

sunscreen



UNCHAINED
LABS

高效量产纳米颗粒

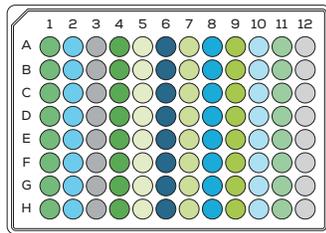
从精心设计有效载荷到微调递送配方，打造完美的治疗性纳米颗粒往往耗时漫长。最棘手的是，传统方法每次仅能完成单次实验。Sunscreen彻底颠覆流程——一天之内即可制备96种微量纳米颗粒配方，让您筛选的有效载荷与配方数量远超想象。

- 离手式自动筛选
- 单次实验3—4分钟
- 单次实验用量400 μL (3:1)
- 自动清洁
- 微流控芯片可重复使用
- 方法可扩展至GMP生产

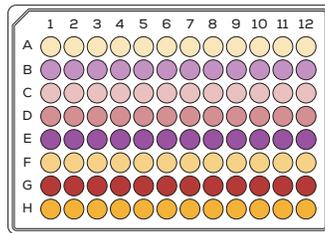


洞察数据矩阵

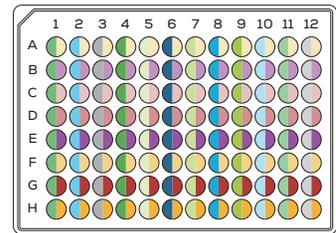
Sunscreen从一微孔板中提取缓冲处理的有效载荷，从另一微孔板中获取纳米颗粒构建模块混合液，快速制备目标颗粒。您可执行高达96组的实验集群进行深度数据分析，亦可仅载入单排最新优化配方——无论何种需求，Sunscreen的自动化系统皆能精准执行。



96 x 300 μ L of payloads



96 x 100 μ L of
nanoparticle precursors

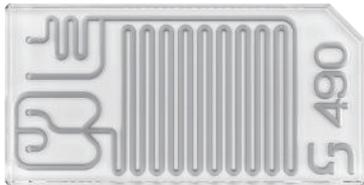


96 x 400 μ L of
payload-filled nanoparticles

畅流体验，自在掌控

待微孔板载入后，即可用微流控芯片Sunny开启纳米颗粒混合制备。Sunny微流控芯片具备无限次重复使用的特性，提供9种构型尺寸选择，适配各类应用场景。微流控芯片秒速可换，实验后自动完成清洁；当您需扩大生产规模时，其持续运行能力远超人工上限。

Sunny Trident



- 反向角度混合
- 在线稀释

Sunny X



- 十字交叉混合
- 多种通道尺寸

Sunny T



- T型混合
- 多种通道尺寸

设置无忧，自动运行

在Sunny Suite软件中设定微孔板组分、混合比例及流速参数，即可启动全自动流程。内置验证程序实时监测每项实验，确保批次运行零差错。当一天还未结束，整板纳米颗粒早已批量产出，您仍有充裕时间在下班前启动缓冲液置换或表征分析。

The screenshot displays the Sunny Suite V1.0.0 software interface. The main window is titled "mRNA-LNP Demo-1" and shows the configuration and execution details for an experiment. The interface is divided into several sections:

