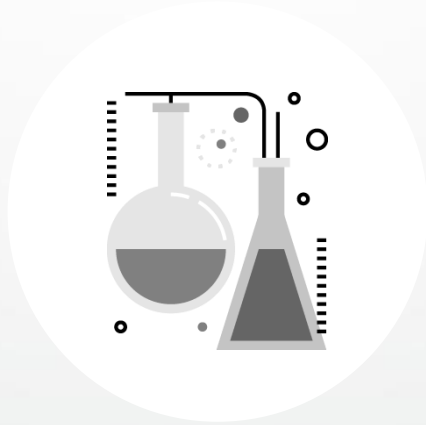




# A polymer platform technology company

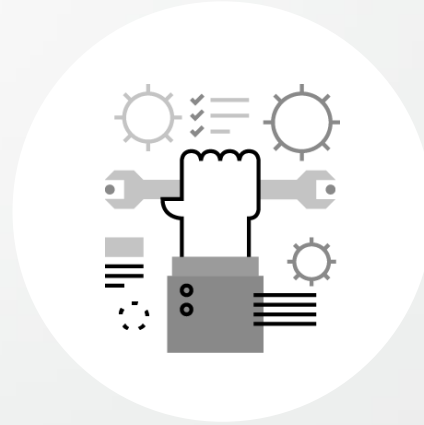
January 2020

# Introduction



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**M.M.A Tech** has developed a highly **durable** and **self-lubricating** bio-polymer **MP-1™** with **modulus close to bone**



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**MP-1™** exhibits a superior **combination** of strength, toughness, wear, creep and fatigue resistance for the orthopedic field

