**Bone and Teeth GRINDER**

**MillMix 20**

**MAIN FEATURES:**
- Fast and efficient grinding
- Grinding of bones and teeth
- Used in FORENSIC SCIENCE and microbiology, biotechnology, veterinary, mining ind.,

MillMix 20 is developed for scientists, who need efficient disruption of small amounts of sample.

**Easy to use**

One knob controller together with bright LED display is simple to use and gives all important information at once.

**Powerful & Quick**

Broad range of standard and custom designed tube holders makes MillMix 20 as a suitable tool for dedicated scientific work as well as daily routines. Efficient disintegration, homogenization and mixing in seconds.

**Most Advanced Technology**

Powerful DC brushless motor, which is controlled by digital processor, needs no maintenance.

**Broad range of jars & tube holders**

Largest Jar capacity 2 x 50 ml
Hard steel and stainless steel jars
Rounded PTFE Jars
Squared PTFE Jars

**Applications**

MillMix is useful tool for disintegration of several materials and can be used on different fields of science: microbiology, biotechnology, medicine, veterinary, chemistry, geology, metallurgy, mining industry, forensic science, …

**Positive Examples in Forensic Sciences**

Sample preparation for:
- Processing and DNA typing of young skeletal (no need to use liquid nitrogen).
- Processing and DNA typing of old skeletal (using liquid nitrogen).

**TECHNICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Model</th>
<th>MillMix 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>230V/50Hz or 115V/60Hz</td>
</tr>
<tr>
<td>Power</td>
<td>200VA</td>
</tr>
<tr>
<td>Time</td>
<td>5s - 60min, up to 10min in steps of 1sec, above in steps of 10s, HOLD function</td>
</tr>
<tr>
<td>Vibrating frequency</td>
<td>3 - 30Hz, in steps of 0,1Hz</td>
</tr>
<tr>
<td>Max. volume</td>
<td>2 x 50ml</td>
</tr>
<tr>
<td>Net weight</td>
<td>42kg</td>
</tr>
<tr>
<td>Dimensions</td>
<td>365 x 405 x 225mm</td>
</tr>
</tbody>
</table>

**BONE and TEETH GRINDING**

<table>
<thead>
<tr>
<th>Grinding JAR</th>
<th>Jar Volume</th>
<th>Ball</th>
<th>Time @ Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel</td>
<td>25 ml</td>
<td>Ø20 mm</td>
<td>1,5min @ 30Hz</td>
</tr>
</tbody>
</table>

We reserve the right to alter specification details etc. without prior notice or liability!
MILL MIX 20 TEST REPORT

TASK:

Application field: Forensic science

Material: Human Bone (60 years old)

Feed size: app. 1 g

Feed quantity: 1 pcs

Material specification: bones from skeletal of WW II

Customer requirements: DNA

Subsequent analysis: Real Time PCR

SOLUTION:

Configurations: Stainless steel jar volume 25ml, 1 ball diameter 20 mm

Parameters: add 3 times Liquid Nitrogen to the jar where the bone or teeth are and wait that evaporates milling 1,5 min at 30Hz

Achieved results: excellent result, the bone is ready for decalcination and for real time PCS procedure

Remarks: jar can be cleaned with Natrium Hyper Chloride

Measurements can deviate from achieved results above mentioned, depending on differences in materials. This report could be used as a reference to help users, to find the best solution for their needs.
PROCESSING AND DNA TYPING OF OLD SKELETAL REMAINS
COURSE 2014 IN LJUBLJANA, SLOVENIA, EU (5 DAYS)

13-17 January 2014
3-7 February 2014
10-14 March 2014
7-11 April 2014
19-23 May 2014
2-6 June 2014
22-26 September 2014
13-17 October 2014
10-14 November 2014
8-12 December 2014

Laboratory of Molecular Genetics
Institute of Forensic Medicine
Faculty of Medicine, 3rd floor
University of Ljubljana
Korytkova 2
1000 Ljubljana
Slovenia, European Union
Phone: 0038615437215
Assist. Prof. Irena Zupanič Pajnič, PhD
irena.zupanic@mf.uni-lj.si

