Q PATHOLOGY

A GLOBAL ECOSYSTEM FOR PRECISION MEDICINE

Connecting Patients, World-Class Hospitals, Physicians, BioMedical Companies, Academia and Researchers

QPATHOLOGY (QPath) ECOSYSTEM FOR PRECISION MEDICINE
Patient First: Best Quality and Trust

PROBLEMS

1. Patient Specimens - Tissue Microarray Biobanks: High prices, lack of pathology reports and/or follow-up data (information on the patients' outcome).

2. New BioMedical Technologies: Recent cutting-edge biomedical technologies and procedures are not available to all research/clinical laboratories.

3. BioMedical Data: Acute need of medical data for AI/Machine Learning-based Precision Diagnosis, Drug Repurposing & Companion Diagnostic Development.

4. Patient referral: An inefficient referral system to enable international patients/physicians to privately avail the expert opinion and services of the world-class hospitals, their physicians and telemedicine platforms that they use.

SOLUTIONS

1. Tissue Microarray BIOBANK will offer significantly lower prices, anonymized pathology reports, patient outcome information; high quality, diversified, strongly advertised.

2. A wide array of **unique cutting-edge technologies** developed by QPath members will be commercialized and provided as services to research/clinical labs & patients.

3. *Blockchain*-**based collaborative & marketplace platform** designed for secure & decentralized biomedical information exchange, digital pathology & worldwide pathology services.

4. Patient referral platform privately connects worldwide patients/doctors with the world leading state-of-the-art hospitals & telemedicine platforms that they use, for best diagnosis, 2nd opinion and treatment.

PROBLEM:

High prices, regional distribution, lack of a pathology report and/or follow-up data (information on the patients' outcome) for Tissue Microarrays (TMAs)

Several COMPANIES offer TMAs sections at an average price >$250/section.
If for each block 40 sections are obtained, an entire block is sold for ~$10,000!!!
(price/tissue section = $40 to >$1000)

Part of the HOSPITALS/UNIVERSITIES offer TMA services (develop TMA blocks/sections from your own specimens), but only few of them have a TMA Biobank.
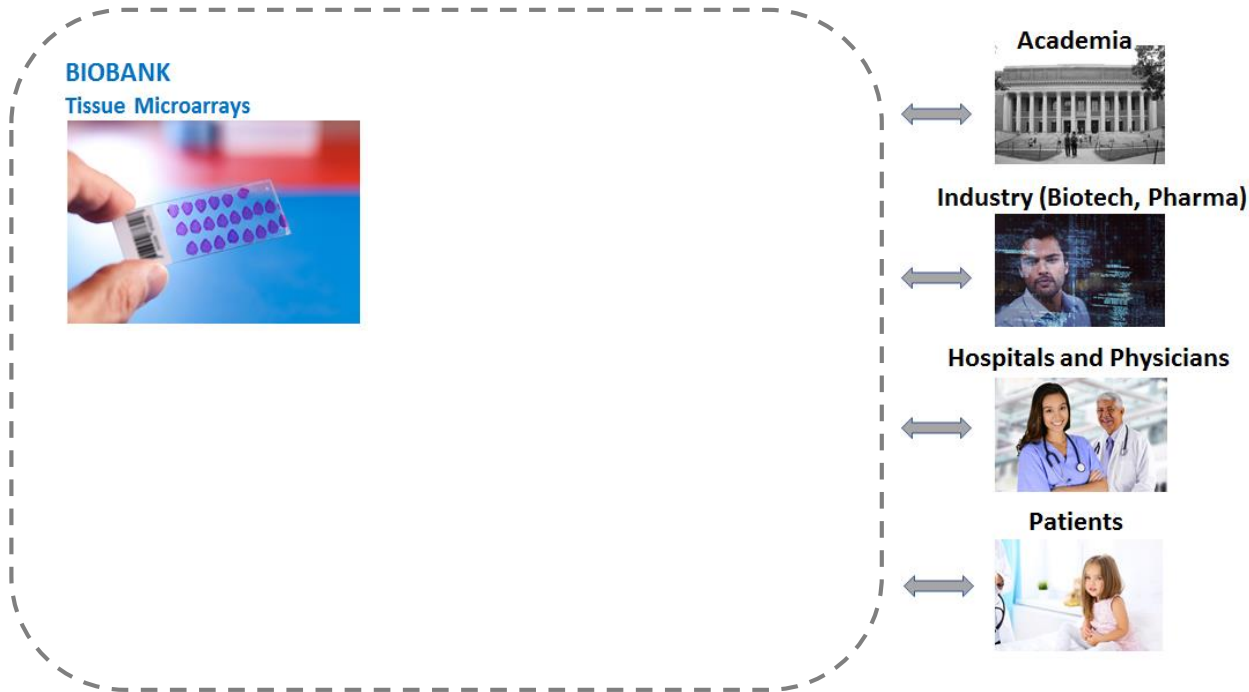
These TMA Biobanks are smaller scale, have lower diversifications and are poorly advertised compared with the for-profit companies (and the price is still high).

