

ILLUMIN

The newsletter for microscope users

Welcome

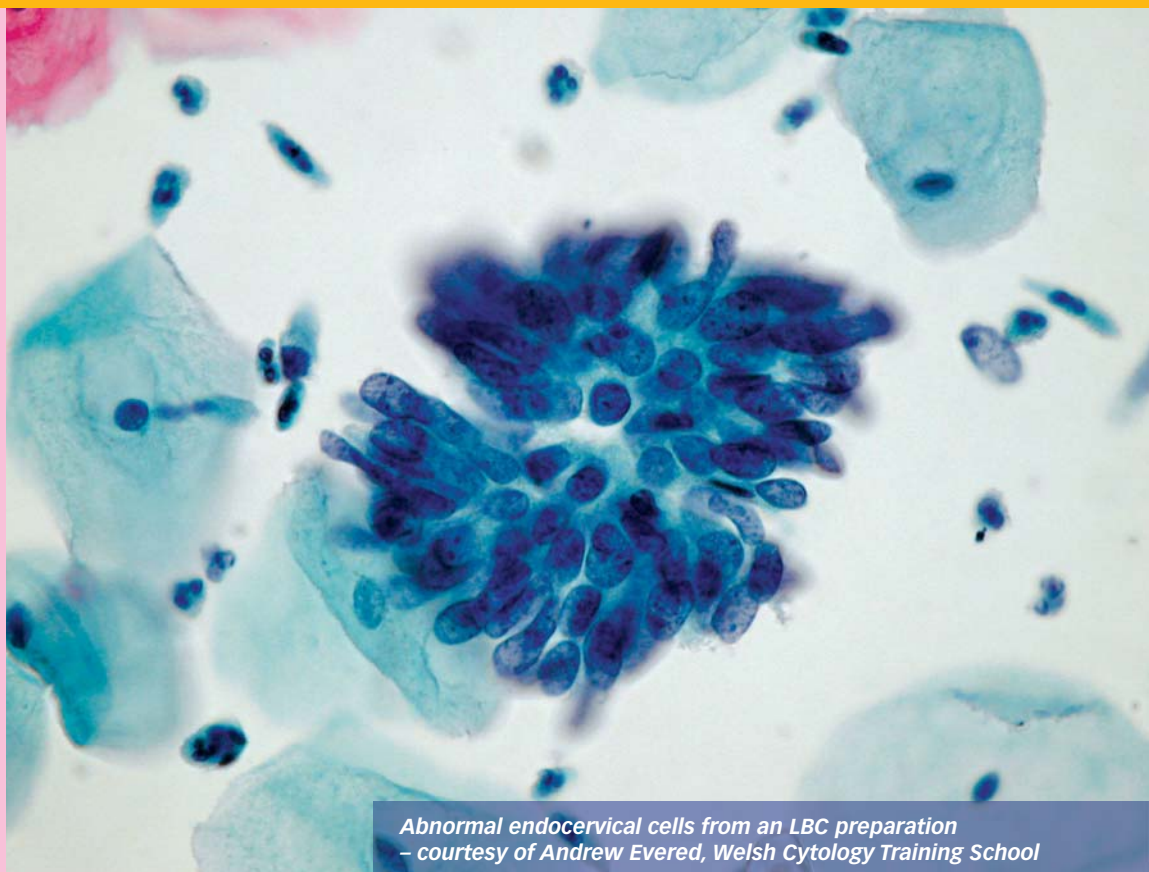
to the new newsletter from Olympus UK. This takes over from our previous publication – Objectives – and will be published bi-monthly. It is aimed at people, like yourself, using microscopes on a day to day basis, giving you a stage on which to present various aspects of your work. We welcome your letters and short articles and will combine these with news and views from key opinion leaders and technical experts.

We hope you enjoy this newsletter and pass it between your colleagues. If you would like to receive future issues please fill in the reply paid card or email microscope@olympus.uk.com – and don't miss our competition to win a new Olympus camera.



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Abnormal endocervical cells from an LBC preparation – courtesy of Andrew Evered, Welsh Cytology Training School

LBC - a clearer picture

Are the present microscope optics suitable for liquid based cytology?

