

Camouflaged Tumour Cells Under Attack

Our immune system should treat tumour cells as enemies, but these cells have learned to camouflage themselves to escape detection, known as “immune evasion”. Research by **Dr Victor Lee Ho-fun**, Clinical Associate Professor in the Department of Clinical Oncology and Assistant Dean (Assessment) in the Faculty, aims to identify and attack the camouflaged cells involved in nasopharyngeal cancer (NPC).

NPC is most prevalent in Hong Kong and southern China due to a combination of genetic factors, exposure to the Epstein Barr virus (EBV) and a traditional diet heavy in salted fish, which contains carcinogenic substances. Typically it is treated with radiation and chemotherapy, but about 30 per cent of patients will suffer a relapse that spreads, with minimal chance for a cure.

Dr Lee’s research aims firstly to improve understanding of NPC tumours. Sometimes very small tumours at the nasopharynx will spread to the lymph nodes, while in other cases there will be a large tumour that does not spread. He is one of the first to investigate this heterogeneity in tumours, using single-cell sequencing techniques that screen the characteristics of the hundreds of millions of cells present in tumours.

“We want to identify the mechanisms involved in the evolution of NPC. If we can determine that a tumour has a low likelihood of spreading to the neck, then we won’t need to radiate there or we radiate less. Or if we find it is more likely to spread, we can apply intensified radiation and other therapies,” he said.

Last year, his department led by Professor Anne Lee Wing-mui established a new biobank of tumorous and normal cells from the nasopharynx and from the lungs, another research area he is interested, to aid in these investigations.

Dr Lee is also studying alternative or modified forms of therapy for NPC because of the limitations of radiation. Other important organs, such as the brain stem, are located close to the nasopharynx, so radiation doses have to be dialled down to avoid damaging those areas. Dr Lee is working with Hong Kong Sanatorium & Hospital to study a new radiation technique, proton therapy, that provides more finely-targeted doses that can be delivered precisely to the tumour and spare the surrounding tissue and organs.

He has also been involved in a long-term study of immunotherapy for NPC led by Professor Dora Kwong Lai-wan in the Department of Clinical Oncology and the QIMR Berghofer Medical Research Institute in Australia. Blood is taken from patients and the T-cells are trained to target the EBV antigens. An eight-year Phase 1 trial showed the therapy was safe and could extend the survival rates of patients with terminal NPC. It also helped some patients who were at high risk of recurrence to remain disease-free. A larger Phase 2 trial is now underway.

“Tumour cells should be considered enemies. If we can stimulate a patient’s own immune system to find and attack them, they will be spared the side effects of other therapies,” he said.

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Dr Victor Lee Ho-fun

進擊偽裝下的癌細胞

人體的免疫系統理應視腫瘤細胞為敵人，但是這些細胞卻很狡猾，會偽裝，逃避偵察，我們稱之為「免疫逃避」。臨床腫瘤學系臨床副教授及醫學院助理院長（考核）李浩勳醫生的研究，就是要找出及攻擊與鼻咽癌有關的偽裝癌細胞。

鼻咽癌在香港及華南地區發病率甚高，病因與遺傳因素、EB病毒 (Epstein-Barr virus) 感染、喜吃鹹魚的傳統飲食習慣有關（鹹魚含有致癌物質）。一般來說，治療鼻咽癌會採用放射治療和化學治療，但是仍然約有30%的病人會復發及擴散，而他們的治癒機會並不高。

李醫生的研究目標首先是要加深了解鼻咽癌腫瘤。有時候在鼻咽的一些非常細小的腫瘤會擴散至淋巴結，但有時候一些大腫瘤卻沒有擴散。李醫生是其中一位最先研究腫瘤異質性的專家，使用單一細胞基因排序的技術，篩查腫瘤裡以億萬計細胞的特性。

他說：「我們希望找出與鼻咽癌演化有關的機制。如果我們能夠斷定某個腫瘤擴散到頸部的可能性很低，便無需要為病人做放射治療，或者降低劑量。相反，如果我們能夠斷定擴散的可能性是高的，我們便會增加放射治療的劑量，或者，考慮其他治療方法。」

去年臨床腫瘤學系在李詠梅教授的領導下，建立了一個從鼻咽和肺部取得的腫瘤細胞和正常細胞生物資料庫，來協助上述研究，而這也是李醫生一個深感興趣的項目。

李醫生同時也在研究治療鼻咽癌的替代或改良方法，因為放射治療始終有其限制。人體的一些重要器官如腦幹位置很靠近鼻咽，因此進行放射治療時，必須調低劑量，避免對這些部分造成傷害。李醫生現時與養和醫院合作，研究新的放射治療技術和質子治療技術，目的是更精準地把劑量送至腫瘤，而不會損害周圍的組織和器官。