SOLUTION: Create a Tissue Microarray Biobank with anonymized pathology reports and follow-up data, significantly lower prices, diversified and strongly advertised

QPathology

PROBLEM: Many new cutting-edge biomedical technologies and procedures are not available to all research/clinical laboratories and patients

PATHOLOGY

New Cutting-edge Technologies

(e.g, Expansion Pathology, Muscle-on-a-Chip, NanoThermometry)

Directly learnt by laboratories

◊ **Cons:** harder to implement, requires time to learn, troubleshoot, a paid researcher
◊ **Pros:** it can be applied on a regular basis

Provided as SERVICE by the developers

◊ **Pros:** can be immediately tested and applied, no need for troubleshooting; paid fee-for-service may be lower than the salary of a researcher

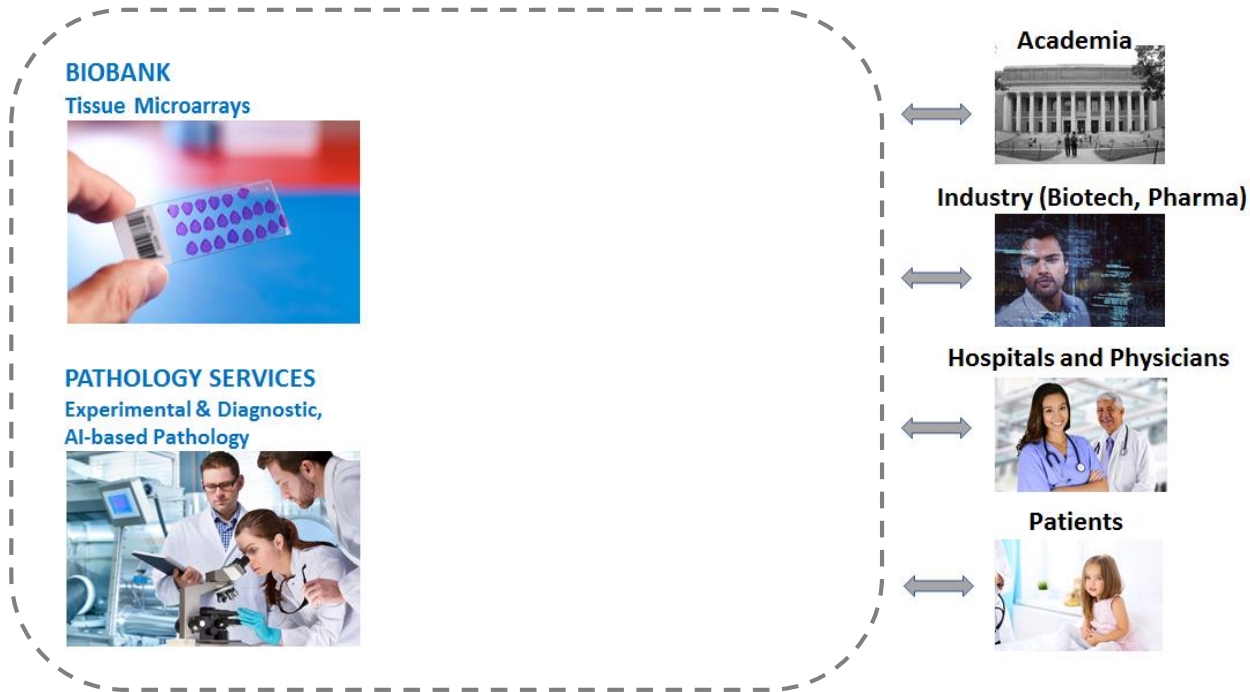**Early use by Pathology Research Laboratories**

