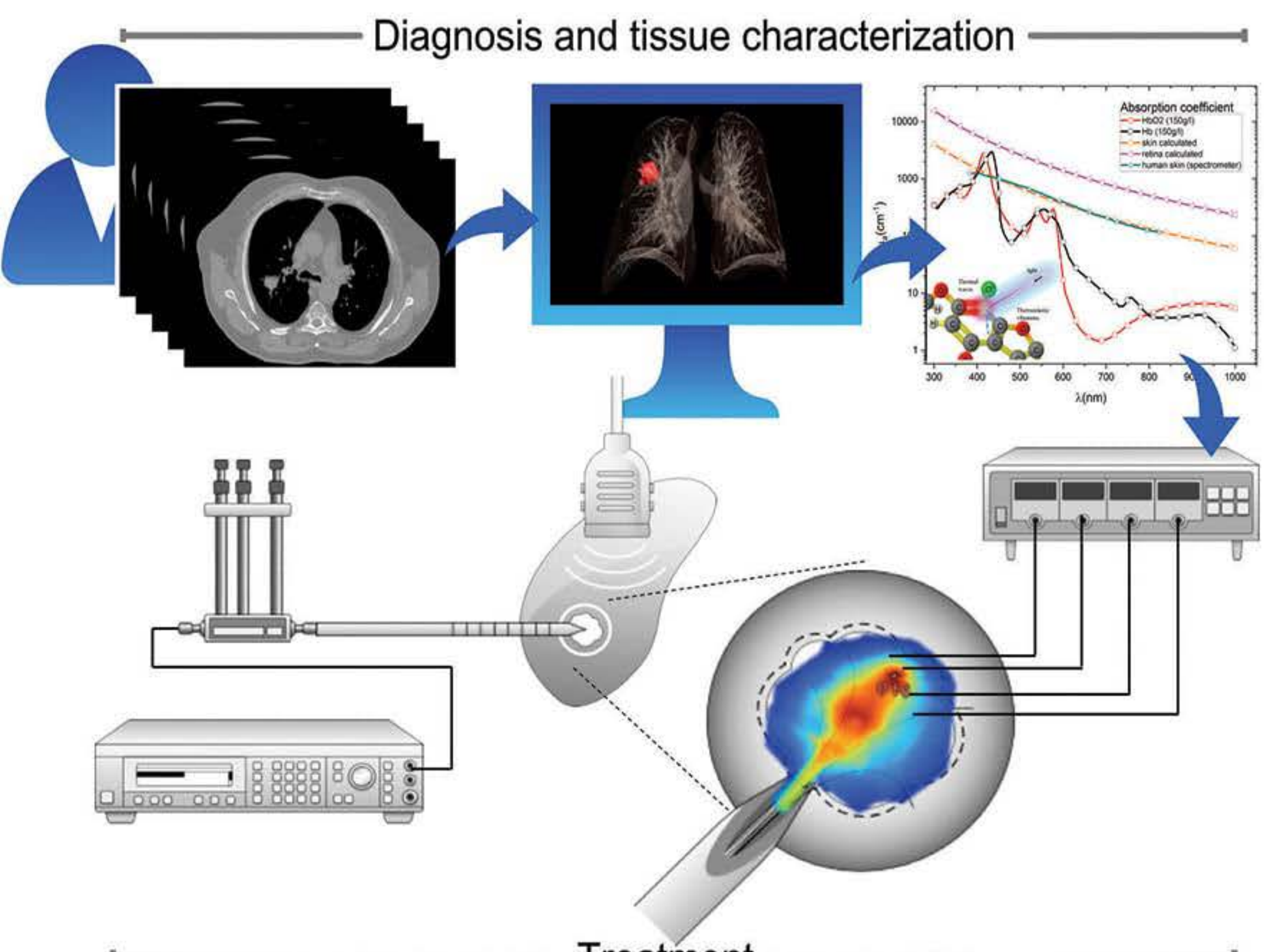
DIAGNOSIS AND TREATMENT OF CANCER USING THERMAL THERAPIES

MINIMAL AND NON-INVASIVE TECHNIQUES

Citlalli J. Trujillo-Romero *and* **Dora-Luz Flores** (*eds.*)



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Chapter 13

Magneto Hyperthermia

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This chapter deals with magneto hyperthermia from a perspective that allows an understanding of the fundamentals associated with nanoparticles. First, it covers some clinical bases on the effect of hyperthermia on cancer cells. Next, it describes the mechanisms associated with the temperature increase in nanoparticle systems that causes the increase in temperature. Thirdly, some factors affecting the design of the formulations are described with emphasis on the properties of the nanoparticles. Among these factors, the chemical composition, the synthesis method, and the surface modification that has driven scientific research in recent years for the design of magneto-hyperthermia treatments stand out. Finally, a reflection on the scope of nanomedicine systems developed for magneto hyperthermia therapy in the context of clinical studies and leaving open the question of whether we are close to seeing this treatment as a daily clinical practice against cancer.

13.1 Introduction

Hyperthermia is an alternative thermal treatment used against cancer, which consists of raising the temperature in the tumor region to cause damage to the tumor or destroy it. A new method to achieve this treatment is by applying an alternating magnetic field to a suspension of magnetic particles in a fluid. The problem with this treatment is controlling the generation of heat so that it only