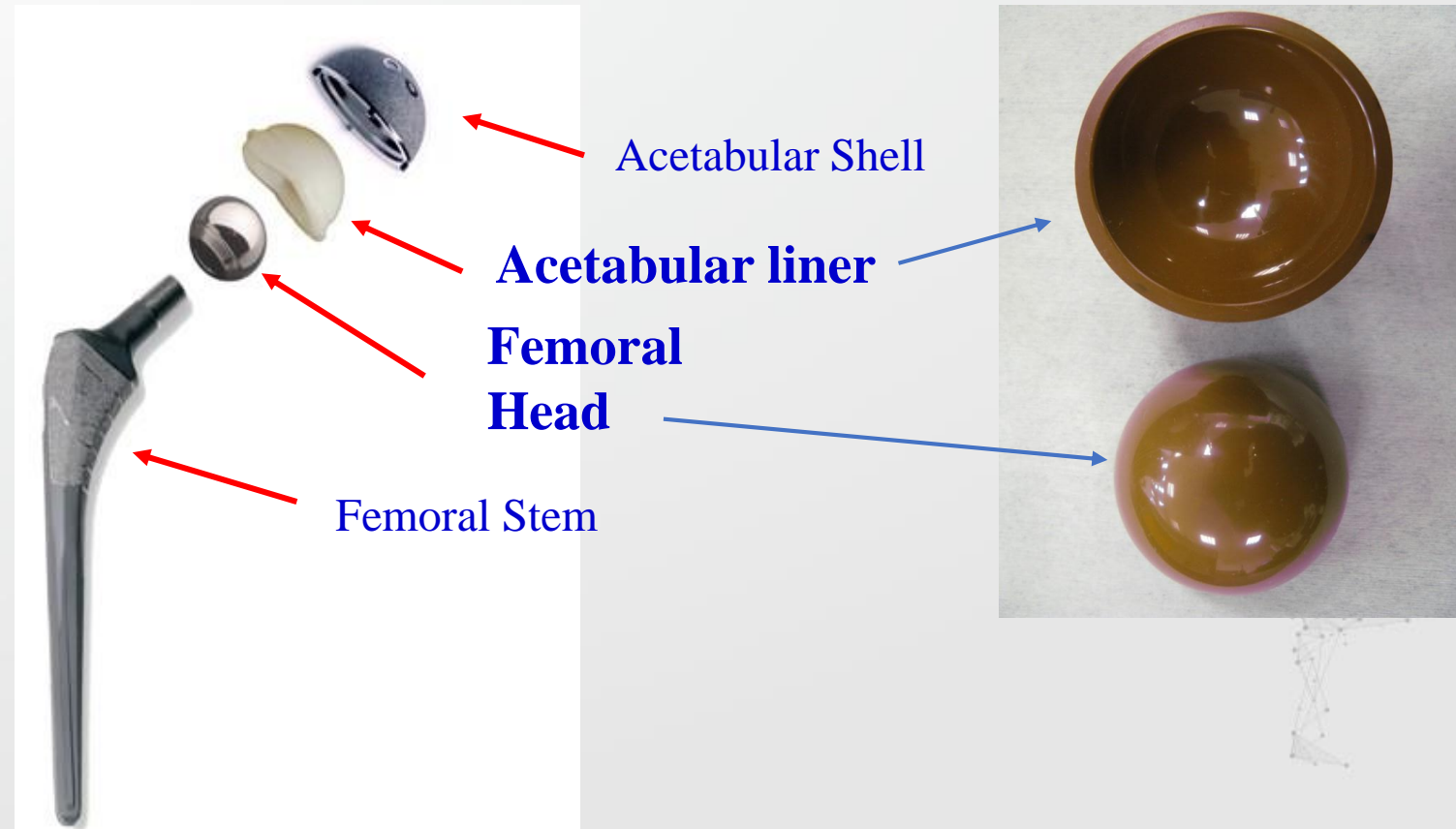


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The **MP-1™** is a modification for medical application of the polymer developed in **NASA** for the aerospace industry

# The Solution:

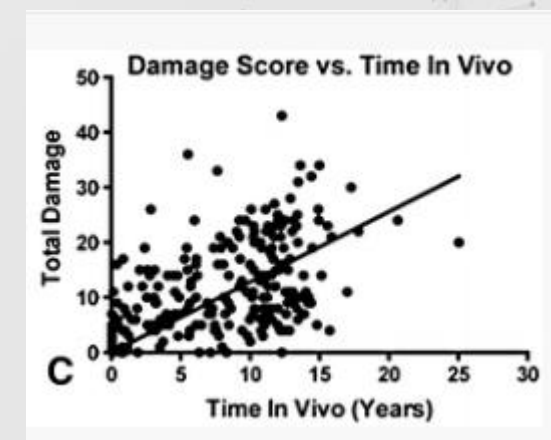
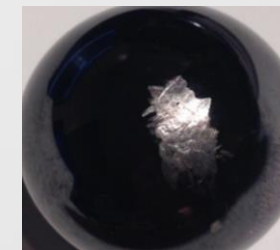
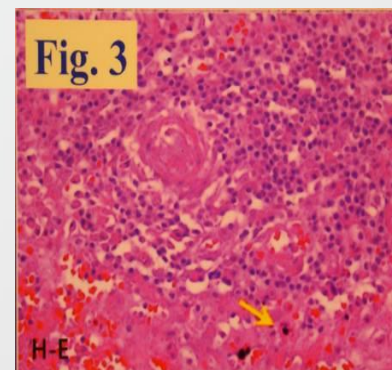
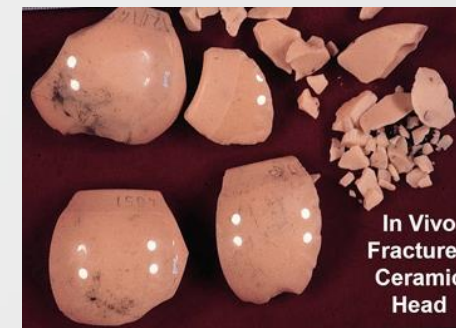
## First Product: MP-1™ Acetabular liner and Femoral Ball Total Hip Implant



