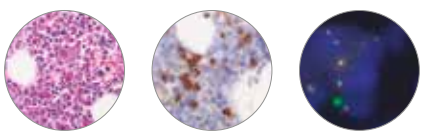
MILESTONE
HELPING PATIENTS

Optimized Molecular Results

BoneSTATION

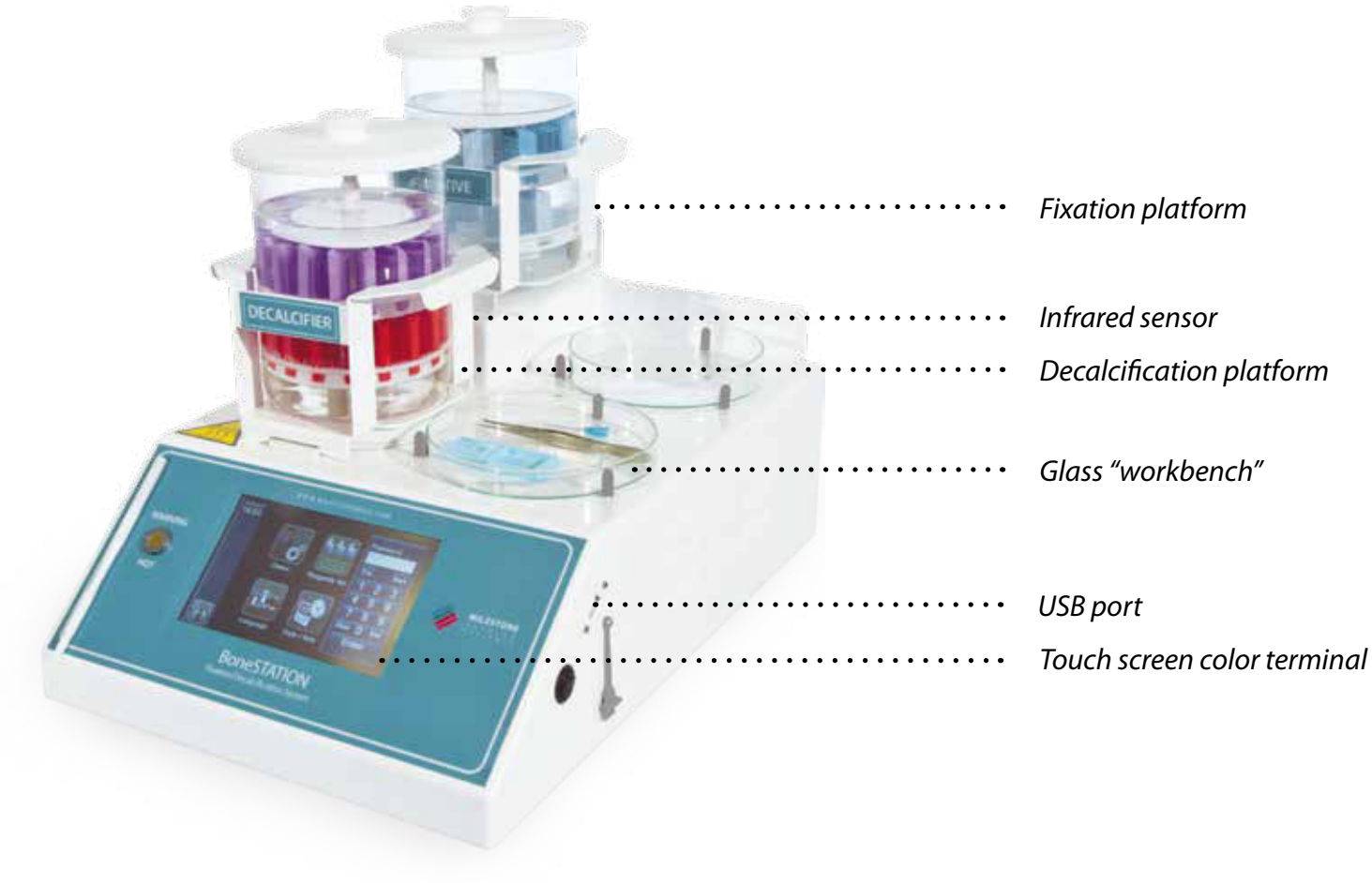
Advanced system for fixation and decalcification of bone tissues