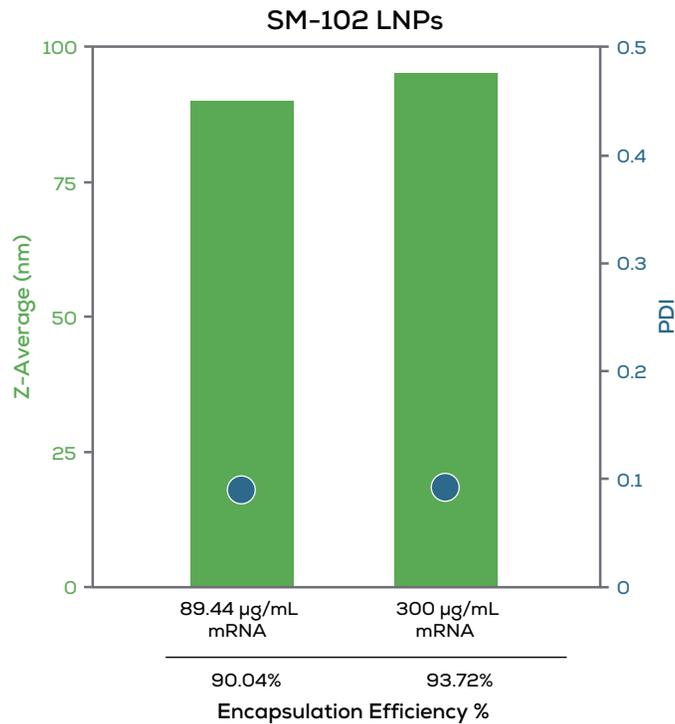
- Protocols:** A sidebar on the left lists protocol families, including "Sunscreen Experimental Protocol", "Sunscreen-Needle Setting", "Sunscreen-Priming Protocol", and "Sunscreen System Initialize". The "mRNA-LNP Demo-1" protocol is selected.
- Description:** A text box containing the protocol description: "mRNA-LNP Test (6 EXPERIMENTS, A CHIP CONFIGURATION, YES ADT, 3 CLEANING CYCLES), YES DILUTION".
- Apparatus:** A table defining the function and device for each input and collection point.

Function	Device
Input 1	Input 1
Input 2	Input 2
Collection	Collection
- Parameters:** A table showing the configuration for the Sunscreen-Protocols.

Name	Value
Configuration	1 parameter(s)
- Execution Time:** A digital clock showing "00:00:24".
- Image:** A photograph of the Sunny Suite hardware, a multi-channel liquid handling workstation.
- Status:** The status is "Experiment 01/06: Preparation". Below this are "Start" and "Stop" buttons, and radio buttons for "Run all rows" (selected) and "Run from row n".
- Output:** A log of execution events, including "Sunscreen Experimental Protocol V1.0.0.1", "Sunscreen Experimental Protocol Starting", "Sunscreen Experimental Protocol Input 1 well plate definition assigned (ST Scientific 2.2 ml Round Bottom (720908))", "Sunscreen Experimental Protocol Input 2 well plate definition assigned (ST Scientific 2.2 ml Round Bottom (720908))", "Sunscreen Experimental Protocol Running all experiments", "Sunscreen Experimental Protocol System preparation", "Exp01: Preparation", "Exp01: Dilution not used", "Exp01: A-1.1: Input 1 Stack - System preparation", "Exp01: A-1.1: Input 1 Stack - Filling system pump", "Exp01: Input 1 Stack System Pump: Fill at rate 8000 µl/min", "Exp01: Input 1 Stack System Pump: Needs filling", "Exp01: Input 1 Stack System Pump: State set to Filling", "Exp01: A-1.2: Input 2 Stack - System preparation", "Exp01: A-1.2: Input 2 Stack - Filling system pump", "Exp01: Input 2 Stack System Pump: Fill at rate 8000 µl/min", "Exp01: Input 2 Stack System Pump: Needs filling", "Exp01: Input 2 Stack System Pump: State set to Filling", "Exp01: B-1: Input 1 Stack - Input preparation of mRNA Acetate", "Exp01: B-2: Input 2 Stack - Input preparation of SM-102 Ethanol", "Exp01: C: Collection Stack - Collection preparation", "Exp01: Input 1 Stack System Pump: State Filling", "Exp01: Input 2 Stack System Pump: State Filling".
- Manual Control:** A section at the bottom showing the status of the Input 1, Input 2, and Collection modules. Each module is currently "Busy" and has a "Stop" button. Below the status are "Current Readings" for Pressure (System) and Pressure (Sample) for each module, all showing 0.3 bar.

