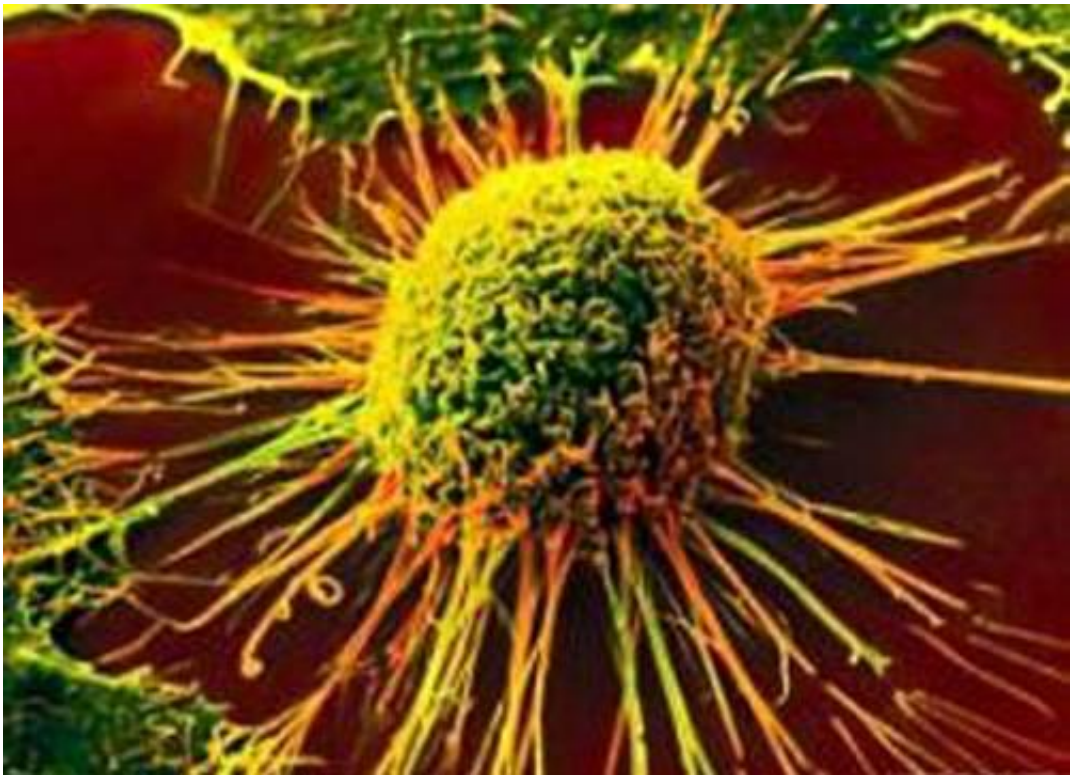
Researchers offer update on immunotherapy based cancer fighting drugs

March 27 2015, by Bob Yirka



(Medical Xpress)—A quartet of researchers affiliated with Memorial Sloan Kettering Cancer Center and Weill Cornell Medical College, have written and published a State of the Art Review piece in a special edition issue of the journal *Science Translational Medicine*—they describe recent advances in immunotherapy drugs that are being used to treat various

types of cancers. The Review piece by the authors was but one of three articles published in the special edition that are focused on offering updates on current research, clinical trial information, drugs and other pertinent information related to immunotherapy and the inroads that are being made to advance the effectiveness of boosting the body's natural ability to fight off diseases.

For many years, the traditional approach to treating cancer has centered around chemotherapy, radiation treatment and surgery—but research focusing on finding ways to help the body fight cancers via its own immune system has been ongoing as well. In their paper, the authors describe drugs that are being used to counter defensive mechanisms used by tumors to ward off attacks by the immune system—most efforts they note are focused on "training" T cells to recognize such mechanisms so that they will freely work to destroy a tumor.

Many of the new drugs that have been developed, the authors report, are focused on "checkpoints"—molecules produced by the human body that serve the purpose of stopping the immune system from overreacting. Prior research has shown that tumors are able to manipulate checkpoints in a way that allows them to mask the tumor, preventing T cells from attacking them. Recently, drugs have been developed that can override this mechanism, or to block checkpoint molecules altogether. Ipilimumab, for example, has been found to block a type of checkpoint molecule known as CTLA-4. Two other drugs, pembrolizumab and nivolumab act on PD-1, a receptor that when stimulated can cause T cells to destroy themselves. These three drugs have all been approved for treatment of advanced cases of skin cancer.

The authors note that they are just a small sample of the hundreds of drugs being developed to work directly on tumor interactions with checkpoints. The authors point out that a host of researchers are also working on a completely different class of drugs—those that are directed

at costimulatory molecules which stimulate T cells into action, ideally, against tumors that are resistant to current methods of treatment.

More information: On being less tolerant: Enhanced cancer immunosurveillance enabled by targeting checkpoints and agonists of T cell activation, *Sci Transl Med* 25 March 2015: Vol. 7, Issue 280, p. 280sr1. DOI: 10.1126/scitranslmed.3010274

Abstract

The recent approvals of two drugs that block the function of the immune checkpoint programmed cell death 1 (PD-1) have firmly planted tumor immunotherapy in the mainstream of clinical oncology. We provide a historical and immunologic context for these recent advances and discuss translational studies that provide insight into the efficacy of cancer immunotherapy at the individual patient level.