BoneSTATION

Advanced system for fixation and decalcification of bone tissues

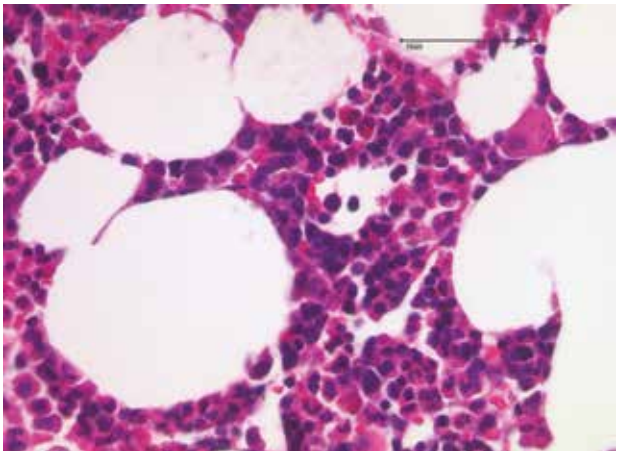
A new and innovative workstation for complete control of the all important pre-analytical step.
Provides accurate, reliable diagnostic results for morphology and molecular studies.



The BoneSTATION consists of two work platforms complete with glass modules for fixation/ decalcification.
The front platform (for the decalcification step) features a heating plate with infrared sensors for automatic temperature control up to 50°C and magnetic stirring.
The rear platform (for the fixation step) has built-in magnetic stirring only.
Two user-friendly work platforms, for easy handling of bone specimens, complete the unit.
The BoneSTATION station can be used with ANY type of fixative/decalcifier, even with strong mineral acids (HCl - HNO_3), as all contact surfaces are either glass or PTFE polymer.
The magnetic stirrer assures homogeneity of temperature throughout the solution.
The PTFE cover condenses vapors, generating a reflux of the reagent for consistent and safe protocols at constant pH.
A touch-screen terminal allows the user to optimize, standardize and fully document all the processes.

Decalcification of bone marrows

While mineral acids offer a faster decalcification rate, their protocols are more time/temperature sensitive and processed specimens are not optimal for molecular studies.
A recent report demostrates that in this case, recovery of nucleic acids is dramatically reduced.



	DNA - Yield (ng)	RNA - Yield (ng)	Decal Time
14% EDTA	67.8	226.2	2h
Formic	41.5	175.0	2h
HNO_3	11.4	51.7	2h
HCL/EDTA	5.3	30.5	2h

[2153] Effect of Decalcification Agents on Nucleic Acid Quantity and Quality
Veena M Singh et all - USCAP 2012 Poster Presentation

For this reason, Milestone favors the use of either formic acid or EDTA as "soft" decalcifiers, more suitable for molecular studies.
Longer decalcification times are reduced by the optimized agitation and temperature management featured in the BoneSTATION.

BoneSTATION typical protocols for bone marrows

Fixation	Decalcification	Temperature	Total Time
Formalin 10%	MOLdecal	°C	Fixation + Decalcification
4h	36h	27	40h
1h 30'	16h 30'	37	18h
1h	4h	50	5h

