

Microbe Magic

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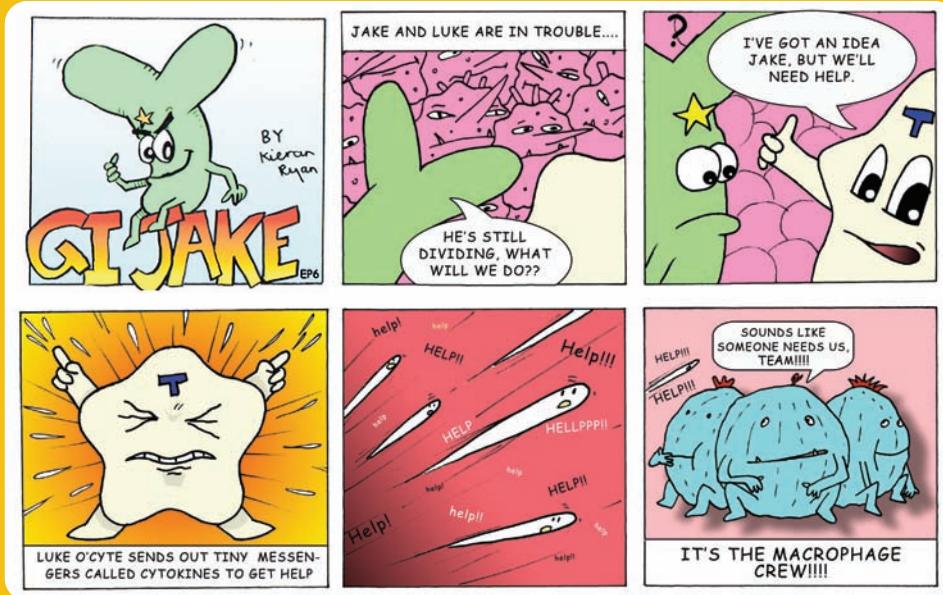
ISSUE ONE 2006



Hello,

A cartoon illustration of a green frog with large eyes and a wide smile, pointing its right hand towards the text.

Nice to meet you all again. We visited so many schools in the last few months that we think we have met most of our readers by now! We hope you enjoyed the talk on your immune system and that you are all staying healthy.



Please circulate to your friends



Montreal, Canada



In Montreal with APC scientists

Cork, Ireland



Aoibhínn Ní
Shúilleabháin, Rose of
Tralee 2005 at UCC
Open Day

Paris, France



GI Jake at the Eiffel Tower

Mauritius



GI Jake & Luke O'Cye at the beach

GI Jake World Traveller!!!

Since the last issue of Microbe Magic, I met this year's Rose of Tralee, who happens to be a Scientist. I attended a few conferences, one in Montreal, Canada and another in Paris, France. Both cities were fantastic. I took a few French lessons before I went, which turned out to be very useful when I went to Mauritius with my friend Shomik, for my Christmas holidays. Until next time 'Au Revoir'!

Q. The same language is spoken in Canada, France and Mauritius. Do you know what it is?

GI JAKE INTERVIEW

with Aisling Judge

BT Young Scientist of the Year 2006

Jake: Congratulations on winning the Young Scientist Exhibition! Tell us about your project.

Aisling: Well Jake - you know that some of your distant bacterial relatives are pretty nasty and can make people very sick. They can make food go rotten very quickly in warm temperatures! So I invented an indicator that can be put on a milk carton (or other food packages) that changes colour if the food is likely to have gone off because it has been stored at too high a temperature. So if you leave your food sitting on the counter overnight the indicator colour will change to warn you.



Jake: You must be really smart! How did you come up with that idea?

Aisling: My dad was always giving out about the milk in our fridge going off and this gave me the idea, but, I don't go along with the smart bit ... You see Jake, I just took that comment and started to wonder about it. The next step was easy! I googled the words milk & sour and got ideas about how the milk was going off and this set me on the road to my invention. Professor Colin Hill, who works at the APC, helped me with my project.

Jake: What's your favourite subject?

Aisling: This might surprise you, but it is actually PE. I'm a sports maniac!

Jake: Your family and friends must be very proud! How does it feel to be famous?

Aisling: It's brillo! Everyone knows you. People I meet often ask 'Are you the science girl?' People have been very nice, I was even asked to lead the Kinsale St. Patricks Day Parade.

Jake: What do you like to do in your spare time?

Aisling: I play gaelic football, basketball, Tae Kwon Do and one of my favourite sports is sailing a small dinghy. I sailed in a competition in the Netherlands at Easter. I'm also a great fan of Liverpool and like to chill out by watching TV or reading a book.

