TRAJAN

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Specialized microscope slides offer excellent specimen adhesion and morphology for bone marrow trephine biopsy sections

Trajan Series 3 adhesive microscope slides

Challenge

Bone marrow trephine (BMT) biopsy sections lifting off the surface of microscope slides during processing, resulting in specimen loss.

Solution

Product	Trajan Series 3 adhesive microscope slides
Sample	Bone marrow trephine biopsy
Stains	H&E, Giemsa, reticulin silver and requisite IHC stains.
Quality accreditation	Product validated under laboratory's ISO 15189 compliance.
Site	New Cross Hospital, Royal Wolverhampton NHS Trust, UK.

Introduction

Bone marrow trephine (BMT) biopsy is carried out as part of assessment of various hematological conditions to evaluate marrow cellularity, cell distribution and morphology. The bone marrow sample required is usually taken from the patient's hip bone using a trephine needle.

Taking into account complexity of the trephine biopsy procedure and patient discomfort, the small volume sample (~1.5-2 cm length) becomes highly valuable in supporting patient diagnosis.

Following fixation and decalcification, blocks are cut and thin (~1-2 µm) specimen sections (see fig. 1) are mounted on microscope slides for H&E (see fig. 2) and reticulin silver stains. Giemsa stain is also used in laboratories as it provides specific information around cellular morphology. Immuno-histochemical stains are then applied selectively based on the H&E and Retic appearance and clinical findings.

"Since the adoption of Series 3 adhesive microscope slides from Trajan Scientific and Medical, we have used them in more than 235 bone marrow trephine biopsy cases which demonstrated outstanding results with regards to stain quality, as well as minimum repeat rates due to tissue loss."

- Glyn Woodward, Quality Lead, New Cross Hospital

Summary

Trajan Series 3 adhesive microscope slides assist investigation of BMT biopsy samples with an aim to support diagnosis and management of hematological conditions.

The slides provide excellent specimen adhesion and the mounted sections can be used for an array of routine and IHC stains.

With minimal failure and repeat rates, the slides provide fast turnaround time as results for H&E and other IHC stains being available within 48-72 hours of carrying out the biopsy depending on the applied protocol.

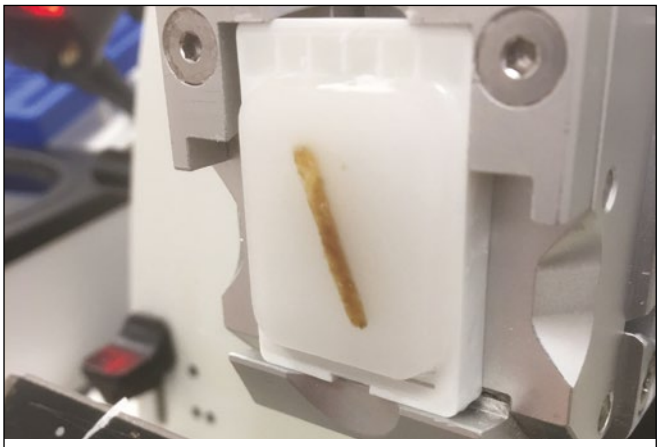

Figure 1. Sectioning ~1-2 µm thin bone marrow trephine (BMT) specimens using microtome.

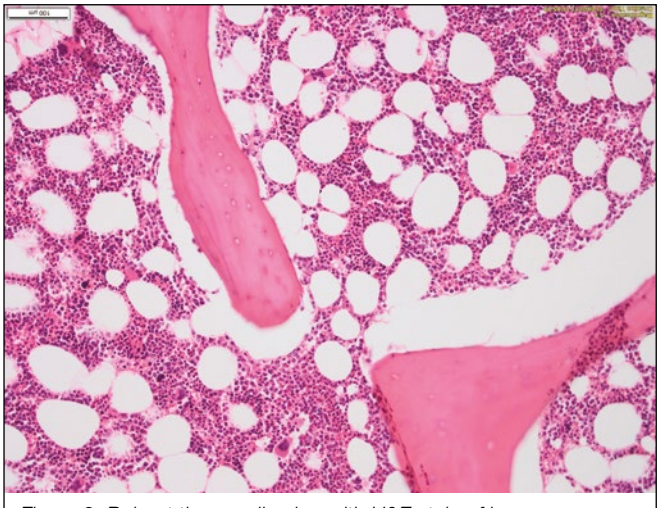

Figure 2. Robust tissue adhesion with H&E stain of bone marrow trephine (BMT) biopsy section on Trajan Series 3 adhesive microscope slide.

RWT Pathology Services

The Royal Wolverhampton NHS Trust (RWT) New Cross Hospital Pathology Services provide a wide range of laboratory examinations including scientific and clinical advisory services to aid the diagnosis of illnesses and monitoring of treatments.

They have an experienced team of pathology consultants, clinical, and scientific staff to ensure patients are provided accurate results.

To ensure the highest quality of service, they participate in the relevant external quality assurance schemes. Rigorous internal quality control checks are regularly made, particularly on special stain preparations.

RWT perform more than 245,000 H&Es per year and other special stains using the most up to date approved methods.

Their commitment lies in delivering improvements in patient care and overall performance while maintaining quality systems.

Background

Glyn Woodward, Quality Lead at RWT's New Cross Hospital, has been working in histopathology for more than 40 years, and is familiar with the challenges associated with processing BMT biopsy specimens.

Glyn recalls that the only adhesives available when he first started were glycerine-albumin and poly-L-lysine.

He recalls how the introduction of charged slides helped reduce the loss of tissue sections during immunohistochemistry (IHC) and regards the Trajan Series 3 adhesive microscope slides offering an increase in quality over traditional charged slides, particularly for BMT specimens.