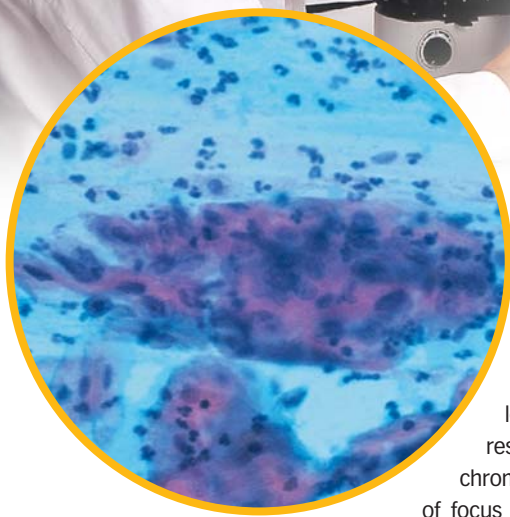
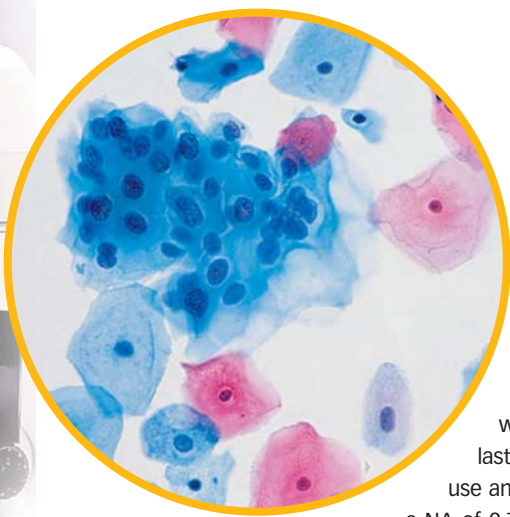
Liquid based cytology (LBC) is being heralded as the way forward in cervical screening and will mean an improved and more efficient workflow with a reduced load for cytology laboratories.

The new methodology also causes very little disruption to the protocol used by the smear practitioner and is a more accurate way of ensuring a representative sample of cells. Moreover, patients will feel the benefit of significantly fewer re-tests, greatly reducing anxiety and worry for thousands of women. With no final agreement from NICE¹ on the preferred system for LBC, or any clear advantage shown of one system over the others from the NCCHTA², implementation will differ between Trusts. The systems available include manual and automated protocols and consequently vary in cost. So the methodology employed at a local level will be dependent on the number of samples to

be processed and the subsequent requirements for automation. Whether or not the use of these different systems will produce quality assurance issues for the national screening programme is yet to be seen, but the multi-site studies conducted thus far have not indicated any sizeable problems.

Making the most of LBC

Estimates have suggested that the implementation of LBC will generate overall cost savings compared to conventional cytology. Some people have commented that these savings should be ploughed back into the cytology departments for new equipment purchases. New health and safety guidelines recently led to the introduction of microscopes with improved ergonomic design for cervical screening laboratories. Now, with the introduction of LBC it is essential that the optical components of the microscopes are upgraded to maximise the benefit of the improved preparation methodology. After all, the actual



Above Left:
A 'classical' smear slide

Above right:
A Liquid Based Cytology slide

Both courtesy of
Cytoc UK Limited

NICE = National Institute for
Clinical Excellence
NCCHTA = National Coordinating
Centre for Health Technology
Assessment

detection is performed by cytologists and the method used to produce the slide samples will have a diminished impact if the microscopes are not capable of the resolution required.

The objectives most commonly used for conventional cytology are basic plan Achromatic 10x and 40x lenses, which are capable of moderate resolutions and limited correction for chromatic aberrations but have a good depth of focus – useful in thicker samples. The basic principle of LBC though is to provide a monolayer of cells with improved sub-cellular detail. Dr Turnbull, QA Director for the North West said “LBC provides amazing nuclear detail, but this benefit may be lost to some extent if viewed through basic plan achromatic objectives”. To maximise the benefit of LBC therefore, the microscope objectives used need to be as good as possible. “In conventional smears, dyskaryotic cells often appear in streaks making them stand out slightly from other cells. In LBC these streaks do not exist and therefore a baseline needs to be defined for each case” commented Dr Turnbull. She continued “The need for more careful observation may seem at first to be a hindrance to laboratory throughput, but with ongoing training and better optics cytologists will be able to provide a much better assessment of the grade of any dyskaryotic cells than ever before.” Improved optics will also reduce eye fatigue thus improving a screener’s productivity.

identify the structures and shapes of the cell and its contents. According to Dr Turnbull “Using achromatic objectives really negates some of the benefits provided by LBC and could prove the difference between a clear dyskaryosis and a borderline result”. She concluded “I have been working with plan apochromats for the last few years and find that I rarely need to use anything other than a 20x objective with a NA of 0.70 – this provides the clarity and field of view to quickly and correctly screen LBC slides”. Andrew Evered, General Secretary of the NAC and Manager of the Welsh Cytology Training School agreed, saying “better optics will enhance the throughput of LBC screening due to the clarity provided” Andrew prefers using a 10x Plan Apochromatic objective for screening.

