

PUBLIC ENGAGEMENT

Some Examples

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BEATING THE SUPERBUG - *Clostridium difficile*

Rachel Ng, Michelle Kelly, Sarah Kuehne, Alan Cockayne & Nigel P Minton



Clostridium difficile infection is the most important cause of hospital-acquired diarrhoea. It is an anaerobic bacterium present in the gut of up to 3% of healthy adults and 66% of infants. *C.diff*, however, rarely causes problems in children or healthy adults, as it is kept in check by the normal bacterial population of the intestine. When certain antibiotics disturb the balance of bacteria in the gut, they can multiply rapidly and produce toxins which cause illness and death. It is 7 X more deadly than MRSA and spreads rapidly by resistant spores.

PREVENTION

Working with major pharmaceutical companies to develop new vaccines to protect against disease.



Ras Jensen, Kim Chan, Sheryl Philip, Michelle Kelly, Steve Cartman

THE CLOSTRIDIA RESEARCH GROUP



DETECTION

Working with leading diagnostic companies to develop rapid methods to detect *the bug* at the patient's bedside.



Mark Coltery, Fiona Hamilton, Gemma Marsden

ERADICATION

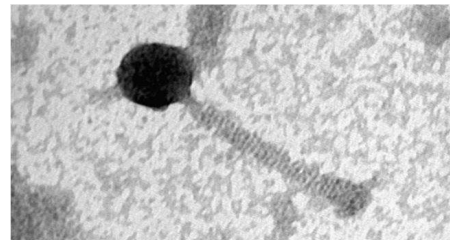
Improved killing of spores of the bug on hospital surfaces by understanding how spores change into the bacterial cells which cause disease.



David Burns, Alex Faulds-Pain, John Heap

PHAGE THERAPY

Isolating and exploiting natural viral predators of the bug to protect against infection.



Tom Bailey, Sarah Kuehne, Klaus Winzer

NEW DRUGS

Using advanced genetic tools to identify points of weakness in the bug which can be targeted with chemical drugs.



Soza Baban, David Walker, Magda Fit, Manisha Patel, Rachel Ng



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Nottingham scientist to lead £3m C. diff study

Monday, January 19, 2009, 11:59

SCIENTISTS at the University of Nottingham are leading a study into the most lethal strain of hospital-acquired infection.

The three-year European study, which will cost £3m, will use technology developed in Nottingham to study the genetic code of the bacteria of clostridium difficile, or C. diff.

Clostridium difficile bacteria attack the intestine and people who have been treated with anti-biotics are particularly vulnerable to infection.

Nottingham's Hyperdiff study will involve partners from the UK, Slovenia, Italy, France, The Netherlands and Germany and is funded with a grant from the European Community.

It is hoped the study will lead to better tests to diagnose 'super' strains of C. diff, more effective treatment, and possibly a vaccine.

Incidences of C. diff have increased over recent years and now new 'hypervirulent' strains have developed, which cause more severe disease and are more difficult to treat.

During the three-year study, scientists at the University of Nottingham will use a technology called ClosTron to produce mutant versions of the hypervirulent strains.

They will knock out genes one by one and then compare the mutant version to the standard organism to find out how each cell works.

Leader of the study, Professor Nigel Minton at the University of Nottingham's School of Molecular Medical Sciences, said: "These hypervirulent organisms seem to be taking over as the dominant strain in outbreaks and, worryingly, there are only two antibiotics which are still effective against them.

"There is a very real danger that total resistance may arise, and if that happens then this will become an extremely serious problem.

"The idea behind the study is that we investigate the genomes of the hypervirulent strains and identify their differences to the so-called standard strains. In this way, we should get a clearer picture of the whole range of factors involved in its spread and the way in which it causes disease."

C. diff levels at Nottingham's hospitals have been dropping since November 2007 and are currently below monthly targets.

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Gene technology to fight lethal hospital acquired infection

19 January 2009

PA9/09

Scientists at The University of Nottingham are leading a major European study to unravel the genetic code of one of the most lethal strains of hospital acquired infections.

The £3 million, three-year study will use gene knock-out technology developed in Nottingham to study the function of genes in a 'super' strain of the bacteria *Clostridium difficile* to discover why it causes more severe disease, kills more people, is harder to eradicate and more resistant to antibiotics.

It is hoped that the HYPERDIFF study, which involves partners from the UK, Slovenia, Italy, France, The Netherlands and Germany and is funded with a grant from the European Community, will lead to better tests to diagnose 'super' strains of *C.difficile*, more effective treatments and, possibly, even a vaccine to protect against the disease.

Since the turn of the new millennium there has been a dramatic increase in the incidence of *C.difficile*. Currently the most frequently occurring healthcare associated infection, last year it killed more than seven times as many people in the UK as MRSA. Reasons for this increase may include improvements in reporting procedures, the increasing age of the population as the elderly are especially vulnerable, lower standards of hygiene and overcrowding on hospital wards.