An ongoing challenge for New Cross Hospital has been a higher than normal test repeat rate on BMT cases, due to tissue lifting off microscope slides, especially, during IHC and in-situ hybridization (ISH) staining procedures, even when normal "sticky" slides have been used.

Performance

Trajan Series 3 adhesive microscope slides, according to Glyn, "are even surpassing my expectations, on two very important criteria to note."

"Firstly, the outstanding stain definition. There is minimal background staining with the reticulin silver method." (see fig. 3)

"Secondly, what is critically important – there is no loss of the marrow component of the BMT specimen."

"Occasionally we find the difficult to adhere trabeculae "lifting", as it did on the incumbent slides."

"Having said that, in both aspects we have been able to produce high quality stains which can support patient diagnosis, and hematopathologists have commented positively on the improved quality too."

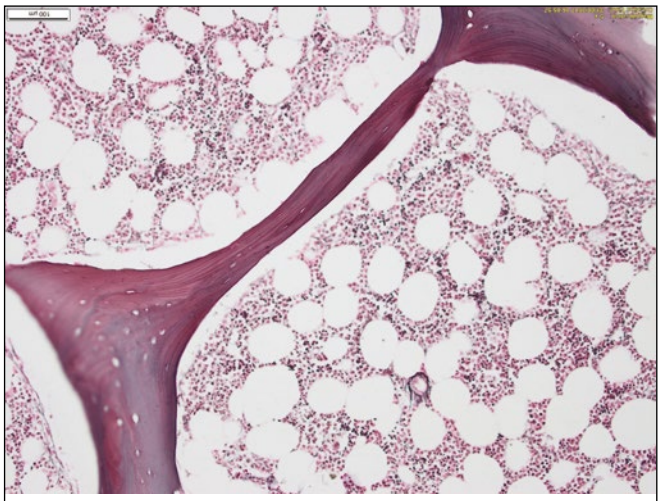

Figure 3. Minimal background staining with the reticulin silver stain of bone marrow trephine (BMT) biopsy section on Trajan Series 3 adhesive microscope slide.

The initial verification and validation exercise as part of the laboratory's ISO 15189 compliance showed Trajan Series 3 adhesive microscope slides dramatically increased the retention of tissue sections on test slides, even those which use treatment with heat-induced antigen retrieval and subsequent application of multiple reagents on the automated IHC platform.

The hydrophilic nature of the slides improved specimen retention with no tissue lifting or detachment in comparison to the incumbent.

Glyn stresses the importance of slides retaining tissue sections, clearly stipulating, “robust tissue adhesion during processing is of paramount importance.”

“During staining processes (particularly IHC and ISH), tissue loss may occur due to weak interaction of tissue with slide surface. Complete detachment or any sort of tissue damage or partial lifting of the marrow component in specimen sections can be detrimental as the results can be compromised particularly for small samples such as BMTs.”

The hydrophilic nature of Trajan Series 3 adhesive microscope slides provides stable, strong and improved section adhesion to the slide surface in order to achieve a successful stain. This is attributed to uniform distribution of reagents across the surface of the section during IHC and reduces tissue loss when used with alkaline solutions such as those emptied in the reticulin stain.

Further, the net positive surface charge imparted via amino groups offer optimum electrostatic attraction between the slide surface and BMT specimen section resulting in stronger tissue adhesion.

“Trajan Series 3 adhesive microscope slides have worked well with these BMT biopsy specimens as they provide much improved tissue adhesion during staining. Their positively charged hydrophilic nature prevents any tissue loss in this particular specimen type.”

“We do not have to worry about tissue lifting off the slide surface, which has helped us with our turnaround time too because we don’t have to repeat stains where specimens have fallen off.”

- Pam Leach, Immunohistochemistry Lead, New Cross Hospital

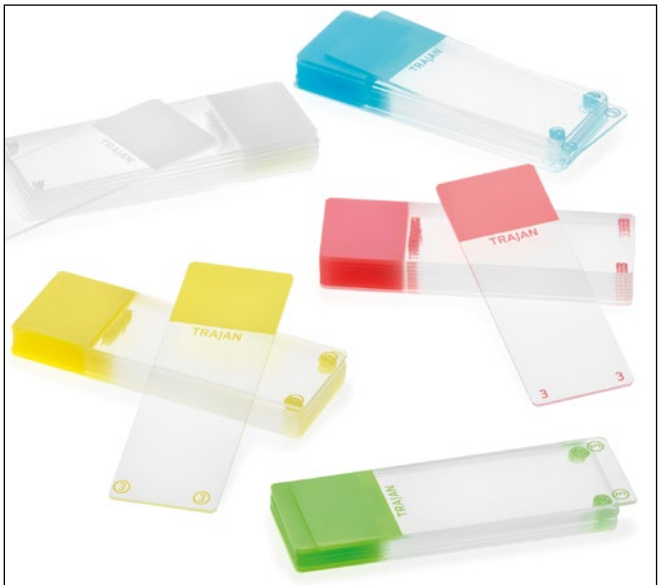

Figure 4. Trajan Series 3 adhesive microscope slides.

Conclusion

Trajan Series 3 adhesive microscope slides for BMT processing

- robust tissue adhesion of BMT specimen.
- minimal background staining with special stains such as reticulin silver.
- no loss of the marrow component of the BMT specimen during processing.
- faster turnaround on test results for patients.

Acknowledgments: Glyn Woodward, Quality Lead, and Pam Leach, Immunohistochemistry Lead, New Cross Hospital, Royal Wolverhampton NHS Trust, UK.

Information and support

Visit www.trajanscimed.com or contact techsupport@trajanscimed.com

Specifications are subject to change without notice.