Descriptions:

**Bead shearing: DNA sample is sheared by vortexing in a round-bottom 2 ml tube in the presence of a glass bead.** *A) No special instrumentation needed (+), B) Costs per prep are negligible (+), C) A minimal volume of 5 µl can be used (+), D) Simple procedure can be performed in 1 minute (+).*

**Needle shearing [1]: Relies on shearing forces created by passing DNA through a small gauge needle.** *A) No special instrumentation needed (+), B) Blunt-end needle and syringe cost $1.50-$2.50 (+/-), C) Not optimally suited for volumes below 20 µl, but 10 µl can be processed with some extra effort (+/-), D) Problems with the dead volume make processing challenging, laborious procedure, less suitable for multiple samples (+/-).*

**Centrifugal shearing [2]: Shearing forces are introduced by centrifuging DNA through a hole of defined size in a microfuge type tube.** *A)**Specialized tube can be used in standard microcentrifuge (+), B) with $30 per sample considerable costs (-), C) Requires 150 µl sample volume (-), D) Easy to use with single centrifugation step (+).*

**Sonication [3,4,5,6]: Sonicators subject DNA to unfocused, longer-wavelength acoustic energy; sonicators require a cooling period between sonication bursts. Many different systems are available employing either a probe or -bath design.** *A) Requires specialized equipment (-), B) Consumable costs per sample depend on the system and may be considerable, but some devices allow for the use of standard laboratory plastic ware (+/-), C) Requires sample volume of at least 20 µl (-), D) Sonication takes several minutes and requires optimization for different sample types. Multiwell formats exist. (+/-).*

**Acoustic shearing [7,8]: Short-wavelength, high-frequency acoustic energy is focused on the DNA sample, physically disrupting the DNA molecule (Adaptive Focused Acoustics technology); requires temperature control.** *A) Requires specialized instrumentation (-), B) Requires use of special tubes that cost >$5 per sample (-), C) Volumes >100 µl are used (-), D) Setting of instrumentation and loading and unloading vials costs time but procedure can be standardized and used in multiwell formats (+/-).*

**Nebulization [9,10]: Shearing by nebulization via a high-pressure air flow that pushes the sample liquid through a narrow orifice.** *A) Requires the presence of compressed air, argon or nitrogen tanks, which are not standard in all lab settings (+/-), B) Although not commonly in use anymore, disposable units represent considerable costs per sample (-), C) Working volume is 750 µl, requires minimal DNA input amount of 3 µg (-), D) Laborious workflow that includes ethanol precipitation (-).*

**Hydrodynamic shearing [11,12,13,14,15,16,17]: A syringe pump generates hydrodynamic shear forces within a tube or a pore (point-sink principle); the size of the constriction and the flow rate of the liquid determine the DNA fragment size.** *A) Requires instrumentation. Many different instruments and solutions are available (-), B) No consumables needed for sample processing (+), C) Requires volumes of >100 µl, chip-based formats exist (-), D) Depending on system process can be standardized and automated but system tubing needs to be cleaned after each sample (+/-).*

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