Development of better Diagnosis & Treatments options

5

SOLUTION:
Provide several unique cutting-edge technologies developed by our members and partners as SERVICES

PATHOLOGY

QPathology

BIOBANK
Tissue Microarrays

PATHOLOGY SERVICES
Experimental & Diagnostic, AI-based Pathology

Academia

Industry (Biotech, Pharma)

Hospitals and Physicians

Patients

PROBLEM: Lack of a collaborative and marketplace platform for Biomedical Information Exchange and Worldwide Pathology Services

Q PATHOLOGY

PROVIDERS

Hospitals and Physicians
Academia/Research Labs
Industry
Patients

Unavailable
Collaborative and Marketplace Platform for Biomedical Information Exchange & Worldwide Pathology Services

BENEFICIARIES

Hospitals and Physicians
Academia/Research Labs
Industry
Patients

Acute need of medical data for:

AI/Machine Learning-based Precision Diagnosis, Risk Prediction, Patient Survival Assessment, Drug Repurposing and Companion Diagnostic Development

SOLUTION: Develop QPath blockchain-based collaborative platform for secure and decentralized Biomedical Information Exchange, Digital Pathology and Pathology Services

PATHOLOGY

PROVIDERS

Hospitals, Physicians, Patients

Universities/Academia

Industry

Secure
Decentralized
Fast, Cheap International Payments

Blockchain-based Platform

BENEFICIARIES

Hospitals, Physicians, Patients

Universities/Academia

Industry

QPath collaborative and marketplace platform for Pathology Services and Information Exchange

PROBLEM:

WIRE TRANSFER

~ $25 (transfers within USA: $0-$50)
> $30 typically (transfer outside of USA)
◊ *Pros:* secure transfer
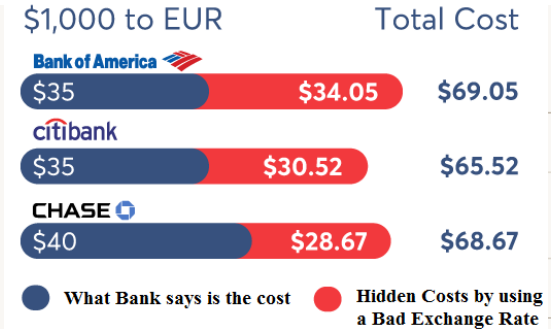◊ *Cons:* very slow (~1-3 days!!!), high fees

CHASE

$45 fee at branch or $40 online (outside of USA)

$1,000 to EUR — Total Cost

Bank	What Bank says is the cost	Hidden Costs by using a Bad Exchange Rate	Total Cost
Bank of America	$35	$34.05	$69.05
citibank	$35	$30.52	$65.52
CHASE	$40	$28.67	$68.67

Adapted from transferwise.com

PayPal

Beneficiary: 2.9% plus $0.30 USD of the amount you receive (USA)
Provider: free
◊ *Pros:* fast, free for the Provider; better than Wire Transfer for small amounts transferred
◊ *Cons:* 2.9% + $0.30 of the received amount for Provider (29$ for $1000; $145 for $5000);

SOLUTION: Blockchain technology enables Secure Peer to Peer (P2P) Transactions, Cheap and Fast International Payments

using Digital Assets

PROVIDERS ⟷ BENEFICIARIES

Hospitals, Physicians, Patients

Universities/Academia

Industry

Secure
Decentralized
Fast, Cheap International Payments

Blockchain-based Platform

Hospitals, Physicians, Patients

Universities/Academia

Industry

QPath collaborative & marketplace platform for Pathology Services and Information Exchange
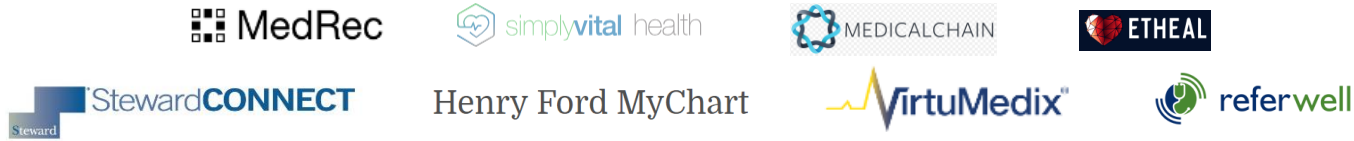
Payments in seconds/minutes and significantly lower fees

