

# iTRANSFUSEFACTSHEET

all about blood



## WHAT COULD I POSSIBLY NEED TO KNOW ABOUT WOOLLY MAMMOTH'S BLOOD?

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### What is a woolly mammoth?

Woolly mammoths were a lot like modern elephants and were known for their long, curved tusks and thick layers of hair. They became extinct about 4,000 years ago. Bones and frozen, mummified mammoths are often discovered across Siberia, Alaska and northern Canada.

### Why study extinct animals such as the mammoth?

We can now study many aspects of extinct animals and measure how they functioned as if they were alive today. Advances in biology mean that tiny scraps of DNA can be retrieved from ancient biological specimens – this is called paleobiology.

### What can DNA from a mammoth tell us?

The DNA can tell us about mammoth haemoglobin, the protein found in red blood cells responsible for carrying oxygen around the body.

### How was the mammoth's blood resurrected?

Scientists determined the DNA code of the mammoth's haemoglobin from fossil bones. The DNA they extracted from the fossil was inserted into bacteria, and bacteria made actual woolly mammoth haemoglobin!

### Why is this relevant to Christmas?

Father Christmas lives in the Arctic and we wanted to know how he manages to look so jolly, and avoids frostbite. Normal human haemoglobin is sensitive to changes in temperature and gets sticky as it gets cold, so it can't deliver enough oxygen to the extremities in cold temperatures. This is why humans get frostbite in extreme



cold climates. We suspect Father Christmas might have something in common with the woolly mammoth.

### What is special about the mammoth's haemoglobin?

Mammoth haemoglobin is completely temperature-insensitive. This is thought to have allowed the mammoth to survive in the Arctic when the body extremities (tail, ears, etc) were very cold, oxygen was still safely delivered to these tissues.

Maybe Santa also has a special haemoglobin ... or really warm boots and gloves.

### Why should I be interested in the mammoth's haemoglobin?

Science may eventually be able to create artificial blood with the modified haemoglobin

**PACKFACT**  
Before reindeer were invented, woolly mammoths pulled the sleigh.



to use in brain and heart surgery where the body is cooled. The Blood Service also uses extreme cold to store various blood components. Learning about different haemoglobins could help that process.

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