However, a further significant factor has been the arrival in Europe of so-called 'hypervirulent' strains such as ribotype 027, which are responsible for more severe disease and are more difficult to treat.

Currently, scientists know that the bacteria cause disease by sticking to epithelial cells of the gut lining

and releasing two toxins that damage cells leading to the tell-tale symptom of severe diarrhoea. However, there is very little known about the ways in which the bacteria operate and why the strain should be more severe than its less virulent cousins.

Leading the study, Professor Nigel Minton in The University of Nottingham's School of Molecular Medical Sciences, said: "These hypervirulent organisms seem to be taking over as the dominant strain in outbreaks and, worryingly, there are only two antibiotics which are still effective against them. There is a very real danger that total resistance may arise, and if that happens then this will become an extremely serious problem.

"The idea behind the study is that we investigate the genomes of the hypervirulent strains and identify their differences to the so-called standard strains. In this way, we should get a clearer picture of the whole range of factors involved in its spread and the way in which it causes disease."

During the three-year study, scientists at Nottingham will use a technology called ClosTron to produce mutant versions of the hypervirulent strains. They will knock out genes one by one and then compare the mutant version to the standard organism to assess the function of each cell.

The project will also investigate whether pets and other domesticated animals are carriers of the bacteria and what effect this may have had on the rise of *C.difficile* as a community acquired infection.

— Ends —

Notes to editors: The University of Nottingham is ranked in the UK's Top 10 and the World's Top 100 universities by the Shanghai Jiao Tong (SJTU) and Times Higher (THE) World University Rankings.

It provides innovative and top quality teaching, undertakes world-changing research, and attracts talented staff and students from 150 nations. Described by The Times as Britain's "only truly global university", it has invested continuously in award-winning campuses in the United Kingdom, China and Malaysia.

Twice since 2003 its research and teaching academics have won Nobel Prizes. The University has won the Queen's Award for Enterprise in both 2006 (International Trade) and 2007 (Innovation — School of Pharmacy), and was named Entrepreneurial University of the Year at the Times Higher Education Awards 2008.

Its students are much in demand from 'blue-chip' employers. Winners of Students in Free Enterprise for four years in succession, and current holder of UK Graduate of the Year, they are accomplished artists, scientists, engineers, entrepreneurs, innovators and fundraisers. Nottingham graduates consistently

excel in business, the media, the arts and sport. Undergraduate and postgraduate degree completion rates are amongst the highest in the United Kingdom.

More information about C.difficile can be found on the web at www.clostridia.net

Partners in the HYPERDIFF project are: Professor Maja Rupnik, Institute of Public Health Maribor, Maribor, Sweden; Dr Paolo Mastrantonio, Istituto Superiore di Sanità (The Italian National Institute of Health), Rome, Italy; Professor Anne Collignon, Université Paris Sud XI, Paris, France; Dr Ed Kuijper, Leiden University Medical Centre, Leiden, The Netherlands; Professor C. von Eichel-Streiber, tgcBIOMICS GmbH, Mainz, Germany; Professor Peter Mullany, University College London, Eastman Dental Institute, London, UK.

More information is available from **Professor Nigel Minton** on +44 (0)115 846 7458, nigel.minton@nottingham.ac.uk; or Emma Thorne, Media Relations Manager in the Communications Office at The University of Nottingham, on +44 (0)115 951 5793, emma.thorne@nottingham.ac.uk



Print

IN 1997, an evaluation of Theatre Debate, commissioned by The Wellcome Trust and carried out by Y. Touring – which addressed controversial science topics using dramatic performance and debate concluded that:

'Arts projects such as these were seen to be very successful in delivering science education. The drama is a way into a lot of areas and enhances the subject especially for those who are alienated or threatened by science. The Gift (one of the science topics) successfully contributes to science teaching – its strength is in personalizing science rather than delivering biological information.'

The sciences, including microbiology, are often perceived as challenging subjects to communicate. The Society is constantly looking at new ways to encourage a greater public understanding of microbiology and finding alternative approaches to engage with new audiences – including those not necessarily interested in microbiology.

In September 2009, the Society agreed to sponsor Cheltenham Science Festival and put on two activities for the general public. This was an ideal opportunity for us to try something new, and it was at this point that an idea which had been bubbling around in the back of Dariel's mind finally hatched, and the drama *Stopping the Spread of Superbugs* was born. However, that was just the beginning of a very long, sometimes frustrating, but ultimately rewarding experience to give this project wings so it could fly. Bringing together experts from the

Cross-curricular drama has been used for many years to engage the public with scientific issues and to support meaningful science learning in schools, allowing participants to reflect on the nature of science. Two major strategies have developed: the first uses real-life social simulations to provide a context for the presentation and application of scientific ideas, as well as discussion about attitudes, ethics and values where these are relevant; the second uses mime and role-play to model abstract scientific concepts.