Is it worth upgrading objectives with HPV vaccination on the horizon?

The Human Papillomavirus (HPV) has been linked to the great majority of cervical cancers and it is logical to suggest that with the success of other vaccination programmes, inoculation against this virus will reduce the number of cervical cancer cases dramatically. Clinical trials have shown this to be a well founded point and a number of vaccines are now close to full acceptance. In her excellent overview of the issues surrounding HPV vaccination³ though, Margaret Stanley mentions that despite the potential of inoculations there were many points that could prevent it from replacing cytological screening programmes. Not least of these were the social and cultural issues of vaccinating 9-10 year olds against an essentially sexually transmitted disease they may get many years later.

More importantly though, even if 100% of 9-10 year olds are vaccinated, the vaccines in development will only cover about 80% of the known cancer causing strains of HPV, leaving a significant number of people unprotected. This would mean that cytologists will notice a reduction in the rate of CIN and dyskaryotic cells and will therefore need to be more vigilant than ever – another reason to ensure top-class optics. To improve this immunisation percentage would require the inclusion of more than five strains within one vaccine, which will need approximately another 20 years of trials and even then there is a need to maintain cytological screening. Where the vaccination programme will end up is unknown, but it is certain that cytology, especially with the introduction of LBC and better optics, is a requirement for the foreseeable future.

Do you want to see the difference?

Contact Olympus and we will show you our new UIS2 plan apochromatic objectives.

microscope@olympus.uk.com

“Using plan achromatic objectives really negates some of the benefits provided by LBC”

References:

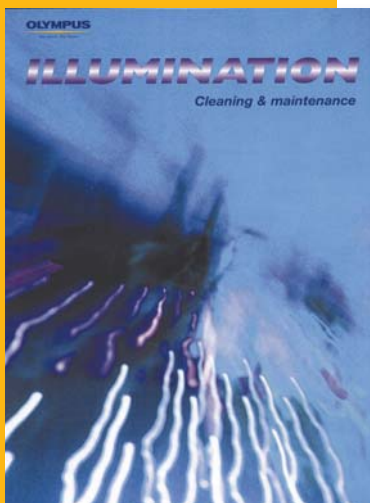
- 1: National Institute for Clinical Excellence. Guidance on the use of liquid-based cytology for cervical screening. *Technology Assessment* 69. 2003
- 2: Payne N, Chilcott J, McGoogan E. Liquid-based cytology in cervical screening: a rapid and systematic review. *Health Technol. Assess.* 2000; 4(18).
- 3: Stanley, M. J. *Fam. Plann. Reprod. Health Care.* 2004 30(4):213-5

To achieve the clarity required, colour and spherical aberrations need to be as fully corrected as possible and the numerical aperture needs to be high – this is only truly possible using Plan Apochromatic lenses. These lenses correct for the division of the light into it’s component colours and field curvature producing very clear images with flatness throughout the field of view. Moreover, they provide a smaller depth of focus, allowing various focal planes through a cell – this again improves the clarity and allows the cytologist to better

Light up your microscopes with 'Illuminations'

Olympus knows that little things can make a big difference and we are producing a range of short 'How to' notes on topics of interest to microscope users. So far the series has covered Koehler Illumination, Cleaning & Maintenance, Mercury Burners, Phase Contrast and Nomarski DIC. To receive these free leaflets, fill in and return the reply paid slip attached to this issue of Illumin8 or email

microscope@olympus.uk.com



The 'Illuminations' leaflets cover a wide range of important 'How to' topics

Flexibility from the first to the last

Olympus designs all of its products with the same attention to detail, which means that the CX31 and CX41 entry level microscopes and the top of the range FluoView 1000 confocal are designed using the same basic principles. So the quality and flexibility you rely on with your research microscope is available for your students and routine applications.