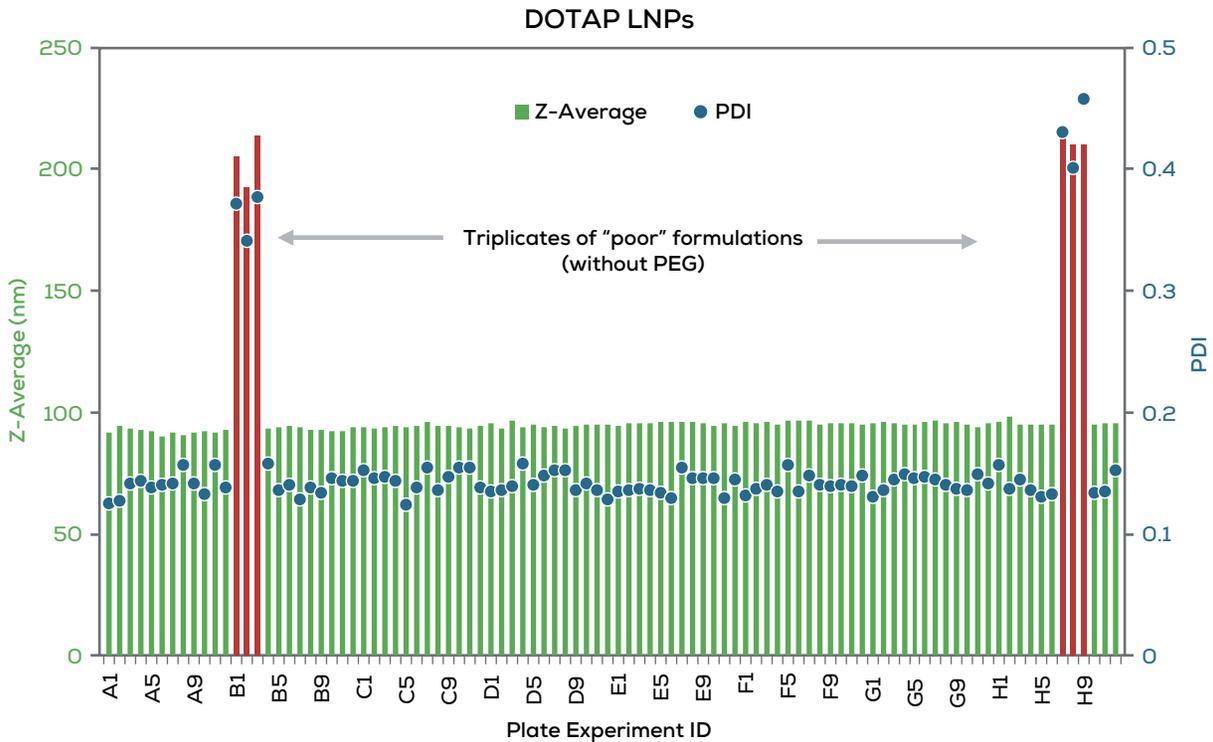
小材大用，高效突破

核酸类原料成本高昂且制备艰难。Sunscreen支持浓度与体积灵活调控，大幅节省珍贵有效载荷用量，助您在筛选优胜配方（MVP）时显著降本。结合可重复使用的耗材与单次少于15分钟的设备操作时长，96种配方即刻完成，优质方案唾手可得。



