

Underlying Theories for Laser Microdissection and Non-Contact Isolation

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Abstract:

Laser microdissection has become a mandatory tool for materials refinement in molecular biologic research. The essences of life and diseases, i.e., how things are related as DNA to mRNA to protein are discovered by investigation directly in, e.g., expression profiles of protein.

But how to increase signal to noise on a molecular level? Extraction of well-defined portions of the tissue under investigation is key to enrich material up to a level well over the limit of detection. Applying the focused laser for clear-cutting to separate and again to isolate without touching the sample and impairing it though: This is key to a technology called “LMPC”: *Laser Microdissection and Pressure Catapulting*.

We will present a feasible mechanism for driving the microdissects from a glass carrier into receptacle[1]. As all forces are exerted by light only, we discuss the influence of plain impulse, plasma formation, evaporation of matter and thermal expansion to the effect. Evidence is given by interpretation of schlierenimages and high-speed photography of the microdissects and calculations of energy densities[2]. Moreover, an outlook to effects of shorter pulse durations applied in LMPC is given[3].

References:

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