, and other types of chronic inflammatory liver diseases
- Hepatitis C and B infection are the leading cause of HCC development globally
- Given the highly complex genomic aberrations and tumor microenvironment in HCC, it is challenging to elucidate how the mechanism of molecular targeted agents kills HCC cells.





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Data source: GLOBOCAN 2018 Graph production: IARC (http://gco.iarc.fr/today) World Health Organization



## **HCC Registry Objectives**



#### **First Objective**

Acquire a large (several thousand patients)
CDR in order to rigorously *validate* candidate
phenotype signatures of HCC tumor
subtypes

#### **Second Objective**

Augment the CDR with external unlabeled databases and synthetic cases to improve prediction in under-represented patient populations

#### **Goals:**

- Demonstrate the ability to use advanced AI methodologies and large scale deeply phenotyped clinical data registries to accurately identify the specific HCC subtypes to better diagnose and predict patient outcome in liver cancer.
- Identification of appropriate patient populations, who might respond to specific molecular pathways targeting the various disease subtypes, so as to bring right treatments to the right people.

## **Broad Sector Market** – Precision Medicine & Healthcare Tech



## \$141.70 billion\*

**Global precision medicine market** 

Oncology is the dominating therapeutic application segment and is expected to grow with a CAGR of 10.44% from 2017 to 2026; it is currently the prime focus in the research and development of precision medicine

Healthcare Market



BioPharma Market



Addressed through

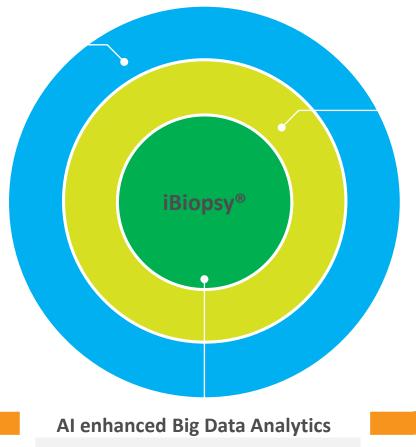


Image-Based Phenotyping platform with disease focused registry database for Precision Medicine

\$49.50 billion\*

**Healthcare Technology market** 

Technologies such companion diagnostics, pharmacogenomics, bioinformatics, and big data analytics are foreseen to drive the market growth during the forecast period

Healthcare Market



BioPharma Market



Addressed through

[\*] Source: BIS Research, Dec 15 2017 – segment growth 2017-2026

## iBiopsy® Platform – Product Strategy Map



Markets & Products/Applications



>\$1.6B
Healthcare Market

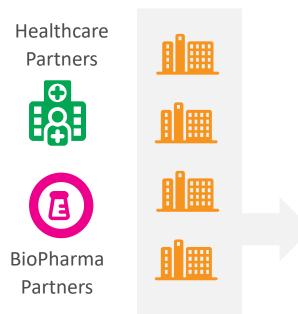
- 1. Registry annual subscriptions Large & Small
- 2. Predictive Searches for decision support
- CDx test for routine care.

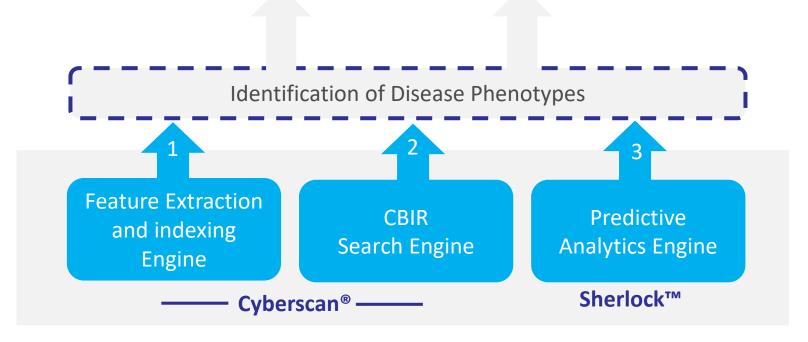
**Targets for Precision Medicine** 

4. Open Source License for academic research

**Targets for Drug Development** 

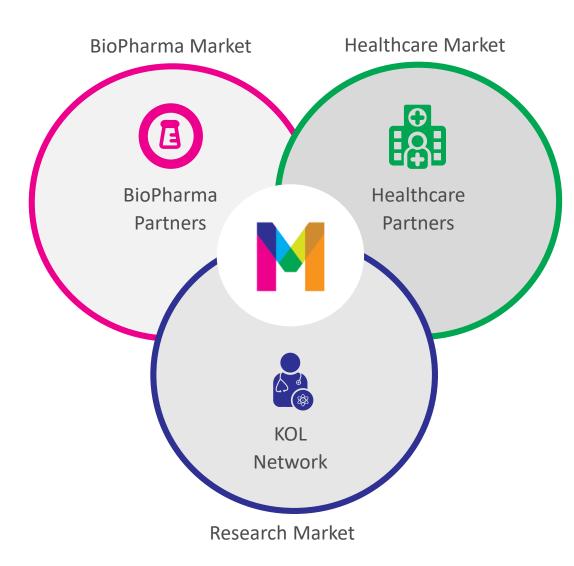
**Data Acquisition** 





## **Competitive Advantage**





#### Not just a Data Driven approach:

Unlike the majority of our comparables, Median brings multiple complementary approaches

#### **Channel to market:**

Median is uniquely placed with its existing business sitting across 3 key market segments delivering established relationships, collaborations & sales channels