Transparent and Independent of the Exchange Rates of Banks (e.g. USD - EURO)

PROBLEM: Inefficient referral system to enable international patients/physicians to privately avail the expert opinion and services of the world-class hospitals

PATHOLOGY

Many platforms trying to connect patients with physicians and hospitals exist:

MedRec   simplyvital health   MEDICALCHAIN   ETHEAL

StewardCONNECT   Henry Ford MyChart   VirtuMedix   referwell

However most of the patients do not know that such platforms are available,
and (to our knowledge), there are no available platforms referring worldwide patients only to leading hospitals for best possible diagnosis, 2nd opinion & therapy

SOLUTION: Connect worldwide patients/doctors with the world leading state-of-the-art Hospitals and the telemedicine platforms that they use

PATHOLOGY

Potential PROVIDERS

Harvard Affiliated Hospitals

Beth Israel Deaconess Medical Center

Brigham and Woman's Hospital

Dana Farber Cancer Center

Boston Children's Hospital

Massachusetts General Hospital

PATHOLOGY

QPath Patient Referral Platform
enabling State-of-the-Art
2nd Opinion, Diagnosis and Treatment

BENEFICIARIES

PATIENTS, Hospitals, Physicians

STRATEGY

RESEARCH & DEVELOPMENT

◊ Continuous progress and development as a cutting-edge biomedical facility
◊ Funding for several research laboratories

Multipurpose TMA BIOBANK

Develop and maintain a biobank of formalin fixed TMAs; low prices, high quality, anonymized pathology reports & follow-up data:

◊ unique position, quick implementation
◊ long expertise in TMA development
◊ collaborate with BIDMC physicians (access to a significant number of specimens)

COLLABORATIVE PLATFORM

Blockchain-based, secure and decentralized
◊ biomedical information exchange
◊ global pathology services
◊ digital pathology

Designed as a collaborative crowdsourcing platform and marketplace for biomedical information and pathology services
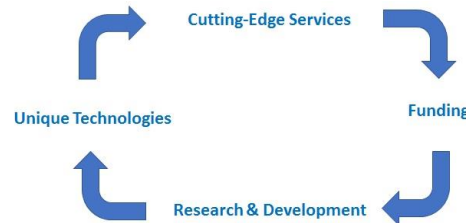
PATHOLOGY SERVICES

Provide Cutting-edge Diagnostic & Research Services using UNIQUE technologies developed by our own members and our partners:

◊ *NanoThermometry, Nano pH (*Founder B. Jena)
◊ *Expansion Pathology (*Founder O. Bucur)
◊ *Muscle on-a-chip* (Founder B. Jena)

SECOND OPINION PLATFORM

Privately connects worldwide patients/doctors with the world leading state-of-the-art Hospitals and the telemedicine platforms that they use, for BEST diagnosis and treatment.

QPathology

BIOBANK
Tissue Microarrays

PATHOLOGY SERVICES
Experimental & Diagnostic,
AI-based Pathology

COLLABORATIVE Platform

Powered by Blockchain

REFERRAL Platform

Cutting-Edge Services

Unique Technologies

Funding

Research & Development

CUSTOMERS AND REVENUE MODEL

TMA BIOBANK

CUSTOMERS: Industry, Academia, Hospitals, Clinical & Research Laboratories
REVENUE MODEL:
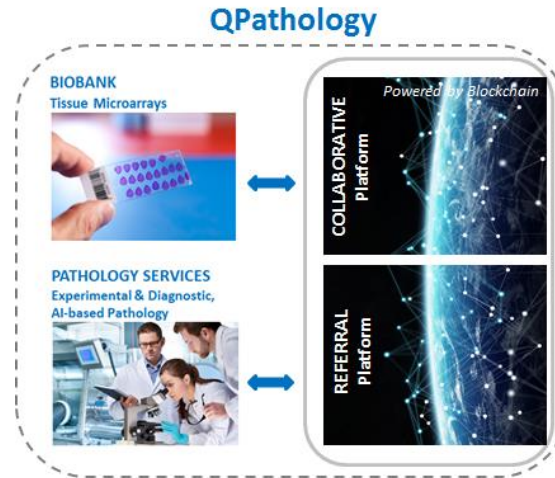◊ Production model (for the Biobank);
◊ Fee/Pay for Service model for the TMA development offered as a Service