# The Need

## CURRENT HIP IMPLANTS:

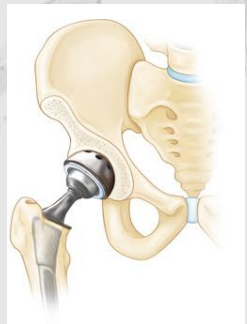
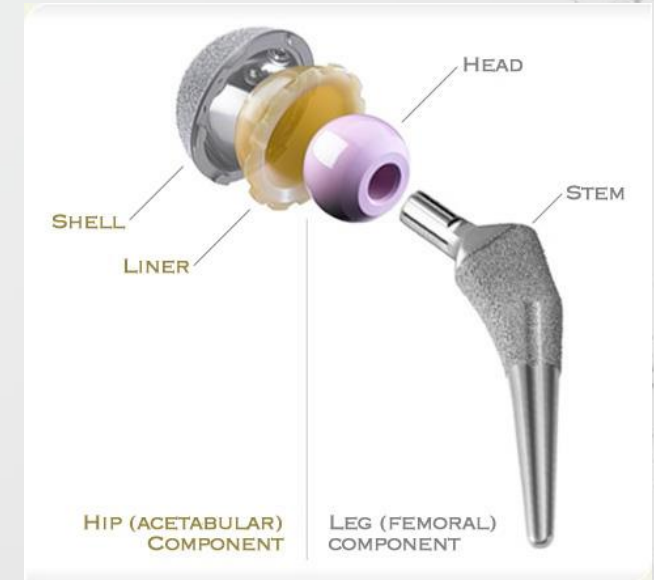
- Crosslinked UHMWPE –  
CREEP, DEFORMATION
- Ceramics –  
BRITTLE, SHREDDING, CONSTANT SQUEAKING
- Metals –  
CORROSION, TOXIC WEAR DEBRIS
- Coatings –  
PEEL OFF WITH TIME (AGING)



**10-15% of the hip and knee operations necessitate costly and complicated revision surgeries within 15-10 years.**

## Unique values of MP-1™ for Hip & Knee implants

- Significant **Longer life-span** advantage (Current < 10-15 Y, MP-1 > 25-30 Y)
- Tough - **higher range of motion** (current- 123°, MP-1 > 160°)
- **Easy production** (direct compression molding)
- Creep resistant – **stable dimension**
- **No Sub-micron wear particles** (Current= inflammation, MP-1 = none)
- Cost effective – **no revision surgeries** (Current= 2 W hospital stay, **MP-1 = 2-3 d hospital stay**)
- Can be implanted in **younger patients** (< 40 Y old)
- Improves life quality and **safety** of patients



