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3D Printed Microwave Hyperthermia Applicator

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MULTIDISCIPLINARY



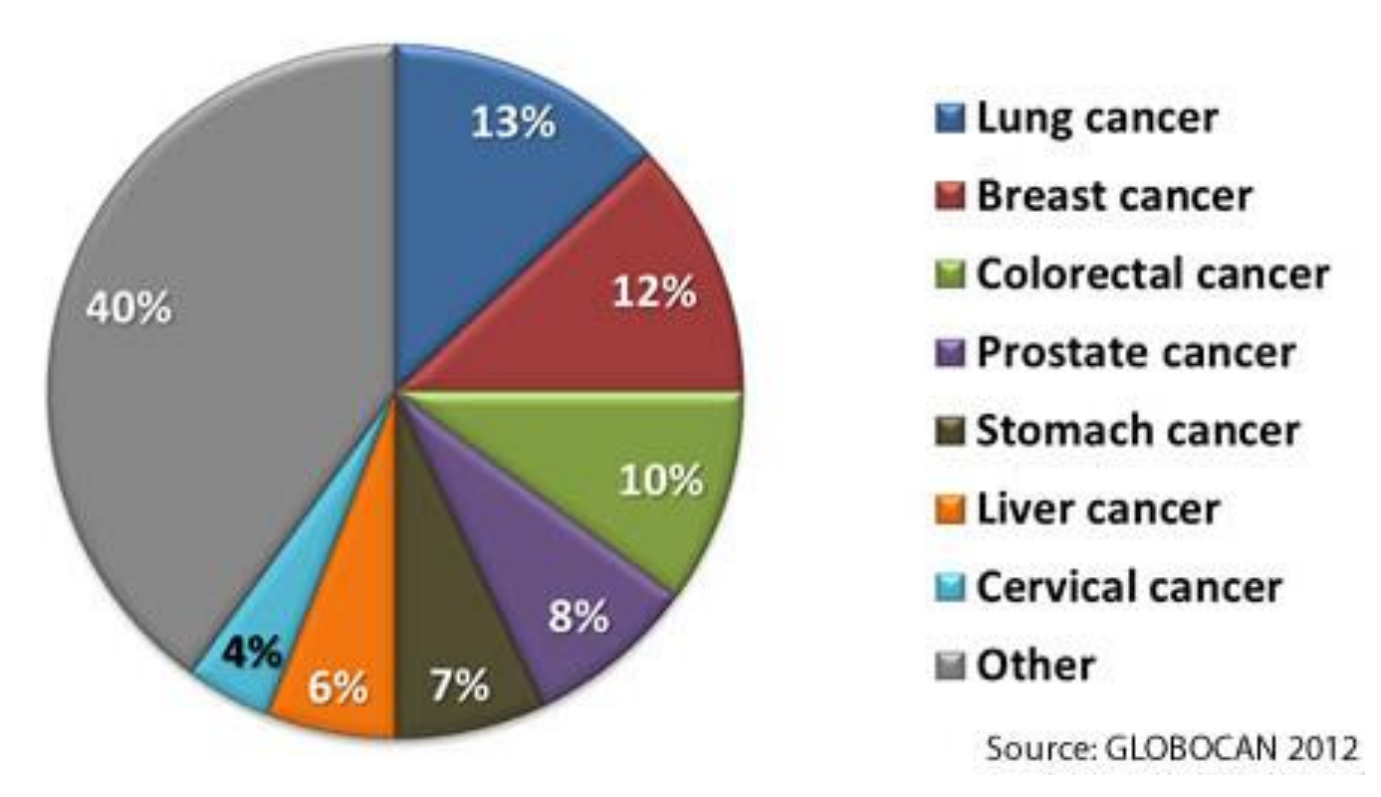
3D Printed Microwave Hyperthermia Applicator

CAPSTONE DESIGN
EXPO 2016

The Problem

According to the CDC, every year approximately two million people were diagnosed with some type of cancer in the United States alone.

