

Toward Cancer Treatment Using Terahertz Radiation: Demethylation of Cancer DNA

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Abstract—Carcinogenesis involves DNA methylation which is a primary alteration in DNA in the development of cancer occurring before genetic mutation. Because the abnormal DNA methylation is found in most of cancer cells, the detection and manipulation of DNA methylation using terahertz radiation can be a novel pioneering method in cancer study. The DNA methylation has been directly observed by terahertz spectroscopy at around 1.65 THz and this epigenetic chemical change could be manipulated to the state of demethylation using a high-power terahertz radiation. Demethylation of cancer DNA is a key problem in epigenetic cancer therapy and our results may lead to the treatment of cancer in early stage.