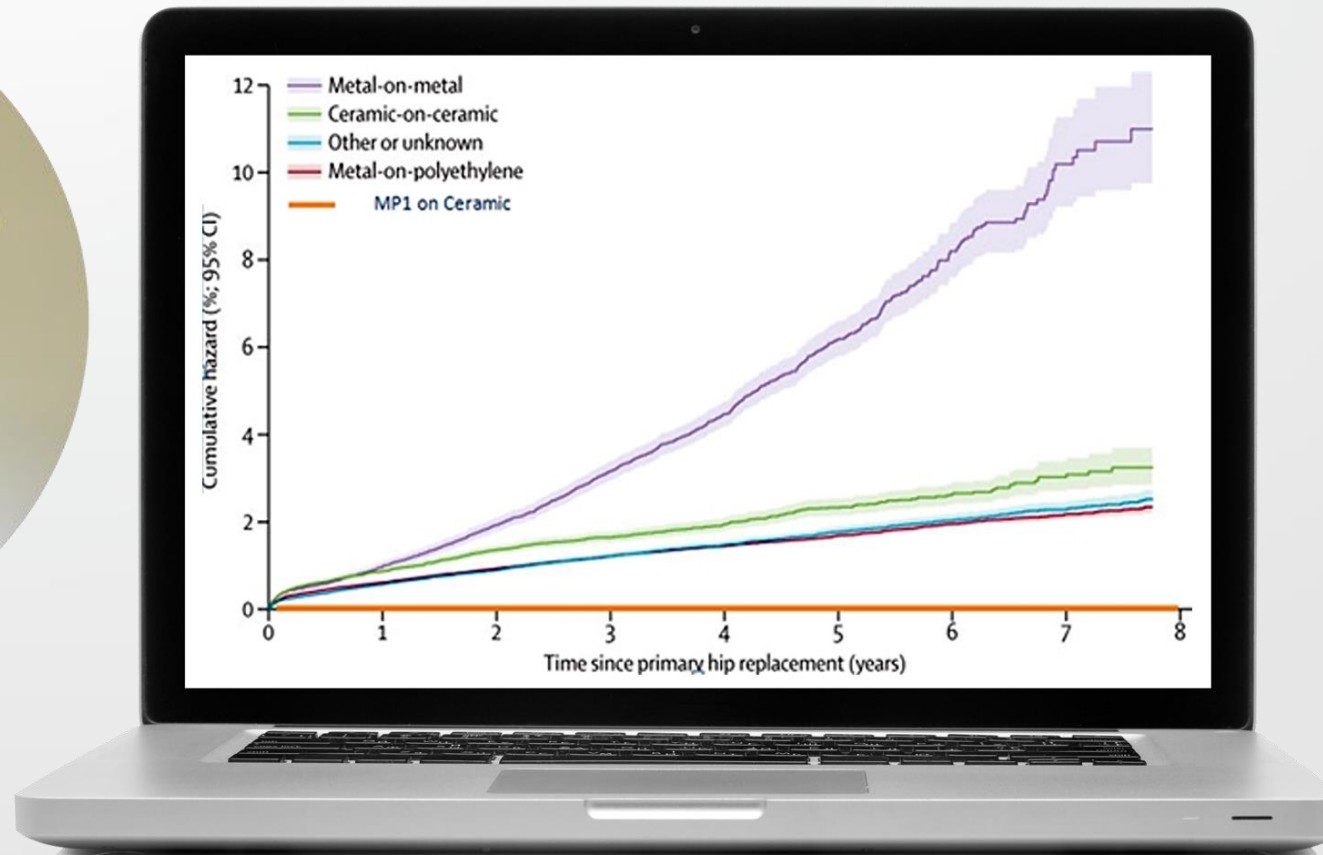


# Hip Acetabular Liner (CE ) - clinical result

**MMA has developed a liner compatible to LIMA design THR system**



**Acetabular liners are  
CE approved**



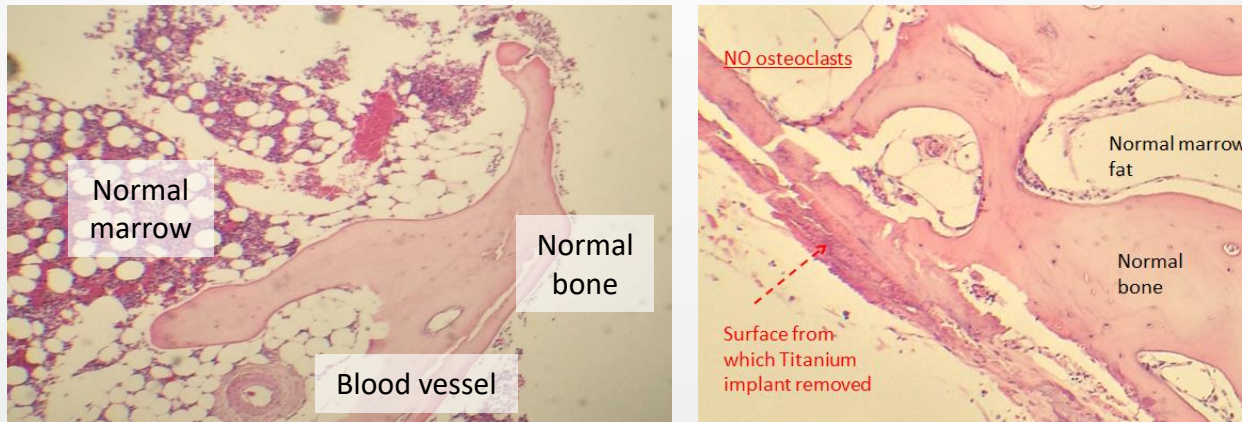
**Clinical results - 01-20**  
Implanted in 115 Patients:  
88 in NZ + 27 in IS

**No Failure up to date  
100% success**

Source : The Lancet : Failure rates of stemmed metal-on-metal hip replacements: analysis of data from the National Joint Registry of England and Wales

# Hip Acetabular liner – clinical results

## The First Patient – 15 Years with implant



ADJACENT BONE X4 POWER

*“The adjacent bone shows minimal remodelling of the cement lines but is essentially normal”.*

P. James Burn FRACS, Orthopaedic Surgeon; Paul Newman FRACPath, Pathologist; Christchurch, NZ

\*Courtesy: Paul Newman FRACPath, NZ

The 2<sup>nd</sup> patient died after 6.5Y from a disease not connected to the implant. He agreed to have histology.

