



# Dr. Richard Tuli: advances in radiotherapy and radiotherapy/drug combinations for pancreatic cancer

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## Expert introduction

Dr. Richard Tuli (*Figure 1*) is a radiation oncology specialist, Associate Professor and Clinical Director at the Cedars-Sinai Medical Center in Los Angeles, California. He graduated with honors from Jefferson Medical College Of Thomas Jefferson University and the Johns Hopkins Hospital. Having more than 11 years of diverse experiences, especially in radiation oncology, Dr. Richard Tuli affiliates with Cedars-Sinai Medical Center, and cooperates with other doctors and specialists in many medical groups including Cedars-Sinai Medical Center. His research interests include investigating novel radiotherapy techniques to improve outcomes and minimize toxicity, and identifying radio-sensitizing agents for treating cancer.

Current research is directed toward poly ADP-ribose polymerase (PARP) inhibitors, immunotherapies and other novel drugs in combination with radiation. His awards include the ASCO Cancer Foundation Merit Award, AACR Scholar-in-Training Award and Hyman Menduke Research Prize. In addition to presenting his research at numerous national and international conferences, Dr. Tuli serves as a manuscript reviewer for peer-reviewed journals. He is one of the guest editors of *Annals of Pancreatic Cancer*.

## Editor's note

As an experts own solid academic background, Dr. Richard Tuli who Having more than 11 years of experiences in radiation oncology has delivered an informative and enlightening speech entitled "Advances in radiotherapy and radiotherapy/drug combinations for Pancreatic and GI malignancies" at the 8th Annual International Surgery Forum, which held from November 17–18 in Shanghai, China. After his presentation, we were honored to invite Dr. Tuli to have an interview and share his perspectives on the latest advances in radiotherapy techniques for pancreatic cancer.

## Interview

**APC:** *Could you please share some latest advances in radiotherapy or radiotherapy techniques for pancreatic cancer?*

**Prof. Tuli:** The role of radiotherapy in the treatment of pancreatic cancer is not entirely clear. Some data suggests it is beneficial, however, other data suggests perhaps it is not helpful. So a lot of effort is being put into improving techniques that allow radiation dose escalation while protecting the normal surrounding tissues such as bowel, liver and kidneys. This way we can potentially increase effectiveness while keep the treatment tolerable without too many side effects. These techniques include intensity modulated radiation, volumetric arc radiation and proton therapy among others. A lot of research is being done on identifying and managing respiratory and organ motion so that radiation can be delivered more accurately, especially for pancreatic tumors.

We are also looking at ways of augmenting the affect of radiation by incorporating drugs that sensitize tumors to the treatment, such as PARP inhibitors. We are also incorporating other treatments such as immunotherapies which is a novel treatment.

**APC:** *Would you like to share with us why you are interested in radiation oncology, a field even not well understood by some surgeons?*

**Prof. Tuli:** So I come to China to convince the surgeons that radiation is helpful and beneficial. I fully understand that for some surgeons there's a concern that the radiation will make the surgery more challenging and more difficult. Nevertheless, our technology has advanced substantially in the past couple of decades and we can carefully focus the radiation and make it go where we want it to go. In pancreatic cancer, removing all the tumor is sometimes a challenge, especially the tumor near the blood vessels. We can now focus higher doses of radiation to these areas to make it easier for the surgeon to remove the tumor completely. Therefore,



**Figure 1** Dr. Richard Tuli, Associate Professor and Clinical Director at the Cedars-Sinai Medical Center.

I think as long as the radiotherapy is delivered correctly and properly, it can not only help surgeons achieve the planned outcome, but also benefit the patients. The reason that I focus on radiation oncology is because in United States, it is an exciting field and a dynamic specialty including the knowledge of physics, medical physics and clinical oncology.

**APC:** *Your current research is directed toward PARP inhibitors, immunotherapies and other novel drugs in combination with radiation. Could you share what you achieved in the field?*

**Prof. Tuli:** My research is built on the backs of many intelligent people who I trained with at Johns Hopkins and other institutions. We started to look at PARP inhibitors because we learned that pancreatic cancer like all the other cancers that not every the tumor is the same. Thus a lot of researches have been investigated into how the tumors are different. One distinguishing difference we learnt is that some of the tumors have a deficiency and ability to repair the DNA. This is what called the developed cancer but we can explore the sensitivity where the drugs that damaged the DNA.

So we preferentially damage the DNA of the tumors than we might be able to kill more tumors than the otherwise would be able to. The PARP inhibitors facilitate the idea that if a drug can prevent the damaged DNA from repairing itself, and then when we add on other DNA damaging agent like radiation and chemotherapy, we can increase the sensitivity of the tumors to these treatments. We have seen it in the treatment of various cancers such as breast cancer and prostate cancer. We are aware that there is something we can explore in pancreatic cancer. We hope that we were able to identify a proportion of patients who have

some deficiency in DNA damage repair in the beginning, then they received PARP inhibitors with chemotherapy or radiation or both and they could have a better response.

**APC:** *What are implications for radiotherapy for pancreatic cancer the next century in you view?*

**Prof. Tuli:** I'm a radiation oncologist. Although the surgeons will mad at me, I hope that we could replace surgery with radiotherapy because it is a non-invasive treatment. I tell my patients that the hardest part of radiation is that you have to come everyday for one week or six weeks. That is the hardest and most challenging part of receiving this treatment. But it is non-invasive, and there's no cutting, no needles and the patients don't have to under the Whipple. We know that the Whipple is the best treatment we have for this type of cancer. So we have a long way to go to replace the Whipple. In the meantime, I hope that we could increase the percentage of the patients who are eligible for Whipple. After chemotherapy and radiation, only small percentage of patients is undergoing the Whipple. Those patients who have to undergo the Whipple have survived 2–3 times greater than those who were not, which may mean that they have tumors that more response to the therapy. We are still trying to figure out why some patients responded but some others don't. So it would be a big success if we can increase the percentage of patients who can go on to have the surgery. I think radiation will play an important part and in reaching that goal, but we also have a lot work to do and a lot things to learn.

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