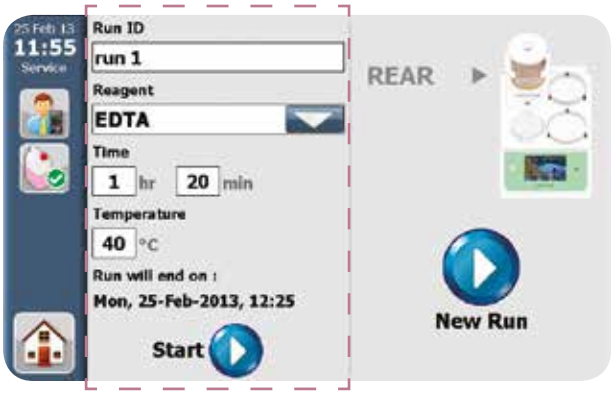
Fixation	Decalcification	Temperature	Total Time
Formalin 10%	Formic 10%	°C	Fixation + Decalcification
4h	4h	27	8h
1h 30'	1h 30'	37	3h
1h	1h	50	2h

Optimization, Standardization, Documentation

The operator is guided by the touch screen control terminal in setting up standardized and optimized decalcification protocols.
The only manual step of transferring the rack from the fixative container to the decalcifier occours when an audible alarm advises of completion of the fixation step.
Continuous stirring assures a consistent flow of fresh decalcifier on the bone surface, accelerating the decalcification process by influencing the equilibrium:

$$(\text{Bone})\ Ca^{++} \rightleftharpoons Ca^{++}(\text{Solution})$$

Combining agitation with increased temperature management accelerates the rates of fixation/ decalcification. On completion of both steps, the bone specimens are processed by conventional or rapid microwave technology.
Full documentation can be obtained through the provided USB port.



1 - Setting up a decalcification protocol

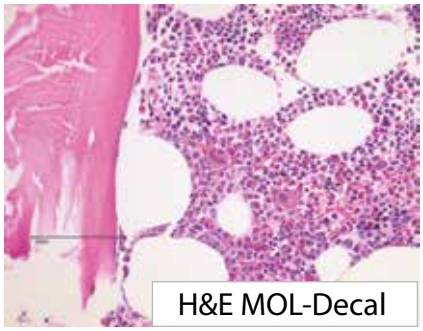
2 - Running a decalcification protocol with temperature curve

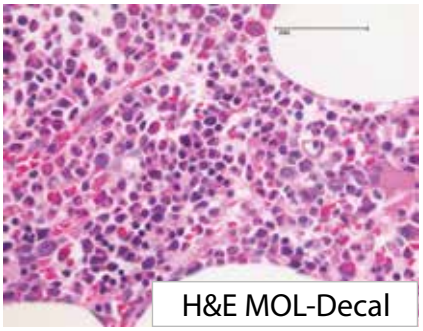
3 - Setting up a fixation protocol

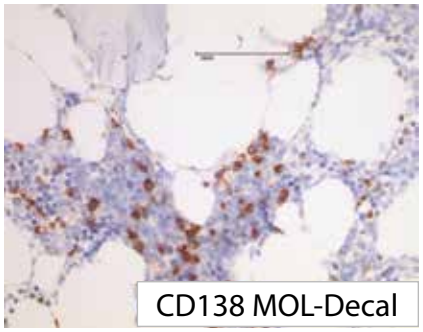
4 - Running of simultaneous fixation/decalcification protocols

Optimized Molecular Results

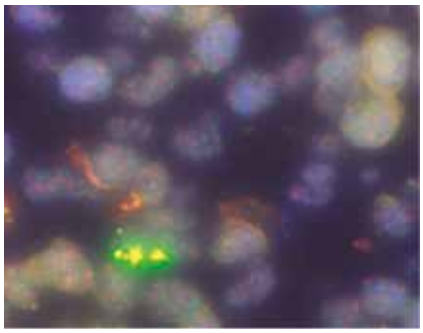
A recent presentation* during the "First Symposium on Pre-analytic of Pathological Specimens - Berlin March 2013" reported the first results on H&E, IHC, FISH and molecular using the Milestone decalcifying solution MOL-Decal on bone marrow trephine biopsies.