Communicating



microbiology through a drama-based strategy

arts and science community was always going to be challenging, drawing together different perspectives and backgrounds. Ultimately, the interaction and vision of the group made the drama a success, as the play works both as a piece of theatre while still managing to highlight some of the key scientific and ethical issues faced by infection control professionals and patients alike.

Stopping the Spread of Superbugs was brought to life on stage at Cheltenham Science Festival through the dialogue between two hospital cleaners. The story unfolds to reveal the fears and concerns experienced by one of the cleaners after her mother is re-admitted to hospital with an infection following routine surgery. A panel of 'infection control professionals' was on-hand to answer any questions that arose during the play. The audience was invited to put themselves in the shoes of the hospital decision-makers to answer some of the questions they face on a daily basis:

- Should all hospital patients be pre-screened for superbugs on admission?
- Should antibiotics be used as a precautionary measure?
- How do infections arise at all if strict protocols are followed?

The drama, which featured as one of the top 5 things to see at Cheltenham Science Festival, was a great success and we received positive feedback from the audience.

At the end there was a feeling of jubilation followed by *'What now!'* The play had been captured on film; we had the script and also a recorded Q and A session. The SGM had a fantastic resource – how could we maximize its potential?

We have gone down two separate avenues. The first is to have a Video Portal designed by the film company so that the recording of the play is be streamed via both our education website www.microbiologyonline.org.uk and the main SGM website www.sgm.ac.uk. This is accompanied by the Q and A session which addresses various issues around hospital-acquired infections. The script will also be made available to SGM members involved in outreach and SGM School Corporate members. This will allow students to take on the role of the key stakeholders in the case scenario, for example experts on the panel and also the two cleaners. The rest of the student group will make up the audience. Role-playing will allow the students

to prepare some of the information they plan to present, but will also force them to answer questions or discuss topics that they may not have anticipated.

The second approach was to reproduce the play at other suitable venues. Our first opportunity came hot on the heels of Cheltenham and we were able to stage the show at our Autumn Conference at the University of Nottingham. Council member, Kim Hardie, from Nottingham University very kindly recruited local experts for the panel. For continuity, Anthony Hilton, who had appeared at the original event, agreed once again to be the facilitator. We were also lucky enough to engage the same actors and theatre company.

Vicki Symington, our new Education and Outreach Administrator, gives her view on the second outing of *Stopping the Spread of Superbugs*.

"It really did match up fantastically with the A2 Edexcel scheme of work and I feel that the performance taught the topic and answered questions very well. Leaving little for me to do except to revise the topic later this year for revision. The two ladies who played the roles of the cleaners were great and it was fantastic to have real experts to field the questions."

Sarah Pike, Science Teacher, Lincoln Christ's Hospital School



Above. The panel of experts in Nottingham: Kim Hardie, Adam Roberts, Jacqueline Randle, Anthony Hilton (facilitator) and Roger Bayston. Right. The two actresses Marcia Mantack (left) and Kate Adams (centre) with their director Ellen Dowell. I. Atherton



STOPPING THE SPREAD OF SUPERBUGS IN NOTTINGHAM!

Just before I started work at SGM I was volunteering at Cheltenham Science Festival (June 2010). Cheltenham, as one of the UK's largest science festivals, exhibits microbiologists alongside intellectual property and technology experts, mathematicians alongside meteorologists and pharmacologists (amongst many others), and it showcases talks from top celebrity scientists to jobbing postdoctoral scientists and interested individuals. Cheltenham delivers science in new ways to the engaged and unengaged public. This year something novel caught my eye – a play... about superbugs? I must admit they had me there. I wanted to go, then lo and behold I see the organizer and sponsor of the event, my soon to be employer!

As a festival volunteer I ended up working the audiovisual (AV) set-up for this event. I was anxious from a technical perspective – as a volunteer AV assistant, that's normal – and anxious not to mess-up in front of SGM staff, but I was also excited to see what sort of events the SGM would deliver as inevitably these are the events I would be, and am now, involved with in my new job.

The play began and I was immediately drawn into the dialogue and the emotion of the situation. The acting was fantastic and the audience was engaged. At the end of Act One the play paused for Q&A to the scientists on stage. I was amazed at the audience's reaction, and from the questions posed to the scientists, it was clear that there were general misunderstandings of the basic science behind antibiotic resistance and so-called 'superbugs', but the public was interested in what the scientists had to say and were engaging with them. The event continued and by the end it genuinely felt like it had managed to inform and

deliver the information that the audience yearned for. The audience seemed impressed by the new method of science delivery – SGM were delighted with the response.

As a first outing for 'Superbugs' the event went very well; however, on reflection we decided that the event could be improved by altering the running order slightly (note: I say 'we', as



A section of the Nottingham audience. K. Rowlett

of the 21 June I came on-board as a member of the External Relations Department at SGM). One of my first jobs was to help design and advertise our public event at the SGM Autumn Conference in Nottingham; this was to be the second outing for the play. With the help of my colleagues I put the flier together and we distributed it to schools, colleges, universities, leisure centres, libraries, healthcare facilities, café scientifiques, theatres, cinemas and anywhere else we could think of in Nottingham and the surrounding areas. We aimed to ensure a web presence for the event on Facebook, Twitter and any Nottingham events pages we could find! All we could do was wait and see who turned up on the day!

