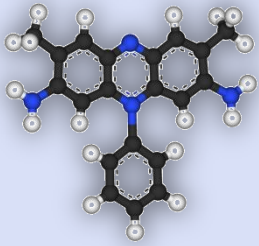


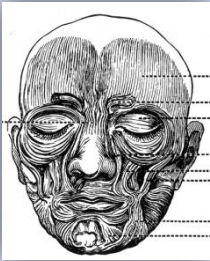
Science in the news



Atomic bond types discernible in single-molecule images

What determines the different shapes of the bonds in these amazing images?

snapshotscience.co.uk/go/r



Genes for face shape identified

How could this possibly help forensic scientists in the future?

snapshotscience.co.uk/go/s



New monkey identified in Africa

Why is this important news for conservationists?

snapshotscience.co.uk/go/t



Richard III's final resting place?

What evidence is needed before we know for sure?

snapshotscience.co.uk/go/u



If the Mars rover finds water, it could be H₂ ... uh oh!

Why do NASA scientists hope that Curiosity will **not** find water?

snapshotscience.co.uk/go/v



SPIDER-GOAT, SPIDER-GOAT...



Credit: the gradigal untitled 3 @ Flickr

*...does whatever a spider-goat does.
Can she swing
from a web?
No she can't
she's a goat...
...however, she can produce spider silk proteins in
her milk.*

THE STORY

You may have watched the Horizon programme *Playing God* on BBC2 on Tuesday, and if you didn't there is still time to catch it on iPlayer. If you are teaching about genetic engineering it is well worth spending time watching it as it covers some amazing uses of this branch of biotechnology.

Despite the range of 'synthetic biology' examples out there, in this post I have decided just to concentrate on the spider-goats, the transgenic poster girls of the moment.

Spider silk is incredibly lightweight yet strong. It is five times stronger than steel of the same diameter. It is also biodegradable and compatible with the human body. This amazing material has a myriad of applications in industries as diverse as space flight, fashion and neurosurgery.

There is no wonder that biotechnology companies have been scrambling to find a successful way of mass producing it over the past few years. Attempts have included farming spiders (fail - they tend to eat each other), and the genetic modification of different organisms such as tobacco plants, before Nexia Biotechnologies was successful with the modification of goats that expressed the silk proteins in their milk. The spider-goat was born.

TEACHING IDEAS

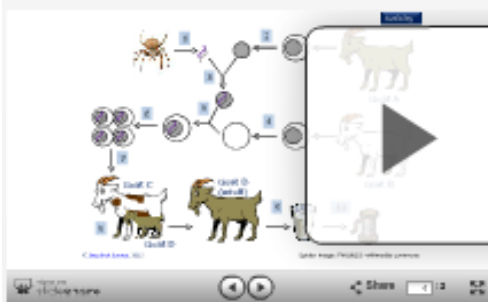
A novel material

Silk is a natural polymer so you could use this as an example when teaching about materials in GCSE chemistry. Can the students match up it uses to its properties? For example, it could be used instead of nylon in fishing lines because it is strong but biodegradable and therefore better for the environment.

As I have already covered, silk has properties that often mean it is a better choice of material than its more traditional rivals. Students can research into the advantages and disadvantages of silk compared to another material for a range of applications.

Genetic engineering

The actual process by which the goats were created is an example of genetic modification. This resource can be used to teach the method and can be used with KS3 students when studying recombinant DNA or as a way of extending the more able at GCSE.



download

Students are given slide 2 printed out as cards. They have to use the diagram on slide 1 to put the statements in the correct order to show the method used. Slide 2 contains some extension questions.

Ethical questions

Of course, there is scope for an ethical debate on this and other examples of transgenic animals. Are the scientists 'playing God' (as the title of the Horizon programme mentioned suggests) and what opinions do your students have about the ethics surrounding the spider-goats?

WEBLINKS

Video clip of the Horizon programme showing the spider-goats.

Topical stories and events to use in KS2-5 science lessons.

Show students how science relates to real-life.

Teaching ideas on how to use each story in lessons.

Free, downloadable resources.

Weblinks to useful news stories, videos and other resources.