



Magnetic Tweezers Technology --- Consumer Enquiry

Magnetic tweezers is a tool that allows one to stretch and twist micron-size magnetic beads anchored to a biological material of interest (biomolecules or cells). Depending on the size of the beads and the distance of the magnets to the sample, forces of few hundred picoNewtons can be applied on the system. By rotating the magnets an arbitrary and reversible degree of twist can be imposed on the studied molecule (e.g. DNA). By monitoring with bright field microscopy the 3D fluctuations of a tethered bead, the stretching force and/or the visco-elastic response of the biological system can be deduced.

The technique has been used as long ago as 1950 by F.H.C.Crick to study the elasticity of single cells (*Exp.Cell Res.* **1**, 37-80 (1950)). It has been used in the past 10 years for single molecule studies (DNA, DNA/protein interactions, F1-ATPase, etc.). The purpose of this enquiry is to evaluate the level of interest and the requirements of the research community for this type of technology.

General research environment

- What is your area of research (e.g. Molecular Biology, Biophysics,)?

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- What specific subject(s) do you study (e.g. cell adhesion or motility, intracellular transport, regulation pathways, DNA replication,)?

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- What specific biological techniques do you use (e.g. DNA arrays, RNAi, GFP-fusions,)?

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- What specific physical techniques do you use (e.g. fluorescence or confocal microscopy, AFM, electron microscopy, optical tweezers,)?

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Single molecule and micromanipulation techniques

- Are you interested in single molecule studies and manipulation techniques?

Yes / No / no opinion

- Do you think that they provide new biologically relevant information?

Yes / No / no opinion

- Do you think that single molecule techniques will develop in the future?

Yes / No / no opinion

- Are you already using or are you planning to use them ?

Yes / No / no opinion

- If yes - which techniques are you using or do you plan to use?

- o Optical tweezers
- o Magnetic Tweezers
- o Atomic Force Microscopy
- o Optical methods, FRET, TIRF, FCS, Nanocrystals
- o Others

Magnetic tweezers specifications

- Are you interested in using magnetic tweezers for your research?

NO. Thank you! Please return this enquiry to the address below.

YES. Thank you!! Please answer the questions below.

- For what purpose would you use magnetic tweezers?

- o Single Molecule manipulations?

- DNA/protein interactions
- Study of protein motors (e.g. kinesin, myosin,...)
- Study of rotary motors (F1-ATPase, flagella)
- Others

- o Study of cellular properties?

- Cell adhesion
- Cellular visco-elastic properties
- Intra-cellular transport
- Membrane proteins
- Others

- o Others

- What type of magnetic tweezers set-up would you prefer?

- o A “plug and play” version?
- o An open version that will allow you to modify both the hardware and the software?
- o Other

- Would you be interested in a magnetic tweezers set-up coupled with epifluorescence microscopy? Yes / No / no opinion

- Would you be interested in a temperature controlled magnetic tweezers set-up? Yes / No / no opinion

- o What temperature range? $T_{\min} = \dots\dots\dots^{\circ}\text{C}$ $T_{\max} = \dots\dots\dots^{\circ}\text{C}$
- o What level of temperature control? $\Delta T = \dots\dots\dots^{\circ}\text{C}$

- Which features would you like to find in a magnetic tweezers set up?

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- At what price would you consider buying a magnetic tweezers set up?

Price: \$.....

Your institution

- Do you work for a private or public institution?

- Private Public

- In which country do you work?

- What is the annual budget of your lab for equipment/consumables?

Equipment/consumables budget: \$.....

Personal data (optional)

- Your name and address

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..... e-mail:.....

Thank you for answering this form. Could you please send it to:

Olivier Croquette, les grandes terres, 69210 Bully, France, or
contact@picotwist.com