As I was not running the event myself, I was to be on-hand to do the odd jobs that come up when putting an event on – mostly checking the equipment and making sure speakers and actors were where they were supposed to be in the lead up to the event! When 6.30 pm arrived on 8 September we were ready to go. The doors opened and more than 130 people filed into the lecture theatre; among the delegates from the conference were members of the public, university students, local healthcare workers and several school groups. Fantastic, we were thrilled at the turn-out! This time we had a different scientific panel who were able to bring their expertise to the melting pot. They all did a fantastic job answering questions from the relatively simple *what does MRSA stand for?* to *how long does MRSA persist on hospital reading materials?*, and down to the 'nitty-gritty' of virulence factors!

As the audience was a mix of abilities, I think that some were anxious to ask questions for fear of embarrassment; however, those brave enough to let their voices be heard could get the answers to their questions.

Once again, the response from the audience was positive and we have already had a request to repeat *Stopping The Spread of Superbugs* at Waterford Institute of Technology, Ireland.

SGM would like to take this opportunity to thank the microbiology experts **TONY BERENDT**, Executive Medical Director, Director of Infection Prevention and Control and Consultant Physician, Bone Infection Unit, Nuffield Orthopaedic Centre NHS Trust; **ANTHONY HILTON**, Reader in Microbiology, Aston University and **MARTIN KIERAN**, President of the Infection Prevention Society who helped to develop the case scenario, sat as experts on the panel and also came back to Cheltenham to film an additional section that hopefully answers frequently asked questions regarding hospital-acquired infections. SGM would also like to thank the director of Qualiathreatre, **ELLEN DOWELL**, her scriptwriter and actors who played the two cleaners.

We would also like to thank the panel of experts

that took part in the Nottingham production. **KIM HARDIE**, Associate Professor, Nottingham University; **ROGER BAYSTON**, Associate Professor & Reader in Surgical Infection, Faculty of Medicine & Health Sciences, Nottingham University; **JACQUELINE RANDLE**, Associate Professor, Nottingham University and **ADAM P. ROBERTS**, Lecturer in Molecular Microbiology, UCL Eastman Dental Institute.

DARIEL BURDASS is Head of Education, Professional Affairs and Outreach at SGM (email d.burdass@sgm.ac.uk)

VICKI SYMINGTON is Education and Outreach Administrator at SGM (email v.symington@sgm.ac.uk)

REFERENCES

www.ytouring.org.uk
Evaluation Associates (1997). *Cracked: A Study of Impact*.

From the structure of bacteria, viruses, fungi and protozoa to the development of medicines to treat infectious disease, all aspects of this topic are covered in a set of new resources from the Association of the British Pharmaceutical Industry on their website for schools, www.abpischools.org.uk

General information on pathogens, how they grow and cause disease is the subject of *Pathogens* (www.abpischools.org.uk/page/modules/infectiousdiseases_pathogens/index.cfm); Preventing the spread of infectious disease is covered from an historical angle in the *Timeline* (www.abpischools.org.uk/page/modules/infectiousdiseases_timeline/index.cfm); modern vaccinations in *Immunity* (www.abpischools.org.uk/page/modules/infectiousdiseases_immunity/index.cfm); and treatment of bacterial infection through use of antibiotics and the science behind antibiotic resistance are explored in *Medicines* (www.abpischools.org.uk/page/modules/infectiousdiseases_medicines/index.cfm). *Diseases* (www.abpischools.org.uk/page/modules/diseases/diseases1.cfm) covers the common infectious diseases listed in GCSE specifications.

New infectious disease web resources

Reviews

Empire of the Microbes:

Science Short Course

Authors C. Cockell & A. Brown

Publisher Open University (2010)

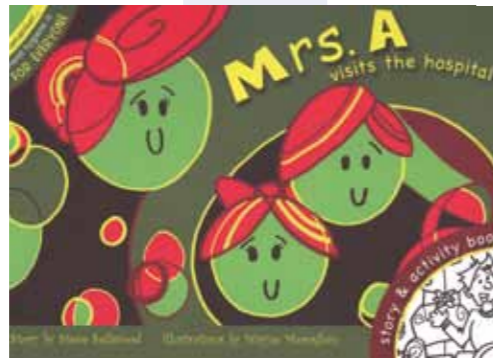
Details Part of OU course | pp. 239 | ISBN 978-1-84873-008-3

Reviewer Alan Cann, University of Leicester

Empire of the Microbes is an excellent introductory-level, general microbiology text, originally written to accompany the Open University course of the same name. The usual OU production values with full colour illustrations make this a visually attractive offering, something which is increasingly important in terms of student acceptance. In addition to the expected content, there is good coverage of the environmental aspects of microbiology, and some consideration of industrial microbiology as well. The self-assessment questions and activities in the text are a particularly useful feature. The accompanying DVD-ROM includes a few videos and a version of the OU Digital Microscope, although the Flash-based interface did not work with the current version of the Flash player on Macintosh OS X.