The results showed:

- NO osteolysis
- NO osteoclasts
- NO measurable wear
- The soft tissues around the hip were very bland **without** fibrosis or reactive macrophages

The CT scan of the specimen showed **no osteolysis even through the cup screw holes**

# Post Marketing Clinical Study

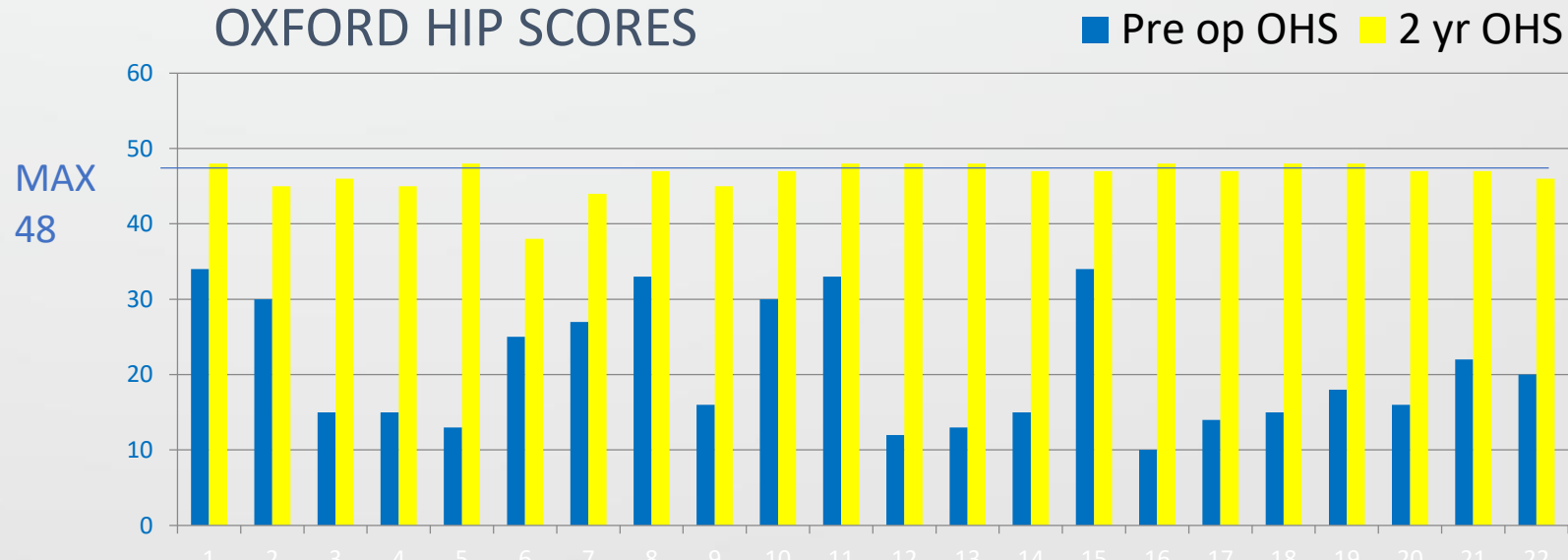
- Ethics committee **URA/11/11/068/AM01**: New Zealand approved Cohort study beginning 2013
- 100 patients
- Patients 40 years and up (**YOUNGER !**)
- No activity restrictions
- Reporting 3 months, 1,2, 5, 10 + years (required 2 Y)
- **2<sup>nd</sup> Center – Rambam Israel, Sep. 2017**
- 15 patients
- **3<sup>rd</sup> Center – HaEmek Afula Israel, Oct. 2018**
- 20 patients
- **4<sup>th</sup> Center – Carmel Haifa Israel, Mar. 2020 (The biggest Hospital)**
- 10 patients



# Successful validation – MP-1™

TRIAL	YEAR	RESULT	LOCATION
BIOCOMPATIBILITY	2003	passed!	Germany
1 <sup>st</sup> Clinical (FIM)	2006 & 2007	+	NZ
2 <sup>rd</sup> Clinical	2013	88 (100) patients	NZ
3 <sup>rd</sup> Clinical	2017 2018	29 (35) Patients	IL

