



A study of DCA

Students consider the drug DCA and the claim that it is a cheap and safe drug that kills most cancers. Using an article produced by Cancer Research UK, they consider how informative the article is and generate further questions that might enhance their understanding of DCA and its implications for the cancer drug industry.

Outcomes

Students will be able:

- to explain how DCA works and its effectiveness as a cancer drug
- generate questions after reading an article
- achieve a clearer perspective on what DCA can do, and what the current position is in terms of DCA research and licensing for public prescription
- be able to discuss the implications of drug availability and licensing.

Resources required

Article from Cancer Research UK

<http://info.cancerresearchuk.org/news/behindtheheadlines/dca/>

Time required

60 minutes plus homework activity.

Outline of the activity

Part 1, students should individually read the article on DCA as presented on the Cancer Research UK website. This should take approximately 5-10 minutes.

In groups of 3-4 they answer the questions on the worksheet, taking approximately 10-15 minutes. Each group then presents their answers to the class.

Part 2, working in the same groups the students generate questions relating to information they would like to find in order to gain a better understanding of DCA.

Whole class compilation of questions should facilitate a discussion, generating possible homework research tasks. The combined research can be shared by distributing or presentations.

Answers to questions in part 1

1. What does DCA stand for?
 - *dichloroacetate*
2. What is the function of the 'mitochondria'?
 - *to help cells generate energy and also to trigger death if faulty*
3. How do cancer cells evade 'death'?
 - *they switch off their mitochondria*
4. Describe briefly how DCA works as an anti-cancer drug.
 - *adding DCA to cancer cells turns back on the mitochondria which then results in the cancer cells not multiplying and dying out*
5. Give 2 reasons why DCA is considered unsafe.
 - *significant side effects on the nervous system and it's an environmental pollutant*
6. Give 2 reasons why 'off patent' drugs might be problematic.
 - *they are not licensed for use which means they have not been rigorously tested and approved. People may buy them over the internet and use them without proper medical monitoring*



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Tips and strategies



In part 2 of the activity the following websites provide useful information about DCA.

<http://www.depmed.ualberta.ca/dca/>

<http://www.thedcasite.com/>

<http://www.newscientist.com/article.ns?id=dn10971>

<http://news.bbc.co.uk/2/hi/health/6506113.stm>

The Cancer Research UK article could be printed off (3 pages) and given to the groups to read collectively.



A case study of DCA: briefing sheet

Part 1

Read the article from Cancer Research UK entitled *Behind the headlines - Questions over DCA 'cancer drug'* and answer the following questions:

- 1 What does DCA stand for?
- 2 What is the function of the 'mitochondria'?
- 3 How do cancer cells evade 'death'?
- 4 Describe briefly how DCA works as an anti-cancer drug.
- 5 Give 2 reasons why DCA is considered unsafe.
- 6 Give 2 reasons why 'off patent' drugs might be problematic.

Part 2

1 Complete the table below.

	Yes	unsure	no
I understand what DCA is			
DCA is a 'wonder drug'			
DCA research should be funded from taxes			
Cancer Research UK provide unbiased information			
All cancer drugs should be freely available regardless of cost			

- 2 Discuss whether or not you consider this article to be informative enough for the purposes of your Science in Society course.
- 3 Now generate four questions which you consider would further aid your understanding of DCA.
- 4 In your group or class, agree on the questions to be researched, and allocate one question per student.

Your summary of your research should be in a form that can be presented or distributed to the other students.