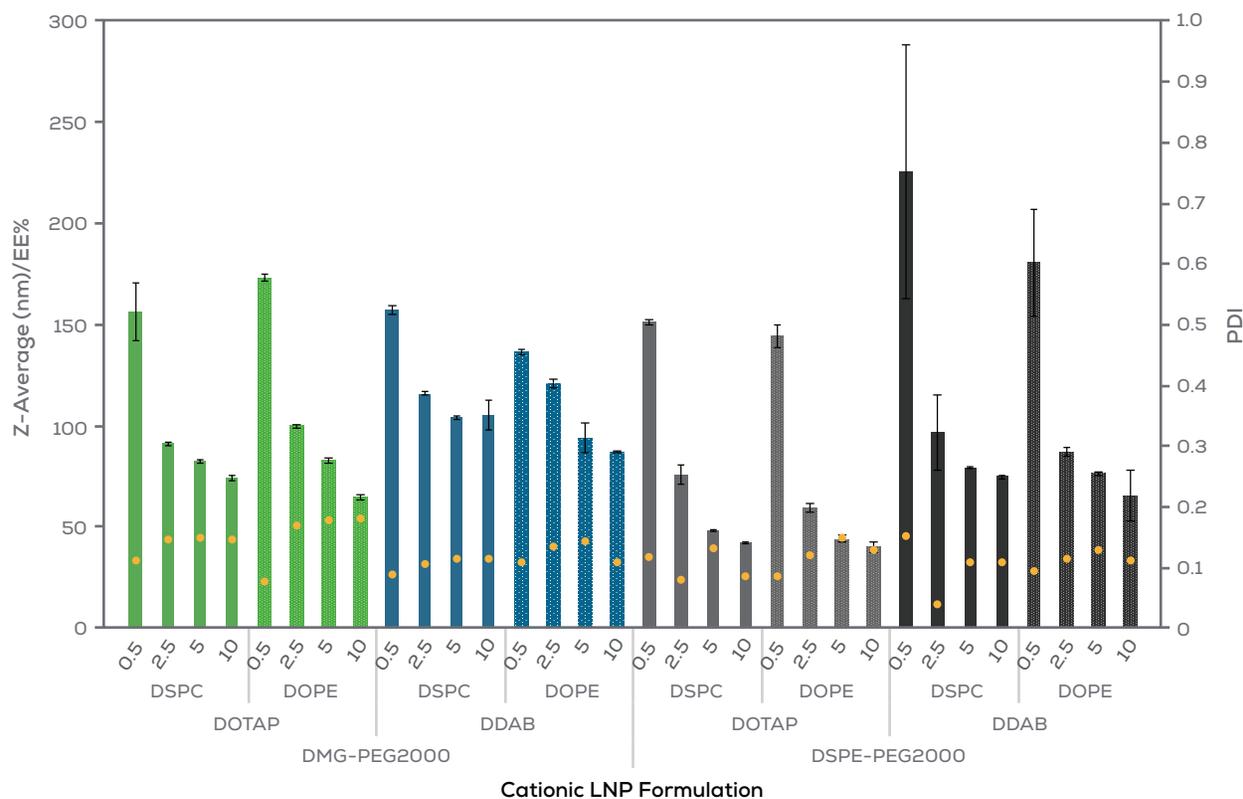
可靠保障，精准交付

当Sunscreen完成整板制备，每种配方均能确保高度一致性。实验间自动清洗杜绝残留，欠佳配方绝不干扰后续优质配方。若需强化工作效率，搭配荧光增强模块的设备Stunner AF，即可同步检测粒径、载药量与包封率，精准锁定优质方案。



精准筛选，高效递进

Sunscreen助您海量测试配方，去芜存菁锁定优质组合，精准达成有效载荷递送与颗粒性能目标。当顶级配方脱颖而出，可无缝衔接至Sunshine进行工艺优化，最终经Sunbather实现GMP生产——Sunny Suite系列全程护航。



