2016

3D Printed Microwave Hyperthermia Applicator

Umar Hasni  
*Virginia Commonwealth University*

Christopher Deloglos  
*Virginia Commonwealth University*

Patricia Moseh  
*Virginia Commonwealth University*

Follow this and additional works at: [https://scholarscompass.vcu.edu/capstone](https://scholarscompass.vcu.edu/capstone)

Part of the [Engineering Commons](https://scholarscompass.vcu.edu/capstone)

© The Author(s)

Downloaded from  
[https://scholarscompass.vcu.edu/capstone/68](https://scholarscompass.vcu.edu/capstone/68)

This Poster is brought to you for free and open access by the College of Engineering at VCU Scholars Compass. It has been accepted for inclusion in Capstone Design Expo Posters by an authorized administrator of VCU Scholars Compass. For more information, please contact [libcompass@vcu.edu](mailto:libcompass@vcu.edu).
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

Goal

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

Research & Design

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

Approach & Innovation

HFSS – Antenna Design & Simulation

Matlab – Antenna Pattern Study

Fabrication & Testing with Bio-mimicking Gels

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