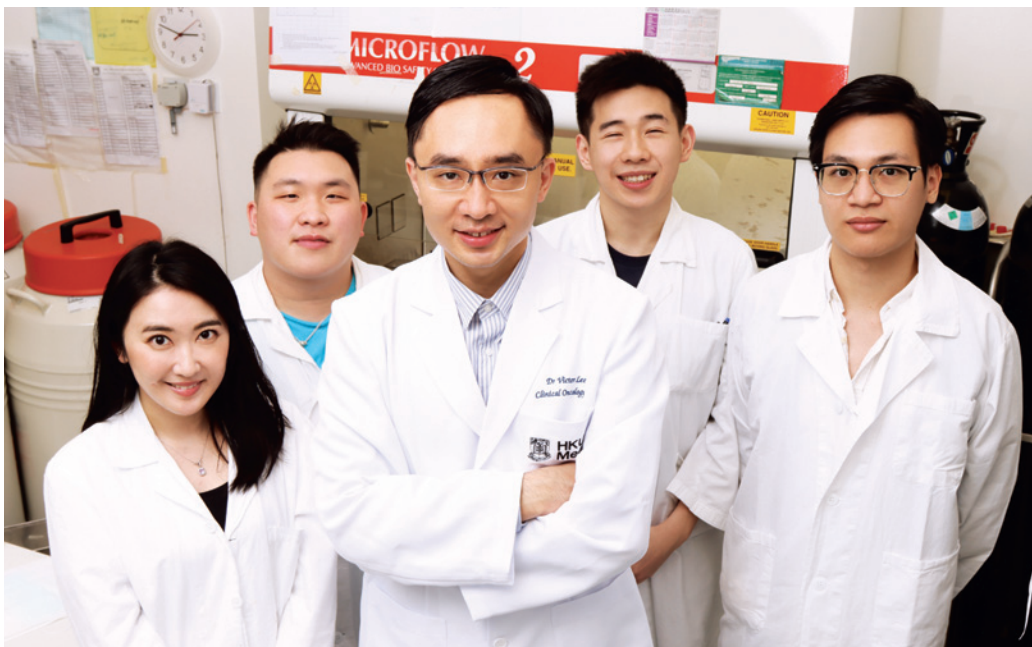
此外，李醫生也參與一項關於鼻咽癌免疫治療的長期研究，該項目是由同屬臨床腫瘤學系的臨床教授鄺麗雲教授及澳洲昆士蘭貝格霍菲爾醫學研究院領導進行。研究人員會從病人身上抽取血液樣本，然後培育T細胞攻擊EB病毒的抗原。第一期試驗長達八年，結果顯示該項治療安全，也可以提高鼻咽癌末期病人存活率。對於某些復發風險高的病人，該項治療可以推遲癌症患者再復發的機會。第二期試驗規模更大，現正在進行中。

李醫生說：「癌腫瘤細胞本被視為敵人，但是如果我們能夠刺激病人自身的免疫系統去尋找和攻擊這些癌細胞，就可以免去其他治療所引起的多種副作用。」

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Honours and Awards 榮譽與獎項

- 2019 Faculty Teaching Medal HKUMed 港大醫學院學院教學獎
- 2018 Outstanding Young Researcher Award, HKU 香港大學傑出青年研究學者
- 2014 Hong Kong College of Radiologists HKCR 15A Travelling Fellowship
香港放射科醫學院15A獎學金
- 2013 Distinguished Young Fellow of Hong Kong Academy of Medicine
香港醫學專科學院傑出青年院士



Biography 簡歷

Dr Victor Lee Ho-fun is currently Clinical Associate Professor of the Department of Clinical Oncology, and Assistant Dean (Assessment), HKUMed. He graduated from HKUMed in 2002. He then received residency training in clinical oncology in Tuen Mun Hospital and then joined the Department of Clinical Oncology, HKUMed in 2008. He obtained his fellowship in Royal College of Radiologists in Clinical Oncology in 2010. Afterwards, he received further specialist training in Institut Gustave Roussy, Stanford University and Princess Margaret Cancer Centre in Toronto. He had obtained an MD in his alma mater in 2015 for his research on nasopharyngeal cancer.

His current interests include radiation dosimetric studies on head and neck and nasopharyngeal cancer, genetic and molecular studies on head and neck and lung cancer,

stereotactic radiosurgery and stereotactic body radiation therapy, and selective internal radiation therapy for liver tumours.

李浩勳醫生為港大醫學院臨床腫瘤學系臨床副教授，他同時身兼醫學院的助理院長（考核）。李醫生在2002年畢業於港大醫學院，隨後在屯門醫院接受臨床腫瘤駐院醫生實習培訓，並於2008年加入港大醫學院臨床腫瘤學系。2010年，他取得英國皇家放射科學醫學院臨床腫瘤科院士資格。其後他於法國的古斯塔夫·魯西研究所、美國史丹福大學和加拿大多倫多瑪嘉烈公主癌症中心接受進一步的專科培訓，並於2015年在港大醫學院以鼻咽癌研究取得醫學博士學位。

李醫生的研究範疇包括有：治療頭頸和鼻咽癌的放射治療劑量學；治療頭頸和肺癌的遺傳和分子學研究；立體定位放射手術及立體定位消融放射治療；以及治療肝癌的選擇性體內放射治療。