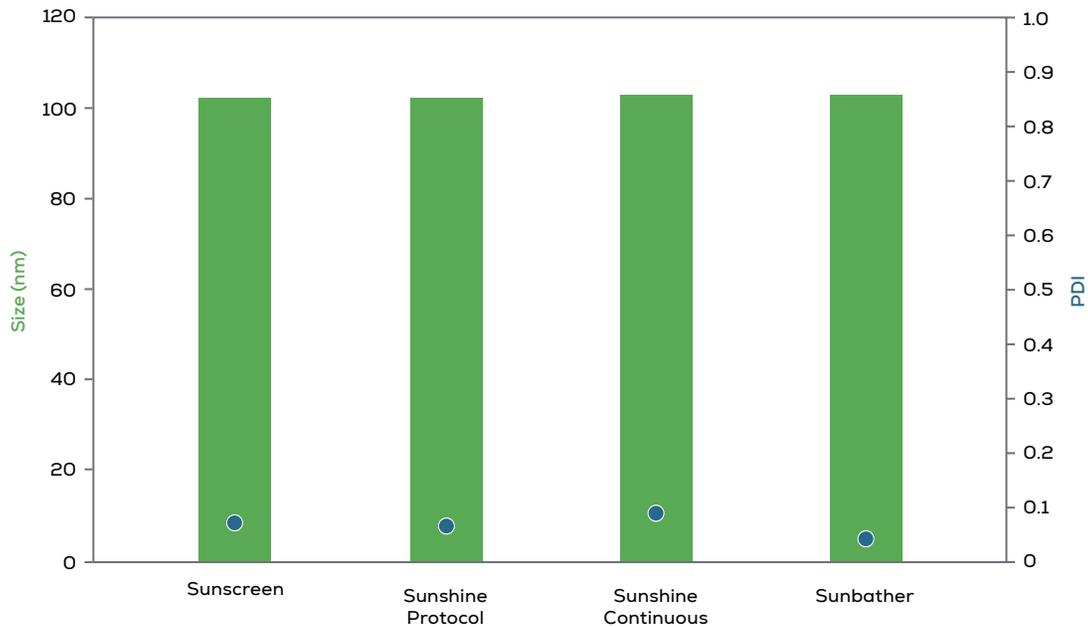
Sunny Suite全流程解决方案

Sunny Suite为纳米颗粒研发提供全流程技术支持：Sunscreen实现96种配方组合的高通量自动化初筛；Sunshine通过自动实验与连续流模式精准锁定理想混合工艺参数；当推进至临床试验阶段，Sunbather在完全符合GMP标准的环境中为您实现定制化生产。



全程信赖，无缝衔接

Sunny Suite系列在流体输送与微流控混合技术上全程一致，确保从配方筛选→工艺开发→GMP生产的每个阶段都畅通无阻。无论您需筛选上百种配方，还是为临床试验生产升级规模的纳米颗粒，Sunny Suite系列始终是您值得托付的全面解决方案。



技术参数

应用	
通量	每个样品3–4分钟，一次96个配方
总流速范围	0.1–30 mL/min（视具体芯片而定）
典型的样品体积(3:1 FRR)	0.4–2 mL
最小输入体积（包含死体积）	≥105 μ L
连续制备模式	无
在线稀释模式	有
流速比（水相：有机相）	1:1 to 5:1
颗粒尺寸范围	40–200 nm*
PDI	<0.2*
包封率	>90%*
仪器	
物理参数	
重量和尺寸 (cm)	57公斤, 60高 x 90宽 x 40深
电源	
输入电压	100 V–240 V AC, 50–60 Hz
通讯方式	USB
其它信息	
样品环体积	2.5 mL
废液储存体积	4 x 1000 mL bottles
液体接触材料	PTFE, PCTFE, FEP, ETFE, PEEK, Polypropylene, FFKM, Hastelloy C276, Stainless Steel T316, Glass, Tygon (waste tubes), HDPE (waste container)
电脑配置	独立计算机, Win11操作系统, 带显示器, 键盘, 鼠标
耗材	
Sunnies微流控芯片	各种几何形状和通道尺寸的玻璃微流控混合芯片
可选型号	Sunny 490 Trident T, Sunny 100 X, Sunny 100 T, Sunny 190 X, Sunny 190 T, Sunny 275 X, Sunny 275 T, Sunny 150 3D, Sunny 50 Micromixer

* 视具体配方而定



非链（上海）贸易有限公司
上海市浦东新区张江路505号601室
联系电话：021-33780983
邮箱：info@unchainedlabs.com

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