OXFORD HIP SCORES



# MP-ORIF Game Changer for Trauma

## MMA received a grant from the EU under Horizon 2020 SME to develop a trauma implant

The 1<sup>st</sup> device is an  
intramedullary nail

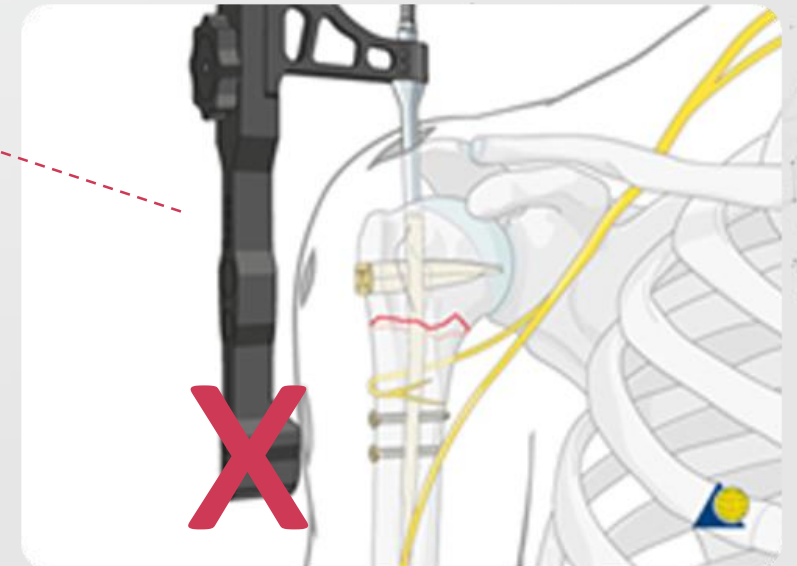


**MP-1™ robust** implant does not need pre-drilled holes. Enabling an easier insertion of screws in various angles allowing for anatomic fracture fixation and optimization of hardware placement, thereby eliminating the requirement of exposure to **X-ray** imaging in the OR

Additional **MP-1™** bone fixation implants:  
**Plates and Screws** (Metal-free implant)