This book has a definite niche and would be very useful in schools where teachers have little background knowledge of microbiology, but its success will depend critically on price as the textbook market slowly contracts in the face of free online resources of ever-increasing quality.

This book is only available as part of the OU course: for further details, see www.open.ac.uk/yass



Mrs. A Visits the Hospital

Author S. Sellwood

Publisher NHS (2010)

Details £3.99 | pp. 28 | ISBN 978-0-95654-751-4

Reviewer Vicki Symington, SGM

In a bid to keep on top of in-house infections, the Royal Berkshire Hospital has produced this children's book to encourage hand washing from an early age by visitors to the hospital. The book has clear intentions, and the concept is really fantastic, though it occasionally falls short of the mark.

The story introduces Mrs. A, her daughter Staphylococcus (Staphy for short) and her son Aureus who live happily in the nose of Maureen. The book follows Aureus as he leaves the safety of Maureen's nose and travels on the hand of a boy called Calum onto different surfaces around the hospital, multiplying every time!

Full of quirky rhymes, activities and excellent illustrations, this book is very engaging and does get the hand washing concept across to the reader. However, it is very text heavy, some of the fonts used are difficult to read in places, and it is likely that the name Mrs. A will be lost on many readers both young and old. That said of course, it is nice to see hygiene messages being delivered in this way.

The Alimentary Pharmabiotic Centre (APC; <http://apc.ucc.ie>) is a University College Cork/ Teagasc Research Centre funded by Science Foundation Ireland and industry, focusing on gastrointestinal health and development of therapies for debilitating disorders such as Crohn's disease, colitis, irritable bowel syndrome (IBS) and food poisoning. One of the goals of the APC is to stimulate an interest in, and appreciation of, science in the general public, especially among primary and secondary level students and their teachers.

The APC is committed to keeping the public abreast of new therapeutic developments, ongoing clinical trials and exciting new research findings through its *Bringing Science to Society* programme. The APC has two websites (one for the public and one designed for children) which are updated regularly. Several times a year public and patient events take place with formal presentations followed by extensive question and answer sessions where the audience are actively encouraged to engage in discussion. Many of these events take place annually, e.g. the World Digestive Health Day.

MicrobeMagic@School is the APC's primary school

Coming soon: Cholera: Death by Diarrhoea

In a year where floods have hit Pakistan and cholera is rife, it is timely that the SGM release their latest factfile *Cholera: Death by Diarrhoea*. The factfile charts the history of the disease and investigates the cause, symptoms, diagnosis, treatment, and prevention of the disease as well as vaccine development and community education strategies. The resource is targeted at post-16 students and single copies will be available for free. Multiple copies can be supplied to SGM Corporate School members on request.

Alimentary Pharmabiotic Centre – Inspiring Tomorrow's Scientists

programme. Primary school teachers are supported through APC scientists visiting schools, providing interactive talks on topics such as the digestive system, the immune system, the heart and circulatory system and the five senses. Hands-on experiments are included and teachers are provided with packs which include background material and follow-up activities. To date we have visited more than 33,000 Irish primary school pupils. The APC's Microbe Magic website <http://microbemagic.ucc.ie/> is a wonderful resource for students, parents and for teachers. There are games to play, quizzes, experiments to do and your questions can be answered online by an APC scientist. Characters such as GI Jake, a bifidobacterium and Luke O'Cyte, a white blood cell, captivate children, and educational multimedia tools, including the computer games, *Gut Reaction* and *Gut Buster*, teach young people about the importance of bacteria in the gut. APC also hosts interactive stands at exhibitions, and has also provided workshops at Cork's *Lifetime Lab* and at the Royal Dublin Society through their Science Live Bursary scheme.

Budding Biologists is APC's Secondary School Programme. It provides students with the opportunity to conduct

'hands-on' experiments in university laboratories and hosts an annual Transition Year Experience programme, which encourages students aged ~16 years, to study science subjects for the Leaving Certificate and subsequently at third level. The programme offers students a unique insight into the multidisciplinary nature of research at UCC, providing them with an action-packed programme of laboratory-based and other activities, including workshops on careers, presentation skills, report writing, demonstrations of UCC's state-of-the-art equipment and tours of the facilities and campus.