#### Science & Big Data:

Combined a Big Data + Imaging Phenomics approach is both unique and highly novel



#### Al is in our DNA:

Median has always been developing Artificial Intelligence – this is not a new area but the foundation of our business and technology

## **Precision Medicine Market Segmentation**



By Technology By Therapeutic Area

By Geography

Big Data Analytics

Oncology

North America

Bioinformatics

Immunology

Europe

**Drug Discovery** 

CNS

Asia

Companion Diagnostics

Respiratory

Median Technologies is well positioned to immediately address the majority of this market:

- ✓ Our DNA is technology
- Our Focus is Oncology
- ✓ Our Experience is World Wide

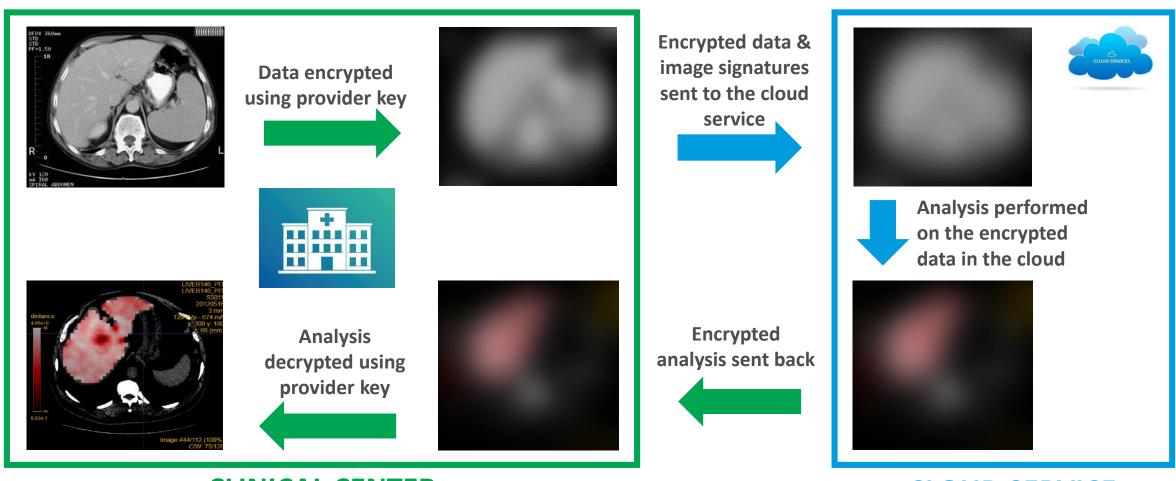
Gene Sequencing

Given the platform's flexibility it could be applied to the missing 3 areas in the future

## **Unique Data Privacy Model – Homomorphic Encryption**



iBiopsy® operates directly on encrypted data ensuring no leakage of private health information or test results



**CLINICAL CENTER** 

**CLOUD SERVICE** 

## **Comparables & Competition**



Although it is fair to state that the iBiopsy® platform has no current direct competition offering similar applications and utility, the companies who are more broadly comparable, developing AI-enhanced data driven technologies built off the acquisition and curation of large-scale database and registries – facilitating the application of Big Data to clinical healthcare can be seen below:

		Year Founded	Funding Raised	Current Valuation	Annual Revenues
	Flatiron Health	2012	\$313M (3 rounds)	\$2.10B*	\$2.9M
	Tempus	2015	\$320M (7 rounds)	\$1.98B	\$1.7M
	Adaptive Biotechnologies	2009	\$411M (8 rounds)	\$0.85B	\$7.7M
	Grail	2015	\$1.6B (3 rounds)	\$3.20B	\$3M

<sup>\*</sup>Acquired by Roche 2018 Source: Owler 2018

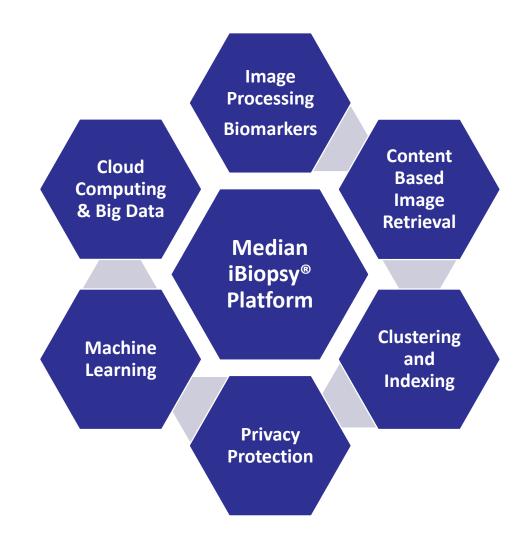


# Part 4: Intellectual Property

## **Intellectual Property Strategy**



- Median Technologies has a very active intellectual property program
- The iBiopsy® platform is currently covered by US Patent 9,092,691 issued 7/15/2015
- 10+ patents pending
- Picket Fence Strategy: Six Core Areas
- Global Patenting Strategy: US, EU, Japan and China
- Accelerated Examinations in six months





#### Our Core Values

#### **Leading innovation with purpose**

Combine the spirit of innovation with our passion and conviction to help cure cancer and other debilitating diseases.

#### Committing to quality in all we do

Be dedicated to quality in everything we do. Quality begins with us and we are committed to it.

#### **Supporting our customers in achieving their goals**

Listen to the needs of our customers and help make their goals our goals through our innovation, imaging expertise, superior services and quality solutions.

#### **Putting the patient first**

There is a person at the other end of the images we analyze who is counting on us to do everything we can to help make them healthier.