MP-ORIF project



# MP-1™ EXPANSION

## Knee Implants

Tibia, Patella

## Dental implants

Screws, abutments, one-piece

## Cardiovascular

Valves, stents, pacemakers

## Ear Nose & Throat applications

Very small middle ear bones

## Maxillofacial Implants

Plates

## Urology applications

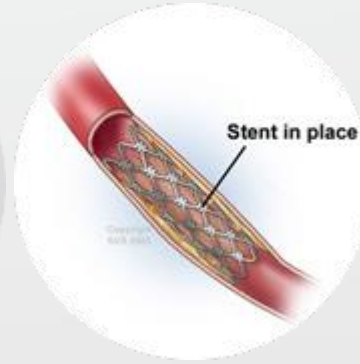
Stents and Barings

## MRI Surgery devices

Non-magnetic surgical knives



## Fixation devices:

Trauma Screws, Nails and Plates. Spacer for spine



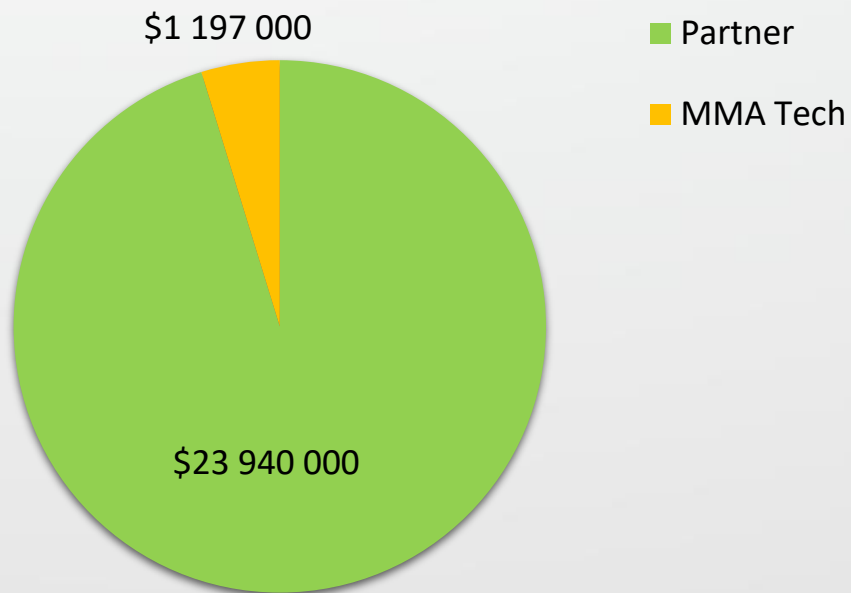
Funded by  
Horizon 2020

# Competitors

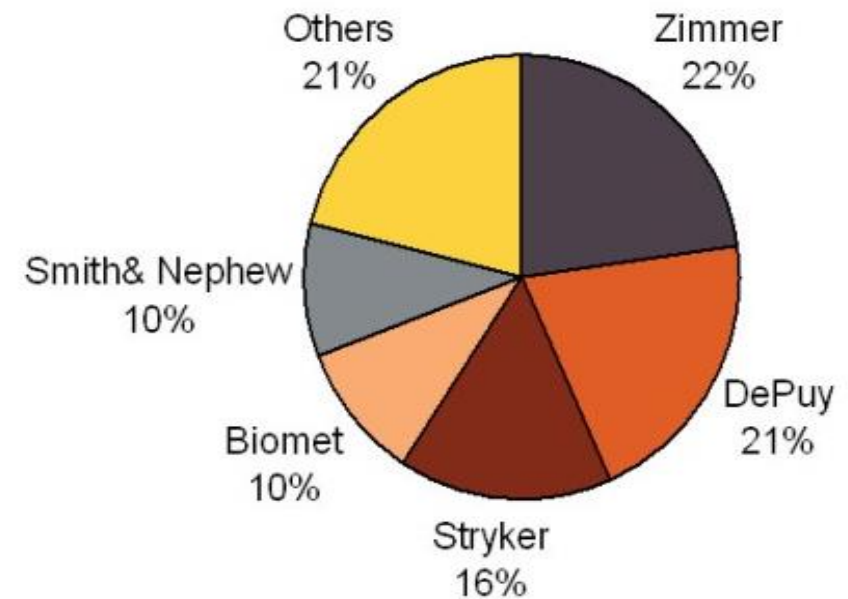
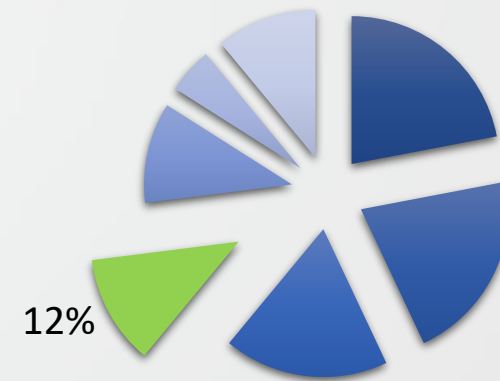
COMPANY	WEBSITE	PRODUCT
	<a href="http://www.ceramtec.com/">http://www.ceramtec.com/</a>	Ceramic implants
	<a href="http://www.microlumen.com/">http://www.microlumen.com/</a>	Polyimide/PTFE stents
	<a href="http://www.itldental.com/">http://www.itldental.com/</a>	Dental implants
	<a href="http://www.arcam.com/">http://www.arcam.com/</a>	Orthopaedic metal implants

# Market Potential– Hip Liner Europe Market

Income after commercialization  
First year Penetration,  
Assuming: **5% penetration** with  
one mid size partner



EU market share





# Market Opportunity

## ■ Orthopedic

- Hip 2019 hip replacement market - \$10B
- Knee 2008 hip replacement market - \$18B
- Spinal 2018 Market- \$7B
- Finger & Toe TBD

compound annual growth rate (CAGR) of **4.9%**

**326,000** THR performed **USA** and **678,000** THR in **G5** (Germany, Italy, Spain, UK and France)

**734,000** TKR procedures **USA** and **460,000** TKR in **G5**

## ■ Dental, Cardio vascular, Urology and ENT TBD

<http://www.cdc.gov/nchs/products/databriefs/db186.html>



**Project budget \$10M**

Source: Millenium Research Group; Datamonitor reports

YEAR	2020	2021	2022	2023	2024
<b>Distribution place</b>	<b>EU ( Germany, UK, Denmark)</b>	<b>EU (11) + USA</b>	<b>EU (15) + USA + BRIC 2 %</b>	<b>EU (full) + USA + BRIC 3 %</b>	<b>EU + USA + BRIC 5 %</b>
Global market place potential ( x 1000)	63	EU 168 + USA 261 = 543	EU 252 + USA 261 + BRIC 71	EU 420 + USA 261 + BRIC 107	EU 420 + USA 261 + BRIC 177
Penetration rate	1%	0,2 %	0,3 %	0,3 %	0,3 %
Units sold	500	1000	1700	3000	5000
Revenue(€) *	772.500	1.770.000	3.009.000	5.310.000	8.850.000

\* Five years financial projection. Revenue is calculated multiplying the number of units sold by the average price per unit of €1000