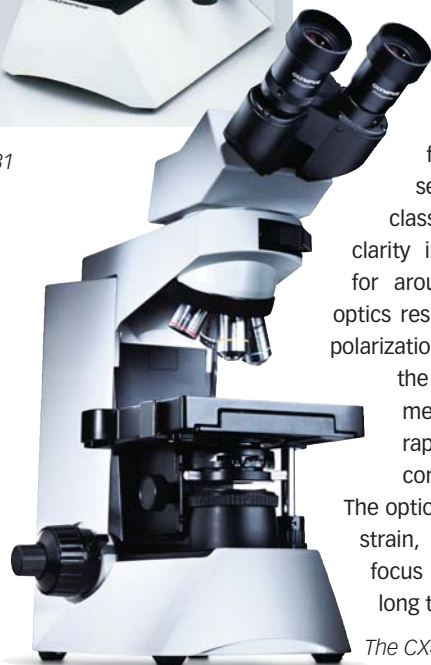
The CX31

CX31 for teaching and routine applications

The CX31 is a fixed specification binocular microscope for teaching and routine applications such as checking staining routines. It offers a rigid and durable construction with high performance and a long life. The optics provide bright, even and flat images rare in a microscope under £1200. All main controls of the CX31 are located close together providing a compact and ergonomic design allowing the user to operate the microscope with minimal movements.

CX41 for routine applications

The cost-efficient CX41 is suitable for routine brightfield, phase contrast and reflected light fluorescence applications. This best-selling micro-scope sets the pace in its class for versatility and provides high image clarity in a variety of observation methods for around £2000. The world leading UIS2 optics result in outstanding images with simple polarization, phase contrast or darkfield, without the need to change objectives between methods. This allows a sample to be rapidly found and focused using phase contrast before switching to fluorescence. The optional tilting binocular tube reduces neck strain, and low positioning of stage handle, focus knob, and frontal light control make long term use extremely comfortable.



The CX41

NAC 2005: A feast for all

This year's NAC conference in York has been hailed the best ever and has thrown down the gauntlet to the next one. Various comments on the NAC website forum suggest that a good time was had by all - sometimes to excess! On a more serious side the conference addressed such issues as: 'Colposcopy, Cytology and Infection: Up a Gum Tree!' 'SurePath vs. ThinPrep Technology: Chalk and Cheese?'; 'LBC in non Gynae cytology'; and 'The Psychosocial impact of HPV testing'. Also at this year's NAC, a training workshop using microscopes provided by Olympus, proved that even the most experienced cytologists can pick up new skills.



Present Chairman of the NAC - Mike Rowell - was thankful to all those who attended the meeting, saying "I have only received positive comments about the balanced programme and social events and thought the whole thing was a great success." Mr Rowell continued "The committee was particularly grateful to Olympus for their sponsorship of the event and in particular to Alan Lasslett who not only provided the microscopes for use in the Quiz, but also was on hand throughout the conference to demonstrate the correct use of light microscopes". The event culminated in the ABBA evening at which a whole host of blonde wigs and flared trousers were seen strutting on the dance floor.

A digital **revolution**

Everything in life seems to be turning digital: TVs, radios, telephones, even microscopy. Olympus has a range of digital cameras to cover the needs of even entry level microscopes. So if you are still using 35mm film and want to take the plunge into the digital era, the CVIIIu (ColorView III uncooled) will ease you in. It is the non-cooled version of the ColorView III boasting 5 Mega Pixel resolution with a generous dynamic range, fast frame rates, and colour binning. Images taken by the CVIIIu will convince you that the excellent fidelity and superior contrast of digital cameras make the swap worthwhile.

Contact Olympus to arrange a trial in your lab.
microscope@olympus.com



The ColorView III uncooled digital camera

Looking Back

Nowadays the most advanced microscopes have become very complex instruments, capable of far more than just providing a closer view of objects. But how did it all begin? When and where were the principles that govern microscopes discovered and developed? In the next issue of Illumin8 we start with the first mention of lenses as "burning glasses" or "magnifying glasses" as per the writings of the Roman philosophers Seneca and Pliny the Elder during the first century A.D!

Can you afford to miss this enthralling look into history?

Find out more by returning the reply paid card and receive every issue of Illumin8.

Title & Name _____

Dept. _____

Institute/Hospital _____

Address _____

Telephone _____

Email _____

My Answers to the competition are:

(1) _____ (2) _____ (3) _____

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Mercury Burners Phase Contrast Nomarski DIC

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The writing is on the wall

We all know that the range of objectives available is sometimes confusing to even the most regular microscope users.

Olympus has produced a poster to help you select the correct objective everytime. This poster is aimed at upright brightfield microscope users (ie anyone who views stained specimens), such as cytologists and contains all you need to know about Olympus' advanced UIS2 objectives.

To receive a poster you can email us on

microscope@olympus.uk.com

or fill-in and return the reply paid card attached to this newsletter.

