**Developing Medicines**

Approximate timing: 50-60 minutes

Required resources: PowerPoint presentation (supplied), slide handout (optional), internet connection

This lesson will introduce students to the thalidomide tragedy, why it occurred, what the consequences were for its victims and the measures that have been taken to prevent similar events in future. It will also look at the drug discovery process.

The lesson supports:

* AQA GCSE Biology 4.3.1.9 Discovery and development of drugs
* OCR GCSE Gateway Science Biology A B6.3q
* OCR GCSE Twenty First Century Science Biology B B2.5 and B2.6

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| **Learning outcomes** |
| All students will: | Know the stages of drug development |
| Most students will: | Explain why animals are used in research |
| Some students will: | Analyse why new drugs may fail  |
| Key word/s | Placebo, Blind Trial, Double Blind Trial |

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| **Teaching notes** | **Student learning activities**  |
| **Starter** ( 5mins )Teacher monitoring starter, then goes over students’ answers | Slide 1Students should name medicines or treatments they have received, explaining what these treated. |
| **Development** ( 10 mins) May want to do slide 2 activity as think/pair/share. Potential answers on Slide 3  | Slide 2Students consider what they need to know about a medicine. Then feedback to the teacher.Slide 4 – Students spend 1 min to consider one of the four questions, 1 minute sharing thoughts with person next to them, then everyone feeds back ideas to teacher. |

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| **Main** (30-40 mins)Support students in considering what order the drug development process would come in.Go over slide content then watch video at bottom. Stop video on scientific models after 2:15. Go over slide 8 with students.Slide 9 – Think/Pair/Share. Possible points:Computer model only as good as data that made it, more to drug effects than metabolismHuman tissue isn’t whole organism so can’t see how cancer spreads or whether other organs are affected (maybe other parts of body help to fight off cancer)Yeast cells are not the same as human cells, many different human cells that react differentlySlide 10-11 – students read and note down points. Question on 11 is because two animals increase information and one must be a larger mammal which is more similar to humans. | Slide 5-6 Students order the drug development process (see last ppt slide for printout). Answers on Slide 6.Slide 7 – students watch video. Then read slide 8.Slide 8 – students read and note down.Slide 9 – Students consider alone and in pairs how effective various non-animal methods may be as well as where their limitations might beSlide 10-11 – students read and note down points.Slide 12-13 – key information about human trials. |
| Plenary (5 mins)Plenary questions are linked to initial learning objectives.  | Slide 14Students answer question on slide 13 to assess learning. |
| Homework |  |