Most Common Cancers Worldwide in 2012

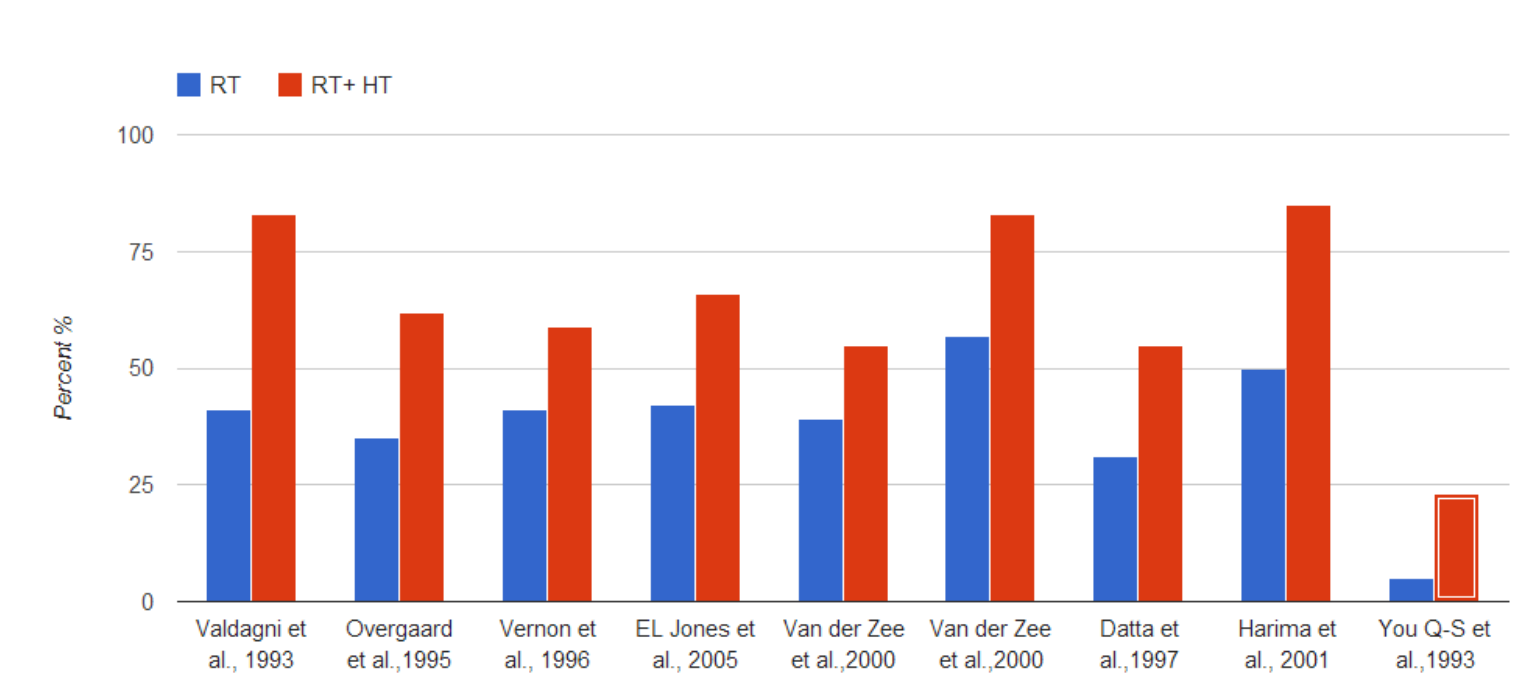
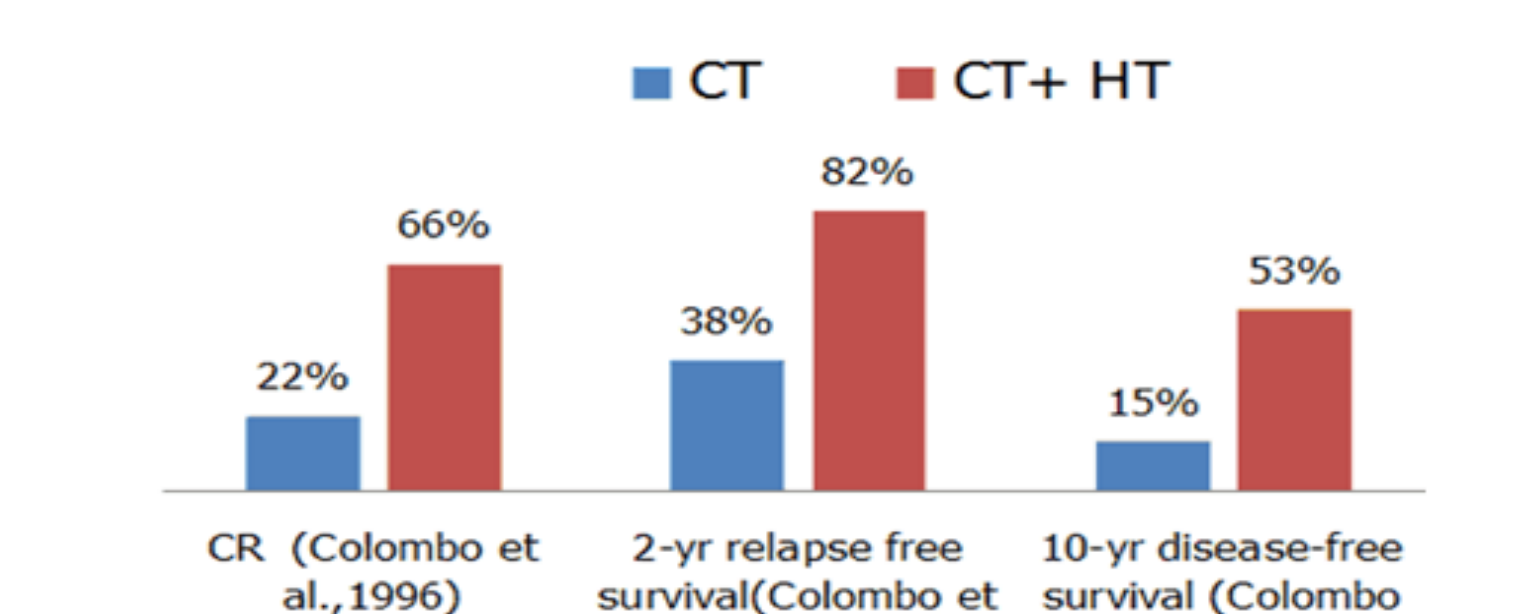