Jake: It was great talking to you. I hope someday we'll get a chance to work together in the APC. That would be great fun!

Check our website for the full interview with Aisling Judge

RIGHT: Congratulations also to Ruby Jennings and Ellen Hegarty from St. Peter's Community School in Passage West, who came 3rd in the Biological and Ecological Junior Category. Ruby and Ellen are pictured here with Dr Sally Cudmore (APC), Luke O'Cyte, Ms Martina Drohan (Teacher), GI Jake & Dr Catherine Buckley (APC).



A-Z of the gut

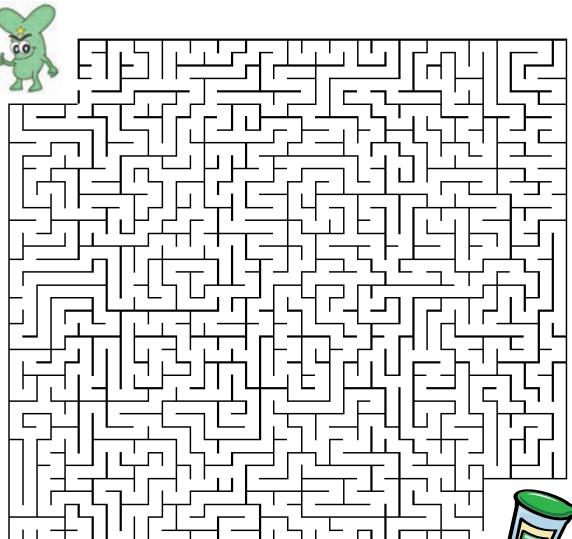
Gastrointestinal tract: Another word for the alimentary canal. It is the long tube, through which food travels from your mouth to your bum. It is over 8 metres long.

Immune system: helps protect your body from disease by fighting infections and illnesses. Your immune system plays a very important role in keeping you healthy and strong.

Lactobacillus: A good bacteria which lives in our large intestine and convert simple sugars to lactic acid. It is also found in foods like yoghurt and cheese.

Helicobacter pylori: Bacteria that cause ulcers in the stomach.

GI Jake loves yoghurt. He can smell the yoghurt below because of the odour molecules- can you help him find it?

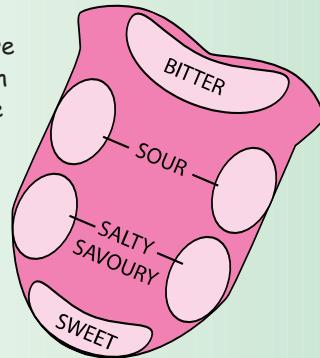


Taste and Smell

Taste is a very important part of eating as it boosts appetite and protects us from danger (e.g. poisons). Our tongues and mouths have special cells called taste receptors that recognise 5 different types of taste -

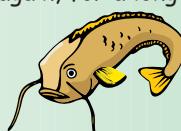
- Sweet
- Salt
- Sour
- Bitter
- Umami (savoury taste).

The senses of smell and taste are closely linked. We can distinguish over 10,000 smells and our sense of smell is much more sensitive than our sense of taste. Many flavours are recognised mainly through the sense of smell. If you hold your nose while eating chocolate, for example, you will have trouble identifying the chocolate flavour, even though you can taste its sweetness. This is because the familiar flavour of chocolate is sensed largely by smell. So is the flavour of coffee.



Have you ever noticed that when you have a cold your food tastes bland? This is because you cannot smell it. When we smell or eat food, odour (another word for smell) molecules from that food travel through the passage behind your nose and mouth to special receptor cells in our brains. Our brains then decide if we should eat the food.

Memory is also important - if you have been quite ill following eating a certain food, you will usually remember that and therefore probably not want to try that food again, for a long time!



DID YOU KNOW...?

- Catfish have the most taste buds of all animals - 27,000. Pigs have 15,000. Can you guess how many humans have? See <http://microbemagic.ucc.ie> for the answer
- Butterflies have taste receptors on their feet and octopus have them on their tentacles. Can you guess why?
- The earthworm's body is covered in taste receptors.
- Sniffer dogs, bees and wasps smell at least 1000 times better than humans.
- Our taste receptors work better when they are wet.
- As you grow older, your sense of smell gets worse. You can smell best when you are 10 years old!!
- Women's sense of smell is better than that of men.

Teachers, see
<http://microbemagic.ucc.ie/teachers.php>
for teacher's notes



Teachers Task - Experiment Time!

Experiment Title: How your senses of smell and sight help you taste foods.