Science Raps Challenge is a competition organized by the APC which aims to encourage young people to express their thoughts about science and technology through rap music. The inaugural competition in 2009, in which the APC invited science rapper Jonathan Chase to challenge kids to submit raps on the theme of *Celebrating Creativity and Innovation*, had some great entries, and some of these can be viewed on YouTube's pharmabiotic channel. 'The school vibrated with science during the competition. Students and staff who never associated fun and music with science enjoyed performances by a mixture of 2nd and 5th year students. The students themselves



SGM CALENDAR

SGM is launching a calendar for 2011 which will be available to school members and parliamentarians. The calendar, which will feature beautiful microbiological images alongside notable dates in the microbiology calendar, will be distributed by the end of December 2010.

enthused about the subject as they bonded while trying to put science facts into rap. Science teachers are considering putting all their classes into rap, such was the positive response! said Rosemary Ferriter, a teacher from St Vincent's Secondary School in Cork. The theme for this year's competition is 'Our place in space' – full details are available on the APC website.

The APC is also a partner in *Debating Science Issues*, a national inter-school debating competition, funded by the Wellcome Trust, with other research centres in Ireland. The ethical implications of current biomedical issues from GM food to stem cells, from vaccination to nanotechnology are all debated throughout Ireland in a competition.

CATHERINE BUCKLEY is the Education and Outreach Manager, APC, BioSciences Institute, University College Cork, Ireland (tel. 353 21 4903362; email c.buckley@ucc.ie)



PUBLIC LECTURE

“How do microorganisms cause the disease”

Professor Maja Rupnik

Hisa eksperimentov/Science centre, Ljubljana, Slovenia

20th January 2011

<http://www.he.si>

Video available at <http://vimeo.com/21053709>.

Maja Rupnik: Kako mikroorganizmi povzročajo bolezni? on Vimeo - Windows Internet Explorer

<http://vimeo.com/21053709>

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Maja Rupnik: Kako mikroorganizmi povzročajo bolezni?...

Maja Rupnik: Kako mikroorganizmi povzročajo bolezni?

by Hiša eksperimentov
9 months ago

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Mikrob in gostitelj

hrana

37:18 HD

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2. Romana Marinšek Logar: Kako izkoristiti mikroorgan...
1. Maja Rupnik: Kako mikroorganizmi povzročajo bolezni?

start Microsoft Excel - Tabl... Maja Rupnik: Kako mi... Search Desktop 10:13

PUBLIC LECTURE

“*Clostridium difficile* in Italy”

Dr Paola Mastrantonio

6th ClostPath, Rome, Italy

23rd October 2009

<http://www.clostridia.net/rome/index.html>

Clostridia | Clostridium | Nigel Minton - Windows Internet Explorer

http://www.clostridia.net/rome/index.html

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Clostridia: The Impact of Genomics on Disease Control

6th ClostPath International Conference

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THE CONFERENCE

19-23 October 2009
Istituto Superiore di Sanità, Rome, Italy

Hosted by Paola Mastrantonio

For the past 14 years, the ClostPath International Conferences have been a venue for the presentation and discussion of the latest scientific news of the genus *Clostridium* and are now the leading forum for the international community to meet and discuss progress made in understanding the pathogenic clostridia and their associated diseases. Thanks to the Marie Curie Action Project and to the ESCMID sponsorship it will be possible to give young researchers the opportunity to present their work also at this Conference in Rome. It is therefore a great pleasure to welcome you to the 6th ClostPath International Conference in Rome and we look forward to seeing you all in such a unique historical setting.

The Organising Committee

Download [ABSTRACT BOOK](#)

ESCMID EUROPEAN SOCIETY OF CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES

Internet 100%

start Clostridia | Clostridiu... Search Desktop 10:32



Clostridia: The Impact of Genomics on Disease Control

6th ClostPath International Conference



Clostridia: The Impact of Genomics on Disease Control

Local Organizer Secretariat
PTS S.r.l.
Via Nizza, 45 — 00198 Roma
Tel. 06 85355590
Fax 06 85356060
e-mail: Maura.Stella@ptsroma.it

Rome, 19 - 23 October 2009

Clostridia:
The Impact of Genomics
on Disease Control

6th ClostPath International Conference

Rome, 19 – 23 October 2009

Istituto Superiore di Sanità
Hall Pocchiari

Friday 23rd October 2009

Special Public Session

Chairpersons: *P. Mastrantonio, N. Minton*

- 09:30 - 10:15 Clostridium Infections: Afflictions For All Seasons
Sherwood Gorbach – Tufts University School of Medicine,
Boston, USA
- 10:15 - 10:30 Training the next generation of European Clostridium
Researchers
Nigel Minton – Nottingham University, UK
- 10:30 - 11:00 Coffee Break
- 11:00 - 11:20 *Clostridium botulinum* in Italy
Paolo Aureli - Istituto Superiore di Sanità, Italy
- 11:20 -11:40 *Clostridium difficile* in Italy
Paola Mastrantonio - Istituto Superiore di Sanità, Italy
- 11:40 - 12:00 Questions & Answers

LETTER OF ACCEPTANCE FROM ONE INVITED HIGH SCHOOL



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All'Istituto Superiore di Sanità
Dipartimento di Malattie Infettive, Parassitarie ed Immunitarie
Dott.ssa Paola Mastrantonio
Viale Regina Elena 299
00161 Roma

OGGETTO: Congresso sui "Clostridi patogeni per l'uomo".

