

# Application of Microwaves in Medical Sciences



## Opn Calla\*

Director, International Centre for Radio Science, India

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\*Corresponding author: Opn Calla, Director, International Centre for Radio Science, Plot. No.1, Rano ji ka Baag, Khokhariya Bera, Nayapura Mandore Jodhpur-342304, India

## Opinion

The microwave Spectrum is part of total Radio Spectrum that excludes smaller wavelength like optical, infrared and thermal infrared. The Radio window spreads from the length of one meter wavelength to ONE cm wavelength that is 300MHZ frequency to 30GHZ. This part of frequency spectrum has applications in medical sciences and these are being discussed in the following two page note, the basic reason for this application is the fundamental property of Microwaves that is the energy levels are higher in microwave frequencies and the electrical properties of the material also are related to the microwave frequencies. The most important electrical property of the material is the dielectric constant that is the permittivity of the relationship to the frequency and hence we are able to characterize the material and study the behaviour of the material at microwave frequencies. This property of Microwave frequency that has relation to the electrical property of the material varies with the inherent material's electrical property which changes due to the physical properties of the material.

The anomaly in the natural radiation emitted from the Target and received by the microwave instrument helps in detecting and delineating that part of the target which has different signatures. Thus using this technique one can detect the cancerous tumours in the body. This Radiometer technique has been very successful in detecting breast cancer. This radiometer technique is also used for detecting deep rooted tumours in Brain and other parts of the body. As discussed the microwave radiometer as a receiver will detect the radiation that is emitted from the body at Normal Room Temperature. The part of the body which has a tumour will radiate Microwave Energy that will be different in Intensity as compared to the other parts of the body that does not have a tumour. This tumour could be deep in the body and for such deep located tumours the lowest frequency possible in MHZ will help in detecting tumours. It is very interesting to note that the Microwave frequency instrument can also be used for healing the cancerous and other tumours.

The tumours that are deep in the body survive because of the Blood circulation through the tumour and if by some means this Blood circulation is stopped to the tumour then the tumour will

not survive. One of the methods of stopping Blood circulation to the tumour is by heating the tumour to a certain temperature. The heating of the tumour has to be focussed and it should not heat other parts of the Body. For this focussed Heating Microwave Heating is the best method as this will not Heat other parts of the Body and it will have direct effect on the Blood circulation of the tumour and once the Blood circulation is stopped to the tumour the Growth will also stop and the tumour will start shrinking. The heating that takes place is dielectric heating of the blood and that will reduce the blood supply to the tumour. The most important aspect in this type of Heating is that it has to be focussed otherwise if it is de focussed or spread out it will have adverse effect on the Surrounding area and generate other problems in the areas which are outside tumour.

These tumours could be cured by using the Microwaves; here we heat that part of the body where the suspected tumour in the body is deep rooted. The Microwave Heating is FOCUSED and only that part of the Body is heated where the tumour is detected. The Microwave Heating is the dielectric heating and the blood in Liquid form is heated and this blood evaporates that reduces the Size of tumour. Thus the tumour shrinks due to lack of supply of blood. By this method of Microwave Heating the size of the tumour is reduced and thus cures the tumour. Thus Microwaves as energy can be used for detection of cancerous tumours and later after detection of malignant tumours we can use Microwave Energy for curing the cancer by focussed Heating of that part of malignant tumour. In this NOTE the Application of Microwave in the Medical Sciences is given. The detection of Cancerous tumours is possible as indicated using the self emission of Microwave from the Body.

In this note the method of curing the cancerous tumour is also indicated. For curing Cancerous tumour the method of Microwave Heating is utilised. The method of Dielectric Heating is utilised and because of this method of Focussed Heating only the portion where the Cancerous tumour is located and only the tumour is Heated and the growth of Cancerous tumour is stopped. In this brief note both the properties of Microwave Radiation have been

given that includes. One capability that is the Microwave detection of tumour and the other Capability is that of curing the cancer by the method of Focussed Microwave Heating. At ICRS Experiments were Conducted Where the Vegetables like pottato and Tommatto were used. It was observed that by using the Microwave Heating the weight of These Vegetables got reduced. In case of pottato it got reduced from 66grams to 6 grams and its volume also reduced. In case of Tomatto the original weight that was 76gram it got reduced to 3gram.

The size also reduced. This experiment proves that by Microwave Heating the size and weight of the Vegetables get reduced. On similar lines when tumour will get focussed microwave Radiation it will also shrink in size and its weight will also reduce.

Thus one can use focussed Microwave Heating for shrinking the Cancerous tumours and curing the cancer using Microwaves. The change in electrical property is detected by Microwave Instrument; this instrument could be either a passive Microwave Instrument (Radiometer) or a Active Microwave Instrument (Radar). The Passive Microwave Instrument –Radiometer receives the emitted radiation from the target and the emitted radiation provides the signature of the target material. In this short NOTE it has been brought out that Microwave can be used for detecting tumours (both Normal and Cancerous) and also curing the cancerous tumours by focussed Microwave Heating by shrinking the tumours that happens because of stopping of blood supply to the tumour.



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