Good afternoon. It's a distinct pleasure to be here today. Thank you Dr. Anuradha and Pratik for giving an opportunity to present ourselves for the dynamic biomarkers that would have actually immense role in minimal residual disease. I think this is an era of precision oncology and we can debate, discuss the role of dual biomarkers like circulating tumor cells and CTDNE in variety of the progression of disease longitudinally. I would like to speak few lines about past circulating tumor cells, what it has done, how it was approved, what are the most important prognostication outcome. And I would also like to see the power of this dual biomarkers, what they can do. Instead of talking about MRD, I would like to talk about the minimal cellular disease because all of us know that 90% of patients, they carry metastatic signatures and PET scan or CT PET scan cannot detect it. So our assumption of a disease free is on the basis of actually the limit of detection by the imaging systems. And we know that in breast cancer and colorectal cancers, this kind of a biomarkers are actually proving important role in order to enhance the overall survival. And I would like to present our on co-monitor test data in lung cancer on 265 patients and if time permits and if Dr. Anuradha permits, I will actually go ahead. So innovators, I mean treating cancer is the highest ability of an oncologist and nobody better than you understand how to deal with the oncologist. The patient, while we do do that, we want to also actually found companies innovate and be as an you know kind of a global village in terms of in Gandhian engineering. You know the term that brought as in Swadeshi, I would like to actually mention that what Gandhian philosophy of engineering is even in designing materials which can be capable of recognizing such very low abdent cancer cells which are hiding into billion of other cells. And that has been done by you know western country, keeping the capacity to you know detect these kind of a cells. If you look the labs that actually work like one cell or bacterias, they are all dependent upon actually importing components. And I am sure that the whole end in the position that we will talk about affordability, and availability without innovating in this country. So I dare to say that we have been here for 11 years, we have been publishing the main domains to actually innovate, file patents, not for you know as an incremental innovation but to be an leader. I am going to talk about one of an small innovation that what we have done, but it is small in terms of actually what we do, but it is going to be a very very phenomenal and incremental not by an hypothesis but by some of the data that I would represent. I think cancer is a critical problem everybody knows it. That

MDR especially if you consider five years open you know relax that what we see in spite of a surgery or a resection or you know taking care of a margins. So why do patients come in the clinic in spite of actually the surgery has been perfect, the chemotherapy has been great, your RTE has been you know very very responsive. Prime and prudent reason of actually patient coming back in recurrence from remission is circulating to myself because these are live fugitive cells that are actually running around. Only we did not have capability to recognize their role whether they are in different transitions or not. I think cancer dormancy especially in the breast cancer we know that the patient can remain in remission for decades and they would come back with the metastasis. MDR is a new toy in the town and all of us know that you know in early stage detections to late stage detections the role of packaging therapy especially in de-escalation is very very important as per as an India is concerned and you know if you look at a graph for detecting this kind of biomarkers is at the epitome at the high level. When we take care of a patient most of the biomarkers including our protein biomarkers they go down but why do they actually they come back and I think Dr. Prashanth will agree here that circulating tumor cells probably is the only cause. So all of us know this population knows actually the difference in circulating tumor cells and DNA DNA has been used very widely very routinely in in knowing actually what is the last line of a treatment in metastatic cancers like one cell has 1000 AT genes panel but circulating tumor cells probably is not used for treatment decision except in few few components like colorectal cancer and breast cancer and I think today's objective is actually talk about lung cancer. So what has been the past of circulating tumor cells 2004 imagine an innovators probably they were working on this kind of and components designing materials to capture circulating tumor cells and USFD approved this in 2004 for probability of overall survival percentage detection as you see on the y-axis and in metastatic conditions I think the dismal overall survival is absolutely known as unprognostic cancer, colorectal cancer and prostate cancer. Later on what happened the importance of CTC went down because we wanted to evaluate this role in early cancers not only prognostication in metastatic cancer and I'm very proud and humbled to say that today we have done 8000 cancer patients in early stage detection in India here and we are providing data to the world actually not in the metastatic but in other regimens. If you look I I love this actually coherence review there are three possibilities that the patients whether you detect them early or treat

them well they
are going to actually get into the primary resistance and that that's a holy grail of actually oncology.
The patients actually they respond well and they they could recurrant and the best scenario is
actually the remission you can be detecting by this DNA this is a wonderful review.
The challenge as I mentioned is to find one culprit among billions of a cell if I'm a chemical
engineer I can tell you that philosophy of Gandhian engineering is very simple. Do great
with minimal components for for many people and if you look on the components here there are
many many components and how do you design this kind of an antibodies and materials which can
specifically capture epithelial is is is an wonder of actually this kind of an engineering.
We are the first Indian company which got a medical device approved by DCJ and CDSO
after several years of actually clinical trials in Tata Memorial Hospital with Dr.
Pankarj and Dr. Kumar. The importance of safety from cyto-carotene was known but the ability to detect
actually other protein markers like PDL1, H2 and so many markers can be done in our
Pune lab today in four and half years of a time. To set the context I think these three components
are important on the right hand side the decimal outcome with if both the bio markers are actually
present. This has been shown in breast cancer this has been shown in colorectal cancer and this
can be shown in the lung cancer but unfortunately philosophy clearly lung actually does not allow
CTC to disseminate as good as actually other cancers and I think most important innovation that
I am talking about will will if we compare actually CT DNA from the tissue or the blood
and from circulating tumor cells through the technology that we just launched at ES will be
a month back captures and releases the cell and we are done now 1,200 patients CTC,
live CTC, 2C and the whole genome amplification and this data is phenomenal and
discordance to that of a CT DNA. I dare to say it first time today that the dependency on tissue
and blood gives 40% probability of a patient to actually have an overall survival. The data
coming from those disseminated cell from circulating tumor cells is not in concordance with this
because of a pooling of and data and I will say actually and pause in few few minutes.
If you look when we had a paid sample from CT DNA from the same patient about 20 to 25%
times you cannot detect mutations because of a sensitivity limit today and that will continue
for another decade or so unless engineers do something great. So they cannot avail actually
your modern companion diagnostic treatments even if they are expensive especially in the western
world. What we found in this patient we get circulating tumor cells and if you look on the
right hand side broad rotational profile probably is very concordant and in a pancreatic study that
what we are doing in a medical school Wisconsin and Stanford at HCC we find a very very differential

information. Now interesting is that in clinical trials especially in the conducting new patients
is very very challenging, delayed and very expensive. So protein markers like PDL1 or H2N
these live cells can be very important for the patients and I think I will go back to one of
longitudinal monitoring of our own patients from your clinics into 165.
This is called as a J&A quadrant. This is like Jacob all quadrant or Jayanth or Aribithan quadrant.
What we find that patients who had actually both this biomarker present were about 50%
in lung cancer. On the right hand side quadrant too almost like 25% patient had either of the
biomarkers if CTDN is negative great I think you do not have a localized tumor but if CT C is
positive I think there is a chance of recurrence. If you look at a third quadrant where CTDN is
positive that means there is actually a residual disease and CT C negative that means the patient
do not have a disease in the circulation. So monitoring these patients is very important and
the last summary is that if patient do not have a CTDN as well as negative I think that's a best
exceptional responders. Thank you very much.