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Current updates on photoacoustic-based techniques for Breast Cancer Diagnosis

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Introduction

- GLOBOCAN 2020 statistics considered Breast cancer as the most diagnosed cancer
- Early detection = Better Prognosis
- Current techniques has limitations such as low resolution, high false positive rates and risk of exposure to ionizing radiation

Aim

To conduct a systematic review on the recent advancements in photoacoustic technique for detection and diagnosis of the breast cancer

Advancements

Microscopy

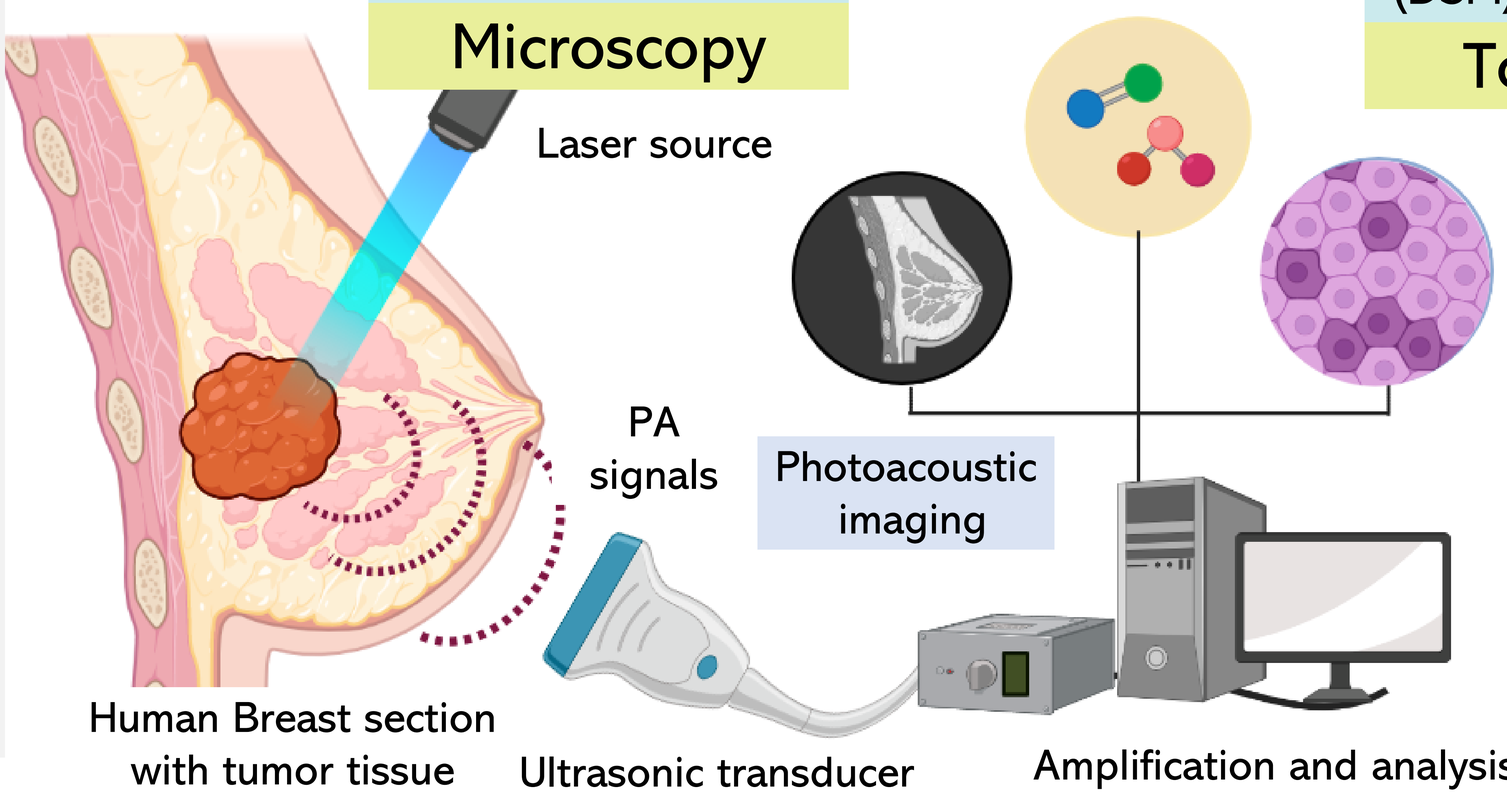
- Optical-resolution photoacoustic microscopy (OR-PAM)
- Acoustic-resolution photoacoustic microscopy (AR-PAM)
- UV- photoacoustic microscopy (UV-PAM)

Spectroscopy

- Effectively differentiate the malignant from normal breast cancer
- Aid in monitoring breast cancer progression

Tomography

- Single-breath-hold photoacoustic computed tomography (SBH-PACT)
- Multispectral optoacoustic tomography (MSOT)
- Photoacoustic mammography (PAMMG)
- Twente Photoacoustic Mammoscope (PAM)
- Dual Scan Mammoscope (DSM)



Methodology

Article were retrieved from databases such as Google scholar and PubMed published between 2015-2022

Conclusions

The personalized recommendation of these techniques based on the convenience, nature of the tumor, and other factors will increase the accuracy of tumor detection

Merits

- Ease of detection
- Better resolution
- Mostly Noninvasive

Challenges

- Few clinical data
- Lack of standardization
- Lack of uniformity in naming system

Photoacoustic Techniques

References

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