Si comunica la conferma alla partecipazione del Congresso sui "Clostridi patogeni per l'uomo" della classe quarta A chimico biologico più due alunni della classe terza B chimico biologico per un totale di 27 alunni più due accompagnatori.

Si ringrazia per il gentile invito

Il Dirigente scolastico
(Prof. Massimo Felli)

Roma, 21/10/2009



ISS : Ufficio Stampa : Primo Piano : Infezioni batteriche: all'ISS un convegno sui clos...



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Infezioni batteriche: all'ISS un convegno sui clostridi patogeni per l'uomo

ISS 19/10/09

Si svolge all'Istituto Superiore di Sanità il sesto Convegno internazionale dedicato ai clostridi, batteri ubiquitari, presenti sia nell'ambiente che nella normale flora batterica umana e animale, all'origine spesso di pericolose infezioni.

Il Convegno scaturisce dal progetto CLOSTRIDIA, finanziato dal **Marie Curie Actions**, di cui l'Istituto Superiore di Sanità (ISS) è uno dei 7 partners scientifici. Nell'arco di 4 anni, il progetto ha permesso la partecipazione a corsi teorico-pratici e a congressi semestrali di questo tipo, a 100 dottorandi o post-doc e a vari ricercatori europei. Proprio l'ISS conclude quest'anno le attività di tutto il progetto con una Conferenza internazionale dal titolo *Clostridia: The Impact of Genomics on Disease Control*, alla quale partecipano 220 delegati internazionali, tra cui i più noti esperti a livello mondiale e 75 giovani ricercatori finanziati anche per questo ultimo evento formativo dal Marie Curie Actions.

Cosa sono i Clostridi

I *Clostridi* sono batteri anaerobi, sporigeni. La produzione di spore permette loro di resistere nell'ambiente esterno anche per un lungo periodo finché non incontrano condizioni adatte allo sviluppo della forma vegetativa che ne permette la moltiplicazione. I clostridi sono ubiquitari e quindi presenti sia nell'ambiente che nella normale flora batterica del tratto gastrointestinale degli animali e dell'uomo.

I più comuni

Alcune specie sono patogene per la produzione di potenti tossine, tra questi i più importanti e temibili sono: *Clostridium tetani*, *Clostridium botulinum*, *Clostridium perfringens* e *Clostridium difficile*.

Clostridium tetani è l'agente eziologico del tetano. L'infezione si manifesta quando il batterio riesce a penetrare nelle ferite, a germinare e a produrre una neurotossina che determina la simultanea contrazione dei muscoli agonisti ed antagonisti, e quindi la paralisi, che può essere mortale in caso di interessamento dei muscoli respiratori. Nei paesi sottosviluppati il tetano è la prima causa di morte nel primo anno di vita ("classica" morte al 7° giorno); il tetano neonatale è, infatti, causato dal taglio del cordone ombelicale con un arnese contaminato, oppure dalla cicatrizzazione con sterco di

animale, praticata sovente in Africa. **La prevenzione** si attua attraverso la somministrazione di un efficace vaccino da molto tempo in uso nei nostri Paesi sviluppati economicamente. In Italia il calendario vaccinale vigente prevede la somministrazione di tre dosi al terzo, quinto e dodicesimo mese di età. Una dose di richiamo (associata con le componenti contro la difterite e la pertosse) viene eseguita nel sesto anno e un'altra a 14 anni. La somministrazione di tre dosi di vaccinazione antitetanica conferisce una protezione molto elevata, con un'efficacia superiore al 95%. La durata della protezione nel tempo è di almeno 10 anni ed è ulteriormente garantita dall'esecuzione di ulteriori richiami in età adulta.

Clostridium botulinum è l'agente di una grave intossicazione alimentare. La tossina botulinica, termolabile a 80° C e resistente ai succhi gastrici, è estremamente attiva ed è uno dei veleni più potenti che siano noti all'uomo: bastano pochi nanogrammi di tossina per causare la malattia e la morte. Il botulismo costituisce un grande problema per la sicurezza alimentare: esiste, infatti, il rischio che il cibo contaminato, sia di preparazione domestica che industriale, possa venire consumato da molte persone. Il botulismo alimentare può colpire individui di tutte le età e non è trasmissibile da persona a persona. I sintomi solitamente si manifestano molto rapidamente, da poche ore a pochi giorni dall'ingestione della tossina (6 ore - 15 giorni), e sono quelli tipici di una paralisi neurale. A seconda della dose di tossina ingerita, le manifestazioni cliniche variano da una sintomatologia sfumata a casi molto severi che possono concludersi anche con un esito fatale (circa il 5%). Il trattamento della tossina botulinica è possibile solo con la somministrazione di un'antitossina nelle prime ore dalla comparsa dei sintomi e il recupero è molto lento. In Italia l'antitossina botulinica è disponibile presso il Ministero della Salute. *C. botulinum* può essere presente in cibi inscatolati o conservati, soprattutto di produzione domestica ma anche, in qualche caso, industriale. In generale, tutti i cibi conservati che non vengono fatti cuocere e che hanno un basso grado di acidità (pH sopra il 4,6), possono costituire un ambiente adatto alla crescita del batterio. Le tossine botuliniche sono anche considerate una potenziale arma di bioterrorismo, in quanto i cibi possono venire deliberatamente contaminati. Per questo la ricerca e la sorveglianza sul botulino sono considerate prioritarie nei programmi di biosicurezza. Esistono anche altre forme di botulismo: il botulismo infantile, causato dalla presenza di *C. botulinum* nel tratto intestinale di un certo numero di neonati, e il botulismo da ferita o lesione, dovuto all'infezione di ferite da parte del batterio. **Non esiste prevenzione vaccinale.**

