A new experimental setup for a high throughput controlled Non-Photochemical LASER-Induced Nucleation (NPLIN). Application to Glycine crystallization

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Supporting information

Table S1 Acronyms used in various papers for describing the LASER induced nucleation experiments.

Acronym		**References**
NPLIN	Non Photochemical LASER Induced Nucleation	1,2,3,4,5,6,7,17,19,20,21,22,23,24,38,
LIM	LASER Induced Method	15
LIGHT	LASER Irradiated Growth Technique	9
FLI	Femtosecond LASER Irradiation	10
FCWNILB	Focus Continous Waves Near Infared LASER Beam	25
LIN	LASER Induced Nucleation	8,30
LIC	LASER Induced Cavitation	31
FLIN	Femtosecond LASER Induced Nucleation	11,13,18,27,32
PCWLB	Polarized Continous Waves LASER Beam	33
SLP	Single LASER Pulsed	36
SFL	Single Femtosecond LASER	37

1 = (Garetz et al., 1996), 2 = (Zaccaro et al., 2001), 3 = (Garetz & Matic, 2002), 4 = (Matić et al., 2005), 5 = (Sun & Garetz, 2006), 6 = (Sun et al., 2008), 7 = (Alexander & Camp, 2009), 8 = (Knott et al, 2011), 9 = (Adachi et al., 2003), 10 = (Nakamura, Sora et al., 2007), 11 = (Murai et al., 2010), 12 = (Yennawar et al., 2010), 13 = (Nakayama et al., 2013), 14 = (Hosokawa et al., 2005), 15 = (Tsunesada, 2002), 16 = (Nakamura, Hosokawa et al., 2007), 17 = (Lee et al., 2008), 18 = (Yoshikawa et al., 2009), 19 = (Sun & Garetz, 2009), 20 = (Alexander & Camp, 2009), 21 = (Ward et al., 2009), 22 = (Ward et al., 2011), 23 = (Ward & Alexander, 2012), 24 = (Ward et al., 2012), 25 = (Rungsimanon et al., 2010), 26 = (Yuyama et al., 2012), 27 = (Nakayama et al., 2013), 28 = (Yuyama et al., 2010), 29 = (Iefuji et al., 2011), 30 = (Soare et al., 2011), 31 = (Murai et al., 2011), 32 = (Yuyama et al., 2012), 33 = (Uwada et al., 2012), 34 = (Tsuboi et al., 2007), 35 = (Jacob et al., 2012), 36 = (Liu et al., 2013), 37 = (Spasojevic-de Biré, 2013), 38 = (Ikni et al., 2014).

Table S2 Needs and solution developed in our high-throughput NPLIN experimental setup.

	Needs	**Solutions**
Sample holder	Use small quantity of chemicals	HPLC tube
	Have a better experimental statistics	A sampler holder designed to carry 90 tubes
	Avoid focusing from the tube	Beam comes from the top of the tube through planar glass plate
	Keep temperature constant	Design the sample holder to allow a coolant flow.
	Expose each sample to the LASER and observe each samples	Design of a rotatiting carrousel controlled by a step by step motor.
	Allow entry of the beam from the top	Plug hole with a glass plate. The seal will be provided by a joint
Temperature control	Control sample's temperature	Coolant flow
	Distribute the coolant	Cryothermostat (closed circuit)
	Control coolant's temperature	Thermocouples
Optical path	Control exposure time	Electronic shutter
	Record beam intensity	Wattmeter
	Real time recording of the beam intensity	Deviation of a small part of the beam using a thin glass plate
	Redirect beam to the tube at 90°	Mirror
In situ following	Follow *in situ* nucleation	Optical *in situ* following
		Inverted microscope
	Record real time nucleation	CCD Camera
Automation	Have a versatile automated high-throughput experiment	Write a complete specifications manual
		LabView programmation
Ergonomy	Access to the information at any time of the experiment	Development of a human / machine interface
	Safe of the operator environment	Movable cover to completely isolate the optical region of the outer
	Permit movement of the handling	Mobile trolley

Table S3 Initial polymorph used in this paper and experimental conditions.

Figure	Initial polymorph	Product	Supersaturation	Temperature (K)	mass (mg) for one mL
5	γ	Sigma Aldrich G 7126	1.11 - 2.23	290	205.2 (1.1) - 317.13 (1.7)
6	γ	Sigma Aldrich G 7126	1.11 - 1.68	290	205.2 (1.1) - 279.8 (1.5)
7	α	Peptides international	1.45	293	287.3
8a	α	Peptides international	1.8	290	358.02
8b	α	Peptides international	1.45	290	270.5
10	α	Peptides international	1.35 - 1.6	290	251 (1.35) - 297 (1.6)

Figure S1 Non-Photochemical LASER-induced Nucleation experiments definition.

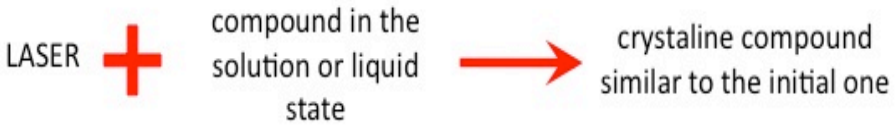

Figure S2 Schematic representation of the fluid inside the carrousel setup.