Common Cancer Treatments

- Surgery
- Chemotherapy
- Radiation Therapy
- Targeted Therapy
- Immunotherapy

Other Procedures & Techniques

- Stem Cell Therapy
- Hyperthermia
- Photodynamic Therapy
- Blood Product Donation & Transfusion
- Lasers in Cancer Treatment



Expensive

Bulky

Complex System

Current Hyperthermia Applicators

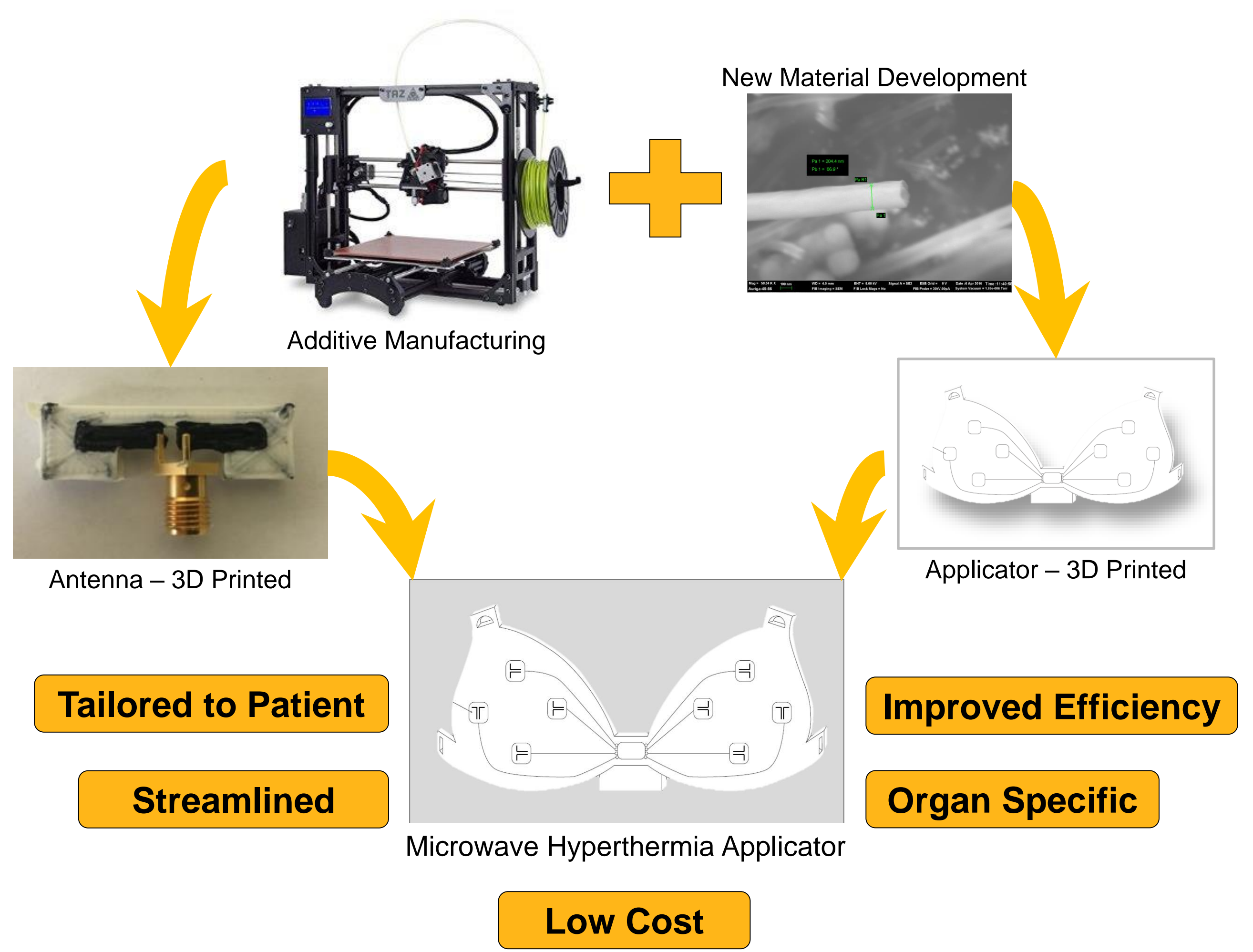
Heats Entire Body

Low-Efficiency

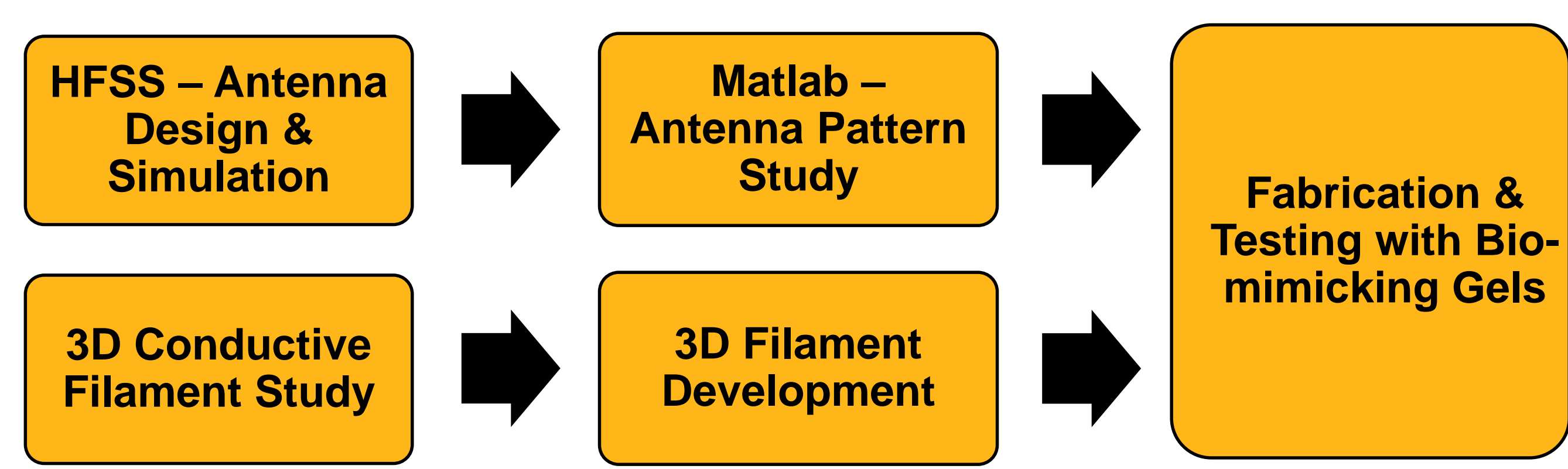
Non-Conformal

Goal

Develop a cost-effective, efficient hyperthermia applicator that can be tailored to specific patient needs and can offer targeted cancer treatment.