- UNIQUE COURSE IN A FORENSIC MOLECULAR GENETICS LABORATORY EQUIPED SPECIALLY FOR PROCESSING OLD BONES AND TEETH WITH FORENSIC HUMAN IDENTIFICATION METHODS (THE COURSE IS SUITABLE ALSO FOR THE PARTICIPANTS WHO WOULD LIKE TO PERFORM IN THEIR LABORATORIES THE IDENTIFICATION OF RELATIVELY FRESH HUMAN REMAINS WHERE NO OTHER MATERIAL THAN BONES OR TEETH ARE LEFT FOR MOLECULAR GENETIC ANALYSES)
- SPECIAL ROOM FOR CLEANING, CUTTING, AND GRINDING OF BONE MATERIAL
- EXPERIMENTAL INDIVIDUAL WORK WITH APPROXIMATELY 70 YEARS OLD BONES
- THE COURSE WILL PROVIDE THE PARTICIPANTS FIRST-HAND KNOWLEDGE OF HOW TO PERFORME BONE DNA TYPING
- THE COURSE IS DESIGNED TO DELIVER ADVANCED LEVEL TRAINING TO EXPERIENCED LABORATORY BASED SCIENTISTS WHICH ARE FAMILIAR TO DNA TYPING TECHNOLOGIES
- COURSE MATERIALS AND TRAINING LITERATURE
- CERTIFICATE OF ATTENDANCE ON THE COURSE
- MAXIMUM OF THREE PARTICIPANTS
Introduction:
In case where unidentified skeletonised human remains are found and identification could not be performed with classical forensic medicine methods, bones or teeth can be used for molecular genetic identification. DNA typing using bone and tooth samples has been successful in forensic identification analysis and anthropological studies. Nuclear DNA is the preferred genome of amplification for forensic purposes as it is individually specific and provides bi-parental kinship information. The condition of the skeletal remains analysed for forensic identification studies is often not ideal for DNA recovery. In old bones and teeth, small amounts of endogenous DNA, the presence of polymerase chain reaction (PCR) inhibitors, the degradation of the DNA and the exceptional risk of contamination limit the success of DNA typing. In the past, mitochondrial DNA testing was regularly employed in the forensic identification of aged skeletal remains. Recently, some researchers (among them there is also our group) report the successful typing of nuclear STRs from ancient material. Our group successfully identified victims of massacres that took place during and after the Second World War in Slovenia, and we managed to obtain nuclear DNA for successful STR typing from skeletal remains excavated from Auersperg chapel archaeological site that were over 300 years old.

<table>
<thead>
<tr>
<th>Identifier (ABI)</th>
<th>PowerPlex 16 (Promega)</th>
<th>PowerPlex ESX 17 (Promega)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MiniFiler (ABI)</td>
<td>NGM (ABI)</td>
<td>Investigator ESSplex (Qiagen)</td>
</tr>
</tbody>
</table>

Laboratory of molecular genetics:
In the Laboratory for molecular genetics of Institute of Forensic Medicine which was established in 1996, molecular genetic analyses of ancient DNA are performed since 2005. In 2008 our laboratories were restored and equipped with modern molecular genetic analyses machines (safety cabinet MC-3 (Iskra-Pio) for drilling and cutting of bones, Bead Beater MillMix 20 (Domel-Tehtnica) for grinding of bones and teeth, Biorobot EZ1 (Qiagen) for purification of DNA, 7500 Real Time PCR System with HID Real-Time PCR Analysis Software v. 1.1 (Applied Biosystems), ABI PRISM™ 3130 Genetic Analyser with Data Collection v. 3.0 Software and GeneMapper ID v. 3.2 Software (Applied Biosystems), and organization of the rooms in accordance to prevent contamination.
Description of the course:

- The course has a practical hands-on emphasis.
- The laboratory set-up will be shown.
- The characteristics of ancient DNA and the environmental factors which affect its preservation will be discussed.
- The recommendations for excavation, storage and molecular genetic identification of skeletal remains will be presented.
- The most appropriate type of bones and teeth for genetic analyses will be described.
- The measures for preventing contamination in DNA laboratory will be shown.
- Procedures for processing the bone sample (mechanical and chemical cleaning, cutting, and grinding into the powder in presence of liquid nitrogen), decalcification of bone powder, DNA extraction, DNA purification, DNA quantification with real-time PCR, DNA typing of nuclear STRs (we will use one of the European Standard Set of STR loci amplification kit), electrophoretic separation of amplified fragments (3130 Genetic Analyser) and interpretation of STR profile (evaluation of DNA typing results) will be shown on concrete bone sample and some of the steps will be experimentally performed by participants (especially processing the bone sample).


**Location and how to find us:**
Our Laboratory for Molecular Genetics at Faculty of Medicine is situated 1.5 km from centre of Ljubljana, the capital city of Slovenia. We are the part of European Union and our neighbours are Italy and Austria.

Our address:
Laboratory of Molecular Genetics
Institute of Forensic Medicine
Faculty of Medicine, 3rd floor
University of Ljubljana
Korytkova 2
1000 Ljubljana
Slovenia, EU

**Accommodations:**
There are numerous hotels in the area (you can look for the hotels in the centre of Ljubljana) but the nearest to the Faculty of Medicine are Hotel Park and Hostel Celica:

- **Hotel Park**
  Tabor 9
  1000 Ljubljana
  Email: recepcija@hotelpark.si
  Website: www.hotelpark.si
  ✓ A single room 55 euro per night (including self-service breakfast)
  ✓ A double room 38 euro per night per person (including self-service breakfast)

- **Hostel Celica**
  Metelkova 8
  1000 Ljubljana
  Email: recepcija@hostelcelica.com
  Website: www.hostelcelica.com
  ✓ A single room 53 euro per night (including self-service breakfast)
  ✓ A double room 28 euro per night per person (including self-service breakfast)
REGISTRATION

The registration fee includes course material for experimental work (old bone material, reagents, equipment for processing and nuclear DNA typing of bones), training literature (protocols and monograph published in 2013 by Lap Lambert Academic Publishing) and daily lunch.

Please check which week you are registering for:

- 13-17 January 2014
- 3-7 February 2014
- 10-14 March 2014
- 7-11 April 2014
- 19-23 May 2014
- 2-6 June 2014
- 22-26 September 2014
- 13-17 October 2014
- 10-14 November 2014
- 8-12 December 2014

- The registration fee: euro 1050 (exclusive 22% VAT) per participant (total 1281 EUR)
- Each participant is responsible for making his or her own hotel reservation
- Upon receipt of your registration and payment you will receive a confirmation e-mail
- The deadline for registration and payment is four weeks before the each course
- In the event of insufficient registrations, this course will be cancelled

Check or Purchase Order must accompany registration:

Name: ___________________________________________________________
Organization: _____________________________________________________
Address: _________________________________________________________
City: _____________________________________________________________
Country: _________________________________________________________
Phone: ___________________________________________________________
E-Mail: __________________________________________________________

INFORMATION FOR REMITTANCES

ADDRESS OF BANK ACCOUNT HOLDER: UNIVERZA V LJUBLJANI, MEDICINSKA
FAKULTETA, VRAZOV TRG 2, 1000 LJUBLJANA, Slovenia, EU
PURPOSE OF PAYMENT: Bone DNA Course - ISM
BANK NAME: BANKA SLOVENIJE
BANK ADDRESS: SLOVENSKA CESTA 35, LJUBLJANA, SLOVENIA
BANK ACCOUNT NUMBER: 56011006030708380
IBAN OR BIC CODE: SI56011006030708380
SWIFT CODE: BSLJSI2X
TAX NUMBER: SI44752385

Mail registration to: irena.zupanic@mf.uni-lj.si
Check or Purchase Order must accompany registration
Genetic Identification of Second World War Victim's Skeletal Remains