# Business Strategy & Prospects

## Investment of \$10M

Will be used for (2020-2025):

- **FDA** approval for hip/knee implants
- Scale-up and **mass production** of implants made of MP-1
- Initiate **sales** and marketing
- Analysis of new markets/applications and related R&D activities for **Femoral Head** implant
- **Cooperation** for THR device (DMR)

# Future

M.M.A. Tech is seeking to implement MP1™ as a **gold standard material for medical devices**

Due to its properties, we believe that the **MP1™** can become a **game changer** for orthopedic implants

We are looking for **companies to cooperate** with M.M.A. TECH to introduce the MP1™ to market



Thank you for your time and attention  
For further information

Alisa Buchman CTO

[info@mma-tech.com](mailto:info@mma-tech.com)

+972-525243224

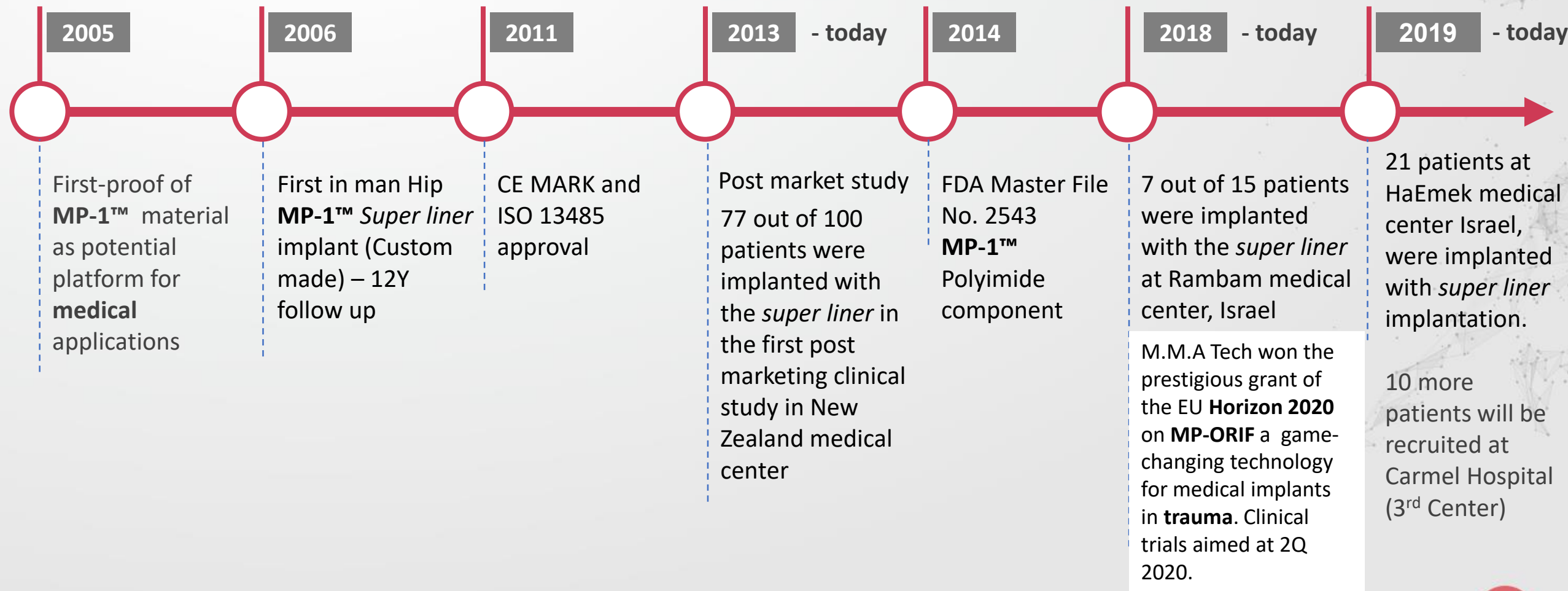
M.M.A. Tech Ltd.

1<sup>st</sup> HaGa'aton Ave.

Nahariya 2201202, ISRAEL



# Landmarks



# Intellectual properties



The company holds the **know-how** for the medical grade raw material production

USP 6,686,437 **patent** covering the medical application

**Trade secret** for production of MP-1

**Additional patents** were submitted in 2017-8 covering specific medical and orthopedic applications  
US-2019-0183545-A1 patent was published in 2019 covering **trauma** medical and orthopedic designs