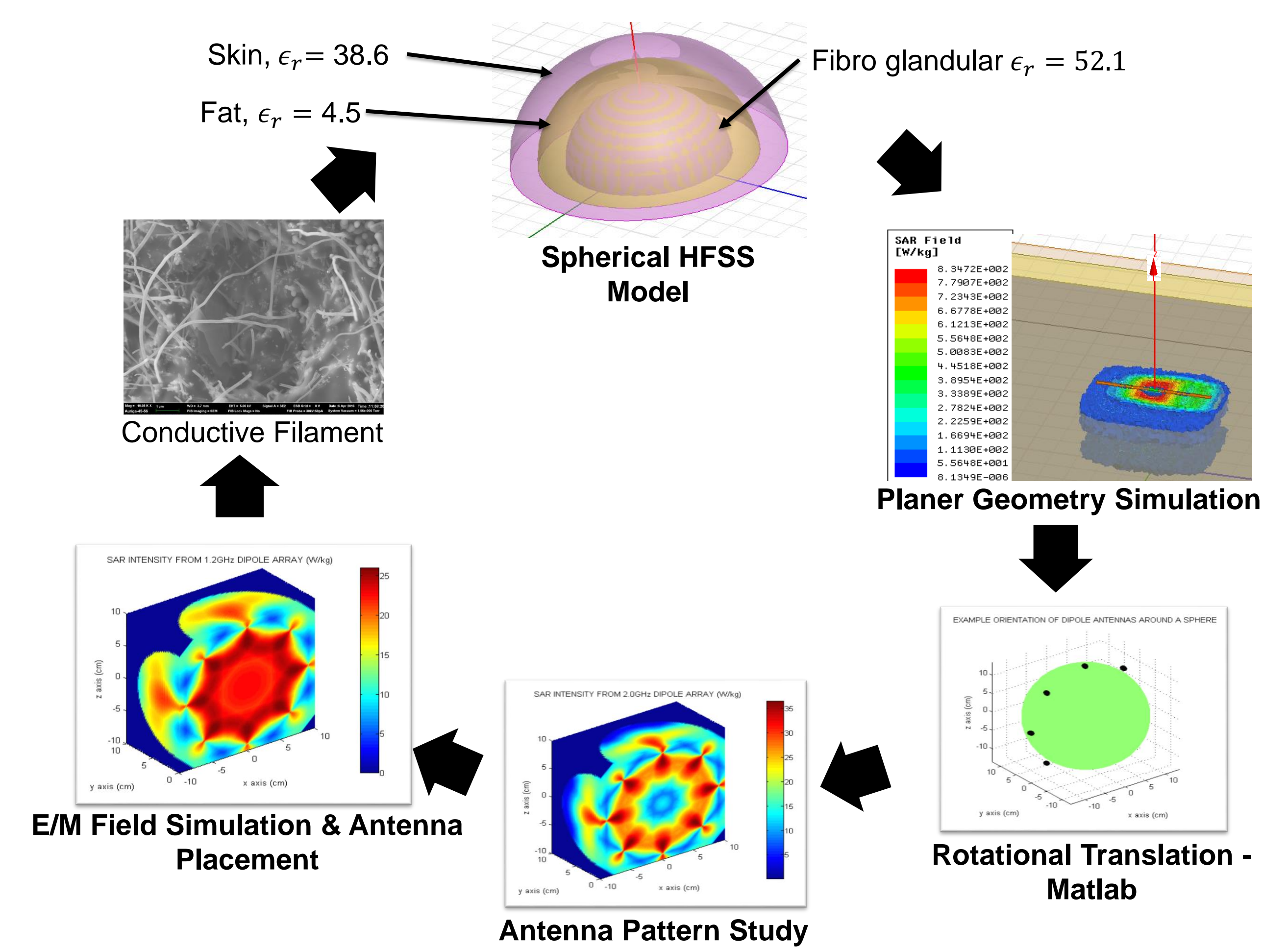


Approach & Innovation



Research & Design

Bio-mimicking gels were developed and characterized using a Keysight network analyzer. Microwave antenna response of the breast tissues was characterized.



Conclusion - The Product

Development of a cost-effective Product for including Microwave Hyperthermia as part of regular Breast Cancer diagnostics and care.

Development of a microwave hyperthermia protocol that can be modified for various types of cancers