Clostridium perfringens produce pericolose tossine sia per l'uomo che per gli animali. Il tipo A è la principale causa delle intossicazioni alimentari nell'uomo. La tossinfezione alimentare da *C. perfringens* avviene per ingestione di cibo contaminato da terriccio o da feci e conservato, poi, in condizioni che permettano la moltiplicazione del microrganismo. Praticamente tutte le epidemie sono associate al consumo di carni cotte in maniera inadeguata e poi riscaldate. Le spore sopravvivono alle normali temperature di cottura, germinano e si moltiplicano durante il processo di raffreddamento lento, se mantenute a temperatura ambiente o se riscaldate a temperature non efficaci per inattivarle. Il verificarsi di epidemie è attribuito in genere all'inadeguata cottura e refrigerazione in impianti di cucina su larga scala, in ristoranti, mense, bar e scuole. Il periodo di incubazione varia da 8 a 22 ore dall'ingestione del cibo contaminato ed i sintomi consistono in diarrea e dolori addominali, con un decorso generalmente rapido (1-2 giorni) e benigno. **La più importante misura preventiva** consiste nell'educazione sanitaria del personale adibito alla preparazione dei cibi sui rischi legati alla cottura di grandi quantità di cibi. È in generale importante evitare di effettuare cotture parziali di carni e pollami per poi procedere al loro riscaldamento in un giorno successivo ameno di non poterli conservare a temperature sicure.

Clostridium difficile è la principale causa di diarrea in ambito ospedaliero. I fattori di

rischio per questa malattia sono associati ad un prolungato uso di antibiotici, età avanzata (sopra i 65 anni), interventi chirurgici gastrointestinali, immunodepressione. *C. difficile* si può trasmettere direttamente da paziente a paziente o indirettamente, tramite il personale ospedaliero e/o l'ambiente. I principali fattori di virulenza di *C. difficile* sono due tossine, un'enterotossina (A) e una citotossina (B). Le infezioni da *C. difficile* presentano diversi gradi di severità: da lievi diarree autolimitanti fino alla grave, a volte mortale, colite pseudo-membranosa. Questa patologia si manifesta con nausea, vomito, diarrea muco-ematica, dolori addominali, febbre, leucocitosi, disidratazione. Il quadro endoscopico è rappresentato da un'iperemia della mucosa, cioè un'inflammazione, con ulcerazioni e sanguinamento e tipiche pseudo-membrane biancastre la cui asportazione lascia la mucosa erosa e sanguinante. La terapia comprende la sospensione dell'antibiotico che ha determinato l'insorgere dell'infezione e la somministrazione di farmaci diretti in maniera più mirata contro *C. difficile* (metronidazolo e vancomicina). Dal 2001 si è registrato in tutto il mondo un aumento delle infezioni e delle epidemie da *C. difficile*, con centinaia di decessi. Le ragioni sono principalmente quattro: l'aumento dell'età della popolazione e perciò del numero di persone a rischio, l'emergenza di ceppi iper-virulenti, l'aumento dell'uso degli antibiotici che modificano la normale microflora intestinale, i bassi livelli di igiene e l'affollamento negli ospedali. **La prevenzione** delle malattie da *C. difficile* consiste nella prudente somministrazione degli antibiotici ad ampio spettro, nell'isolamento dei pazienti infetti in camere singole con bagno, nel controllo dell'igiene del personale ospedaliero (lavaggio frequente delle mani con sapone, uso di guanti e camici) e dell'ambiente negli ospedali con ipoclorito di sodio.

Cosa è Marie Curie Actions

Marie Curie Actions - Human Resources and Mobility è un programma della Comunità Europea educativo che prevede attraverso finanziamenti ad hoc di: • far crescere la ricerca europea su specifiche tematiche rispetto all'avanguardia internazionale • stabilire sinergie a lungo termine fra ricercatori europei • incoraggiare giovani scienziati ad iniziare attività specifiche • aumentare la mobilità ed incrementare le opportunità di lavoro nel campo scientifico

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Aiutaci

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