Elaine Vickers
SCIENCE COMMUNICATED LTD

Molecular Mechanisms of Targeted Treatments and Immunotherapies for Solid Tumours

Introduction

Over the course of two mornings, experienced cancer educator, Dr Elaine Vickers, guides you through many of the most relevant topics relating to modern systemic treatments for solid tumours.

The first morning's focus is on targeted treatments. Treatments that are designed to block a faulty protein or process that is over-active in cancer cells. Before turning her attention to individual treatments, Elaine will describe why we can block some things but not others. She'll also point to recent work that explains when targeted approaches work best.

The second morning is about cancer's relationship with the immune system and how our increased understanding of this relationship has led to successes with cancer immunotherapy. Elaine will focus much of her attention on the checkpoint inhibitor group of immunotherapies, which include PD-1, PD-L1 and CTLA-4 targeted antibody therapies. But she'll also explain other technologies, such as CAR T cell therapy, vaccine-based treatments and oncolytic viruses.

As ever, Elaine's presentations are full of colourful and enlightening illustrations to help learners make sense of scientific concepts. Elaine's descriptions avoid unnecessary jargon and are pitched so that even those with a limited understanding of cell biology are able to understand.

Format

Each morning's content is split over three presentations of 30-40 minutes each. Elaine will be online throughout both mornings to interact with learners and answer questions.

Audience

This content is ideal for research nurses, clinical nurse specialists, pharmacists and clinical trials coordinators. It may also be of interest to other healthcare professionals involved in the diagnosis and treatment of people with solid tumours, and to junior doctors.

About Dr Vickers

Elaine has a degree in Medical Science from the University of Birmingham and a PhD in Molecular Biology from the University of Manchester. She has worked as a specialist cancer educator and writer for almost 20 years. Her goal is to unravel the complexities of cancer biology and new cancer treatments and to make these topics interesting and accessible to non-scientists.

Morning 1:

Molecular mechanisms of targeted cancer treatments

Description of content:

Over the course of three videos, Dr Vickers guides us through the scientific concepts that underpin many of the most used targeted cancer treatments. Beginning with the bigger picture – what we can and can't target – she then describes the mechanisms of action of the two main types of treatment: monoclonal antibodies that target cell surface proteins, and small molecules that block kinases. Many of these treatments target over-active, growth factor-controlled signalling pathways. Elaine will explain the function of these pathways in healthy cells and their defects in cancer cells. She'll also describe why blocking these pathways sometimes works, and sometimes doesn't. Lastly, Elaine turns her attention to other targets and to various biomarker tests to select the right approach for each patient.

Content

Session 1 – Targeted cancer treatments – the current landscape

- Hallmarks of cancer cells – which can we target?
- The pros and cons of small molecule kinase inhibitors and monoclonal antibodies
- When they work, and when they don't

LIVE Q&A

Session 2 – Targeting cell communication pathways

- Targeting growth factor receptors: EGFR, HER2, MET
- Inhibitors of growth factor receptor fusion proteins: ALK, ROS1, RET, TRKA/B/C
- B-Raf & MEK inhibitors
- PI3K & mTOR inhibitors

LIVE Q&A

Session 3 – Other targets and treatments

- Angiogenesis inhibitors
- PARP inhibitors
- CDK inhibitors
- Biomarkers of response and resistance

LIVE Q&A

Morning 2:

Molecular mechanisms of immunotherapy

Description:

The focus of this morning is on cancer's relationship with the immune system, and how this knowledge is being used to improve the outlook of people with various solid tumours. Elaine describes how checkpoint inhibitors boost cancer-fighting T cells. She also highlights some of the lessons learned through the hundreds of clinical trials with checkpoint inhibitors that have taken place over the past decade. Lastly, Elaine explains how other forms of immunotherapy aim to create an anti-cancer immune response.

Content

Session 1 – Cancer's relationship with the immune system

- A brief introduction to the immune system
- How cancer's relationship with the immune system changes over time
- How the immune system can recognise and react to the presence of cancer in the body
- Mechanisms of immune-evasion by cancer cells
- Introduction to immunotherapy and the importance of T cells
- Reasons why immunotherapy sometimes does work and sometimes doesn't

LIVE Q&A

Session 2 – Immunotherapy with checkpoint inhibitors

- Introduction to T cells and checkpoint proteins
- Mechanism of action of checkpoint inhibitors
- Spot the difference: CTLA-4 and PD-1/P-L1 targeted checkpoint inhibitors
- Examples of results and lessons learned from clinical trials

LIVE Q&A

Session 3 – Cancer treatment vaccines, CAR T cell therapy and TCR-engineered T cells

- Cancer vaccines: peptide, DNA, dendritic cells, oncolytic viruses
- CAR T cell therapy for solid tumours, are we making progress?
- Another option: TCR-engineered T cells
- What's the future of immunotherapy for solid tumours, and how do we get there?

LIVE Q&A