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Beneficial effect of sequential chemotherapy treatments of lung cancer patients revealed by calorimetric monitoring of blood plasma proteome denaturation

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Highlights

- Heat capacity profiles of blood plasma from lung cancer patients differ from those of healthy controls
- Chemotherapy shifts the parameters of blood plasma thermograms of lung cancer patients towards the "healthy" values
- DSC is a potent non-invasive tool for monitoring malignancies

ABSTRACT

Blood plasma heat capacity profiles of lung cancer patients were recorded by DSC and monitored during a first-line chemotherapy cycle including four sessions of treatment by a platinum-based doublet of cisplatin or carboplatin in combination with a third-generation agent (paclitaxel, gemcitabine, or docetaxel). The heat capacity profiles were deconvoluted into the major blood proteome constituent peaks, and the thermodynamic parameters of the peaks – temperature, relative area, and relative maximum heat capacity – were determined. The deconvolution procedure allowed identification of characteristic differences from the control profiles of healthy volunteers. As a result of the chemotherapy sessions, the parameters of the thermograms of the patients shifted towards the "healthy" signature profile, thus providing a