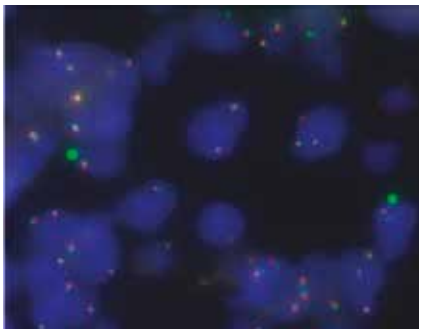

H&E MOL-Decal


H&E MOL-Decal


CD138 MOL-Decal

FISH (BCL6 Break Apart Probe, Abbott)

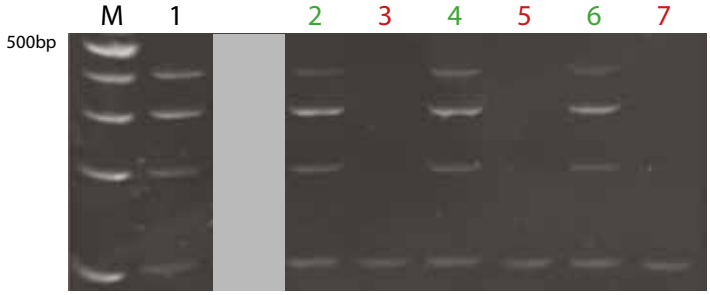

Conventional


MOL-Decal

Conventional protocol was 19 hours decalcification with a mixture of EDTA/ Formalin.

Milestone MOL-Decal protocol was 18 hours at 37 °C

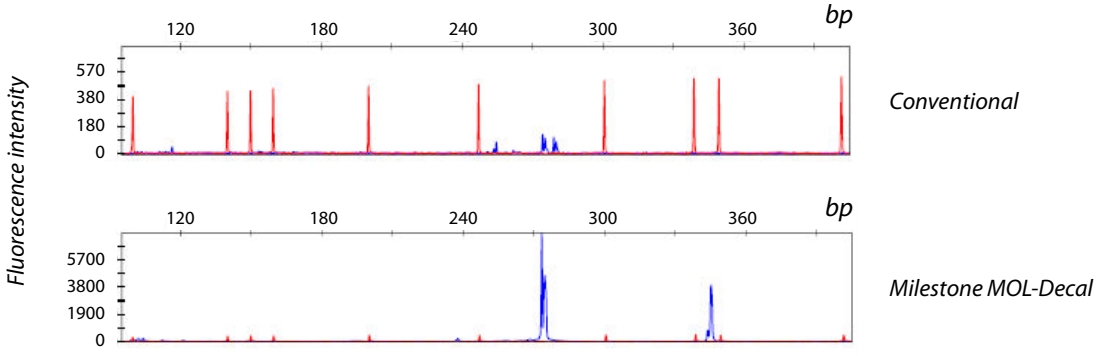
Quality control-PCR*



1: Tonsil conventional.
2, 4, 6: Milestone MOL-Decal.
3, 5, 7: Conventional.
M: size standard.

** Control multiplex-PCR: amplification of different-sized genomic segments (100, 200, 300, 400 bp) harboring single-copy genes (Biomed-2)*

Immunglobulin heavy chain gene (IGH) rearrangement (framework 2)



*__Bone marrow work-up__, *Ioannis Anagnostopoulos Institute for Pathology Charité – Campus Mitte, Berlin Germany*

Racks

Three acid resistant rack configurations with built-in stirring bar are available to fulfill all specimen sizes.

1. *Rack for 30 standard cassettes*
2. *Rack for 16 mega cassettes*
3. *Rack for 6 supermega cassettes*

The problem

Today, standard decalcifying reagents for histological applications are made of 10% EDTA, with the addition of an acid or base to bring the solution to the desired pH (7.2-7.4) for the decalcification process.

The solution: **Mol-DECALCIFIER**

An innovative decalcifying agent for optimized molecular biology results.

Milestone has developed an enhanced decalcifying solution of 10% EDTA by a proprietary mixture of EDTA salts.
This combination results is an optimized pH of 7.2-7.4, with no addition of buffer required.

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