Process Development for Thermographic Breast Cancer Diagnostics

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Do healthy and cancer cells differ in temperature? Can this be explained by different metabolisms? These questions arose during the search for a non-invasive diagnostic method for breast cancer. The project aims to provide complementary early diagnostics. Breast cancer is still the most common cancer among women. In addition to 70,000 breast carcinomas diagnosed each year, 17,000 women die from this disease. A good early diagnosis can considerably reduce this mortality rate. Since some of the current diagnostic methods cannot be perceived by pregnant and high-risk patients, this was motivation enough to find a complementary method. The theoretical basis was the Warburg effect with the description of different metabolites in healthy and cancer cells. This led to the hypothesis that cells differ in temperature. After evaluating the method with pork, the measurement was applied to patients with and without cancer. This was done as a clinical study. Afterwards a double-blind evaluation was carried out, which was compared with the existing doctor's diagnosis after establishing the suspicious diagnosis. This led to the evaluation of the correctness and accuracy of the thermography as a diagnostic procedure. The measurements showed a colder temperature than the surrounding tissue. This was correctly recognized in suspected diagnoses and a discussion on error minimization was elaborated. It can be stated: breast cancer is detectable by thermography and it could be included in early diagnosis as a favourable complementary and non-invasive method