COLLABORATIVE PLATFORM

CUSTOMERS: Industry, Academia, Hospitals, Physicians, Researchers
REVENUE MODEL:
◊ Advertising model; No fee for transactions to stimulate an open environment

QPathology

BIOBANK
Tissue Microarrays

PATHOLOGY SERVICES
Experimental & Diagnostic, AI-based Pathology

COLLABORATIVE Platform

Powered by Blockchain

REFERRAL Platform

PATHOLOGY SERVICES

CUSTOMERS: Industry, Academia, Hospitals, Patients; Clinical & Research Laboratories
REVENUE MODEL:
◊ Fee/Pay for Service model

SECOND OPINION PLATFORM

CUSTOMERS: Patients (potential Hospitals and Physicians)
REVENUE MODEL:
◊ Commission model (fee for transactions)

PATHOLOGY

14

MARKET SIZE

TMA BIOBANK

Current global market value
◊ TMA biobanking: $220 Billion (2016)
Forecast market value
◊ **CAGR 10.8%-13.7% by 2023!** (>$300 Billion)

DigitalJournal   MarketResearchFuture

PATHOLOGY SERVICES

Current global market value
◊ Anatomic Pathology: $20 Billion (2017)
◊ All Pathology Services: > $25 Billion
Forecast market value:
◊ Anatomic Pathology: **CAGR 6.5% by 2025!**

GlobeNewsWire

QPathology

BIOBANK
Tissue Microarrays

PATHOLOGY SERVICES
Experimental & Diagnostic,
AI-based Pathology

Powered by Blockchain

COLLABORATIVE Platform

REFERRAL Platform

COLLABORATIVE PLATFORM

Current global market value
◊ Digital Medical Ads: **$**2 Billion (2017)
Forecast market value:
◊ **CAGR 13% by 2020!** (> $3 Billion)

eMarketer

SECOND OPINION PLATFORM

Current global market value
◊ Telemedicine: > $25 Billion (2017)
Forecast market value:
◊ **CAGR 18% by 2025!** (> $100 Billion)
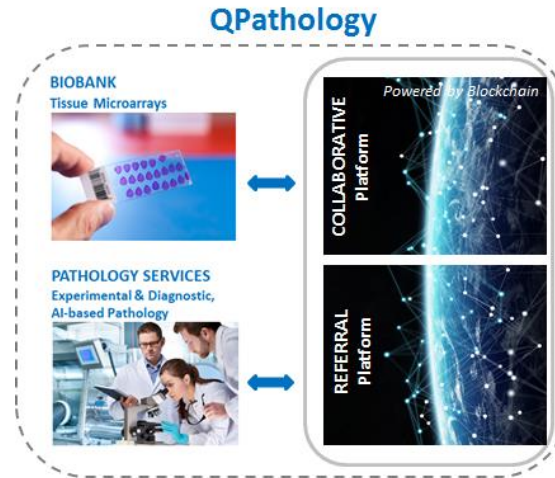
Statista   GrandViewResearch

15

GO TO MARKET

TMA BIOBANK

◊ Already interested laboratories within the Boston area
◊ Collaborative Platform for advertisement
◊ *Proof of concept:* MA → USA → go global

PATHOLOGY SERVICES

◊ Already interested laboratories within the Boston area
◊ Collaborative Platform for advertisement
◊ *Proof of concept: Boston, MA area & USA → go global*

COLLABORATIVE PLATFORM

Proof of concept: our own Pathology Services, Biobank, services from Partners → Core Facilities, clinical/research labs from top US medical institutions
→ go global by focusing on top academic & industry entities from each country

SECOND OPINION PLATFORM

◊ Partner with or develop strategic referral centers
◊ Partner with Best Hospitals/Physicians
◊ *Proof of concept:* India and East Europe → go global