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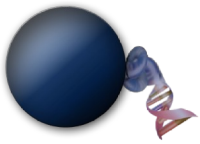
MagSi-DNA mf
MagSi-DNA mf COOH

Nucleic Acid Purification
in Microfluidic Systems

Microfluidics

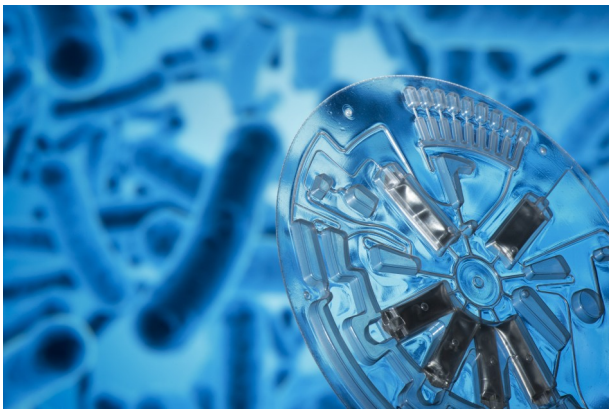


Microfluidics deals with the precise control and manipulation of fluids which are geometrically constrained to a small, typically sub-millimeter, scale. In the field of molecular biology the whole DNA extraction, amplification and detection process can be integrated on a chip. This not only simplifies the process for end-users, but also implies a significant cost reduction per preparation. Miniaturized setups even allow for the development of multiplexed assays (e.g. qPCR). Faster protocols are possible due to the shorter reaction steps and/or quicker separation times. This trend will make the development of portable devices for point-of-care diagnostics easier.

MagSi-DNA mf and **MagSi-DNA mf COOH** are special magnetic beads developed for use in microfluidic and chip-based genomic setups. These beads can be applied for the extraction of nucleic acids within the confined spaces and channels of DNA-chips, but are also suited for MTP and tube formats.

Features

- Unique magnetic core with silica shell
- Small bead diameter, large active silica surface
- High yields and good nucleic acids quality
- Instant collection, even in a weak magnetic field
- Easy to resuspend
- Very well suited for typical nucleic acid applications such as multiplex qPCR, LAMP etc.
- Compatible with drying/reconstitution cycles for stable storage
- Also applicable in MTP-based extraction processes and then easy to automate on liquid handlers (e.g. Hamilton STAR line, Tecan EVO, KingFisher)
- Suitable for both DNA and RNA extraction
- Can be integrated in microfluidic platforms for point-of-care applications; performance will equal or exceed competitors' products for *in situ* extraction and purification of nucleic acids

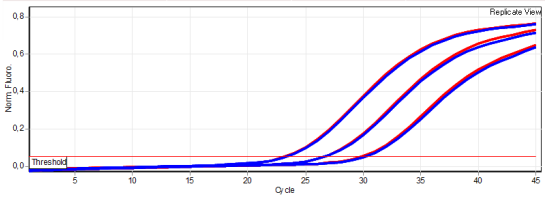


Centrifugal microfluidic LabDisk platform where the MagSi-DNA mf beads were first used [1] Source: Hahn Schickard, Bernd Müller Fotografie.

DNA Extraction in microfluidic conditions

DNA extraction in a microfluidic setup is not different from the regular principle in tubes or plates. It is based on the reversible adsorption of nucleic acids to magnetic beads under appropriate buffer conditions. The magnetic beads are brought in contact with the sample (lysis is optional) under conditions which binds the DNA. After magnetic separation, the magnetic beads are washed several times to remove contaminants and salts. Finally, purified DNA can be eluted from the magnetic beads and directly used in the chip for downstream applications.

DNA concentration (in pg/µL)	0.1	1	10
MagSi-DNA mf	29,81±0,43	26,56±0,09	23,18±0,07



Extraction kits using MagSi-DNA mf (red curves) and competitor's beads (green curves) on bacterial DNA were compared by means of downstream qPCR. MagSi-DNA mf beads demonstrate no PCR inhibition.

Primers/probes were provided by the Austrian Institute of Technology GmbH, Austria. DNA was provided by the University of Zurich, Switzerland. Extractions and qPCR were conducted at Hahn-Schickard, Germany.

Art. No.	Product	Art. No.	Product	Quantity
MD0200010002	MagSi-DNA mf	MD0200040002	MagSi-DNA mf COOH	2 mL
MD0200010010	MagSi-DNA mf	MD0200040010	MagSi-DNA mf COOH	10 mL
MD0200010100	MagSi-DNA mf	MD0200040100	MagSi-DNA mf COOH	100 mL

[1] O. Strohmeier, et al., Chem. Soc. Rev., 2015, 44, 6187-6229

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