Run for your life, **it's the Hairy Haggis**



On June 12th 11,000 people raised over £1.5m by covering the blister-inducing distance of 26.2 miles. Amongst these intrepid folk running the Edinburgh marathon were ten runners from the University of Edinburgh raising money for a new Medical Cell Biology Research Institute. They competed in two relay teams within the Hairy Haggis Relay Challenge section, which means that each runner covered approximately seven miles. "The money raised by the two teams will go towards a new building for research into the most prevalent human diseases" commented Professor Savill, Head of the College of Medicine and Veterinary Medicine.

The total cost of the development will be about £49m, £48m of which has already been pledged. The teams have been given an extra incentive to run since \$1m of this was offered by the Kresge Foundation "...on the condition that we raised the remaining funds by October 2005" continued Professor Savill. The University Haggis runners finished in around 4 hours and with the help of Olympus have raised well in excess of £1500.

Picture yourself with a nice new camera

Olympus always provide you with a great instrument to produce perfect results. The same is true of our camera range and in this issue we are giving you the opportunity to win the new compact μ [mju:] mini-DIGITAL 4.0 mega pixel digital camera in a choice of colours. The super-smooth streamlined aluminium body and all-weather design makes the μ [mju:] mini-DIGITAL a must-have! To be in with a chance of winning the camera you will need to answer three questions on the attached reply paid card and post it to us before the 30 July 2005. It is easy, the answers are in the newsletter!



The stylish new μ [mju:] mini DIGITAL 4.0 mega pixel digital camera

Question 1:

How many mega pixels does the CV880 digital microscope camera feature?

Question 2:

Which type of objectives provide the best colour correction?

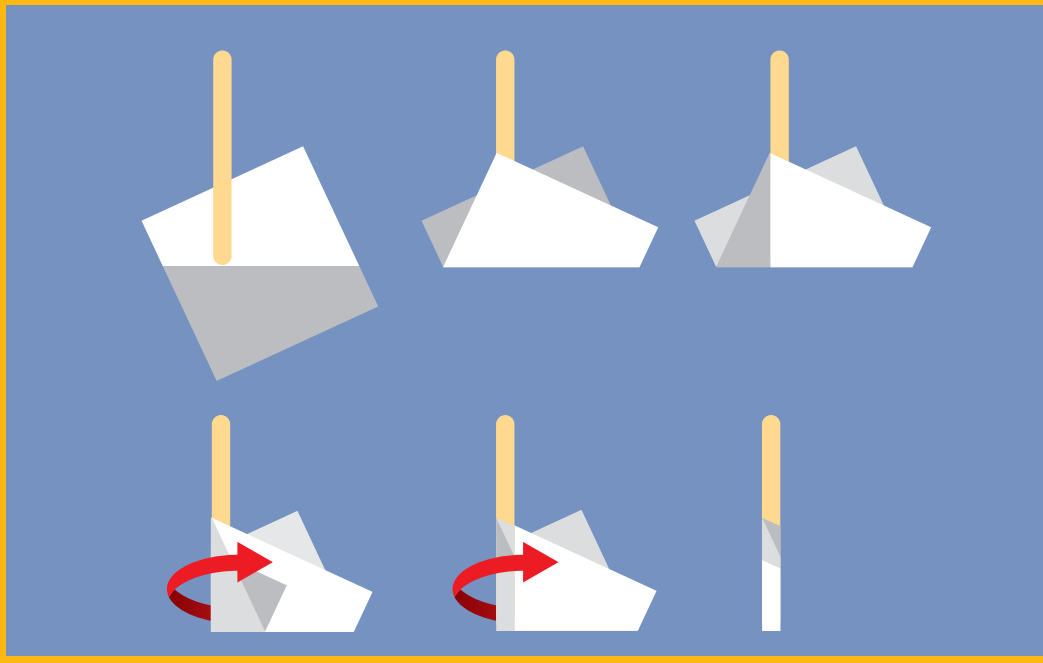
Question 3:

Which entry level Olympus microscope is also suitable for fluorescence?

SHORT TIPS FOR BETTER PICS

Origami or lens cleaning?

Keeping objectives, eyepieces and filters clean can significantly enhance your image quality. Make sure though you use the correct tissues and cloths and only clean the exposed surfaces. Olympus think cleaning is very important and one of our 'Illuminations' leaflets concerns just this – ask for your Illuminations leaflets on the attached reply paid card



ILLUMINATIONS

OLYMPUS

Your Vision, Our Future

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