Without your sense of smell and sight you may not be able to tell the difference between foods - especially if the foods all have the same texture (for instance, different flavoured jelly beans, fruity yoghurt).



MATERIALS NEEDED:

- Blindfolds (1-2 per group) / or just close your eyes
- Foods to taste e.g.
 - different fruit and vegetable slices (e.g. apple, pear, melon)
 - a variety of yoghurts (e.g. strawberry, raspberry, peach)
 - different flavoured crisps
 - different flavoured sweets (e.g. jelly tots)

METHOD:

- Split the class into four groups, one for each food type above.
- Blindfold 1-2 pupils in each group and ask them to pinch their noses (no sight and no smell).
- Offer them one flavour of the food at a time. Can they identify it? Write down their answer in a results table like that below.
- Offer them the next food and ask them to guess what it is.
- Ask them to unpinch their noses (but keep the blind folds on = no sight), and offer the same foods again. Now do they know what it is?

RESULTS TABLE:

Food Type:	Identified as: (no sight, no smell)	Identified as: (not sight)
Food 1:		
Food 2:		
Food 3:		

CONCLUSIONS:

What are the outcomes of your experiment?
Could the students identify food when they couldn't see and smell? How about when they could see but could not smell? What does this tell you about how you taste your food?

IMMUNOLOGY LESSON

The body's defence system



Our bodies have a special defence system, called the immune system, that protects us against germs and fights infections. The immune system attacks pathogens (germs) that invade our bodies and cause disease. The main types of microbes that can make us sick are bacteria, viruses and fungi. But remember, not all microbes are bad. There are lots of good ones like the bacteria that live in our gut (Bifidobacterium, G.I. Jake) and help us to digest our food.

Our immune system defends us in two ways: (1) preventing germs from entering using barriers such as skin. This is called the first line of defence and (2) by fighting infections that do enter our bodies, this is known as the second line of defence. Today we will learn about the first line of defence.



Each part of our body is masterfully designed to prevent germs from entering.

- The inside of your noses are covered in tiny hairs, which trap dust and germs when you breathe in. When you sneeze or blow your nose, you remove these.
- The saliva in our mouths has special chemicals called enzymes that kill bad microbes.
- Our tears also contain enzymes. If dirt gets into your eyes, they'll often start tearing. This is your body's way of washing your eyes clear of any germs.
- Ears have wax inside them and that sticky stuff traps dust, dirt and germs, preventing them from entering the ear.
- Our body is covered with skin and this acts as a shield to microbes, preventing them from entering our organs, blood and muscles. Sometimes this barrier is broken, for example, when you cut yourself. However, your body very quickly reacts by clotting the blood and forming a scab.



Check out the next issue of Microbe Magic to learn about the second line of defence and how our friend Luke O'Cyte helps us to fight infections that enter our body.

Competition: Wordsearch

Find the words underlined in the immunology lesson and with the remaining letters reveal the hidden message

S	S	C	D	I	G	E	S	T	S	D	A
R	N	T	H	H	G	E	E	E	F	I	I
I	O	E	R	E	M	I	B	S	R	S	G
A	I	T	E	Y	M	O	J	E	L	E	I
H	T	G	Z	Z	R	I	T	A	R	A	C
V	C	N	N	C	E	C	C	M	K	S	L
I	E	N	I	U	A	E	S	A	O	E	O
R	F	M	F	B	F	D	E	F	L	E	T
U	N	P	A	T	H	O	G	E	N	S	T
S	I	E	T	Y	C	O	E	K	U	L	I
E	C	N	E	F	E	D	S	E	S	O	N
S	R	E	I	R	R	A	B	N	C	E	G

Ask A Scientist

If you have any questions you would like to ask a scientist - why not post or e-mail them to us (Ask a Scientist, Alimentary Pharmabiotic Centre, UCC or apc@ucc.ie). We will display answers to the questions on the Microbemagic website (<http://microbemagic.ucc.ie>) and in our next newsletter. The best 5 questions will receive a Luke O'Cyte.

QUIZ WINNERS!



Ann O'Hara & Kieran Ryan with Siobhan Buckley, Bolomore, Rathcoole, Mallow, Co. Cork. Other winners were Danielle McGregor & Ellen Hannon, Ballinspitple National School & Fred McElroy, St. Multose School, Kinsale.

Congratulations to all the winners!

See the Microbe Magic website for correct answers.

The Alimentary Pharmabiotic Centre is a research centre funded by Science Foundation Ireland and is a partnership between University College Cork, Teagasc (Moorepark) and Industry.



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