

An introduction to precision cancer medicine

This programme provides learners with an understanding of the concepts that underlie precision cancer medicine and both its promise and limitations.

Course overview

The fundamental idea of precision medicine is to offer each cancer patient a treatment approach that is tailored to the unique biology and genetics of their disease.

[Dr Elaine Vickers](#) – a leading independent educator on the science of new cancer treatments – translates complex and often overwhelming topics into easily digestible and understandable knowledge, using colourful illustrations to explain scientific concepts.

She will explain how far we are able to use precision medicine by exploring the features of cancer we can target now, and where we might get to in the future. She will also look at when precision medicine fails, and why expectations and realities don't always align.

The course comprises two morning sessions (3 hours per session) delivered online via Microsoft Teams:

Detailed description

Morning One:

This morning Elaine introduces the scientific concepts that underpin the concept of precision medicine. She looks at the features of cancer cells that we can target, the treatments available, and the tests and technologies needed to match targets with treatments. She also provides an example of where a precision approach is already being used.

What does precision medicine mean?

- What's the big idea?
- What treatments are we working with?
- What can we target, and what can't we?
- Do we have a treatment for every person with any cancer?
- How does immunotherapy fit in?

The treatments at our disposal and an example of where precision medicine is already (at least somewhat) a reality

- The treatments we use in precision medicine:
 - Antibody-based treatments
 - Small molecule kinase inhibitors
 - Immunotherapies
- Precision medicine for non-small cell lung cancer: EGFR, ALK, ROS1, RET, MET, TRKA/B/C, B-Raf, K-Ras G12C inhibitors

Testing methods and potential treatment targets

- What can we test for?
- Where to look? Archived biopsy vs. fresh tumour sample vs. 'virtual biopsy'
- Testing for individual mutations, several mutations, or the presence of proteins
- Testing against a panel of mutations
- Looking for patterns of mutations e.g. MSI-High, mutation signatures
- What information do commercial testing platforms provide?

Morning Two:

Elaine turns her attention to the limitations and current realities of precision medicine. Elaine describes why a precision approach isn't always possible or might not give the best outcome for a patient. She uses the results from a variety of precision clinical trials as her examples. She also describes the progress we've made in offering a precision-approach to people with three of the most common cancers: breast, bowel, and prostate.

Do we understand how to make a good match?

- Reasons for sensitivity or resistance to targeted therapies
- Unsolved questions in precision medicine:
 1. How important is timing?
 2. Which mutations should we target?
 3. Is every mutation tumour agnostic?
 4. Which clone of cancer cells should you target?
 5. How well do you need to know the patient?
 6. When should you give immunotherapy?

Are people better off when treated through precision medicine?

- Brief overviews of four precision medicine trials: SHIVA, MOSCATO-1, IMPACT, NCI-MATCH
- In more detail: I-PREDICT & SAFIR02-BREAST

Where have we got to and where do we go from here?

- Current and future opportunities for precision medicine for:
 - breast cancer
 - bowel cancer
 - prostate cancer
- When is it that a precision approach truly works?
- Final thoughts:
 - Not every treatment (or patient) requires a precision approach
 - Don't underestimate the benefits of palliative care



About Elaine Vickers

Dr Elaine Vickers, PhD of [Science Communicated Ltd](#) has worked as a cancer educator for over twenty years and has previously acted as science communicator for three of the UK's leading medical research charities, including four years in the Science Information team at Cancer Research UK.

She is passionate about demystifying the science behind cancer biology and the latest cancer treatments such as kinase inhibitors, monoclonal antibodies and immunotherapies. Elaine is experienced in teaching people with any level of scientific or medical knowledge from cancer patients through to medical oncologists.

Her book, A Beginner's Guide to Targeted Cancer Treatments, was commended by the British Medical Association book awards. A second edition is due out in 2024.

