Evidence Review of LabTIE Dispensers in Published Assays

Executive summary

The published evidence base for LabTIE dispensers is real but uneven across the three product families. The **LabTIE Seed Dispenser** has the clearest recurring application pattern in the literature: it is repeatedly used in **miniaturised teff seed germination assays for herbicidal discovery**, largely within natural-products discovery papers from the same Australian screening ecosystem. I identified **at least nine peer-reviewed papers** that explicitly state use of a LabTIE seed dispenser in this assay format, with highly similar methods: **10–15 *Eragrostis tef* seeds** dispensed into **96-well microtitre plates** containing **200 µL of 1% agar** and incubated for **72 h at 24 °C** under light. Across the sources I found, this is by far the dominant validated Seed Dispenser use case. [1]

The **LabTIE Bead Dispenser** has the broadest application range. I identified peer-reviewed papers, protocols, and preprints using it in **DNA/RNA extraction and sample homogenisation workflows**, **microbiome extraction pipelines**, **proteomics interactome sample preparation**, **rat RRBS DNA methylation workflows**, **fungal high-throughput culture/DNA isolation**, **house-fly genotyping sample prep**, **amyloid-β membrane-interface high-throughput screening**, and **FTIR high-throughput fungal phenotyping**. The strongest evidence cluster is nucleic-acid extraction/sample-prep in 96-well or matrix-tube formats. Representative sources include *Biochemistry* 2020, *Nature* 2023, *STAR Protocols* 2024, *mSystems* 2024, *Plants* 2025, *Current Protocols* 2025, *Microbiology Spectrum* 2025, and *Microbial Cell Factories* 2025, plus several preprints. [2]

The **LabTIE Powder Dispenser** has the weakest independent evidence base. I found **one clear peer-reviewed paper** explicitly using a custom/tailored **96-well LabTIE powder dispenser** in a production workflow: high-throughput DNA preparation from mycobacteria and other difficult cells, where the dispenser was used to load fine grinding material into a 96-well format. The official MolGen/LabTIE documentation gives substantially broader claims for powder handling, but independent assay-specific validation in the literature appears sparse. [3]

Across all three dispenser families, **official product literature is richer than independent benchmarking**. MolGen/LabTIE brochures state typical accuracy claims of **<2% error** for Seed and **<1% error** for Bead and Powder, compatibility with **24/45/48/96/384** grid formats, and nominal dispensing times around **30 seconds**, but peer-reviewed papers rarely

quantify the dispenser's own CV or error directly. In other words, the literature validates that the devices are being used successfully in real workflows, but **not usually via formal head-to-head performance studies of the dispensers themselves**. [4]

Scope and evidence base

This review focused on sources that explicitly report use of a LabTIE dispenser or a directly branded variant such as the **LabTie Gravity Bead Loader**. The evidence base compiled here includes **peer-reviewed journal articles**, **peer-reviewed protocols**, **preprints**, and **manufacturer/official product pages, brochures, and documentation**. Priority was given to PubMed/PMC-indexed records where available, publisher pages, and official MolGen/LabTIE pages. [5]

I did **not** find strong evidence for broad use of the Powder Dispenser across many assay classes, and I did **not** find assay-specific official application notes with deep experimental data beyond product brochures and general documentation pages. Likewise, I did **not** identify a patent set clearly tied to the Seed, Bead, or Powder dispensers themselves in the reviewed sources; that should therefore be treated as an **open search gap rather than a confirmed absence**. The literature footprint is clearly strongest for **Seed = herbicidal teff germination** and **Bead = homogenisation/extraction/sample prep**. [6]

The official specification baseline used throughout the report is as follows. The **Seed Dispenser** is marketed for seeds **0.2–9.0 mm**, with a stated **<2% error rate** and compatibility with plates, tubes, petri dishes, and trays. The **Bead Dispenser** is marketed for beads **0.3–6.0 mm**, with a stated **<1% error rate**. The **Powder Dispenser** is marketed for **5–1000 µL** powder volumes, also with a stated **<1% error rate**; MolGen further notes that the Powder Dispenser can be used for **beads smaller than 0.3 mm**, which helps explain why a "powder" device appears in at least one grinding-bead workflow. [7]

Cross-dispenser findings

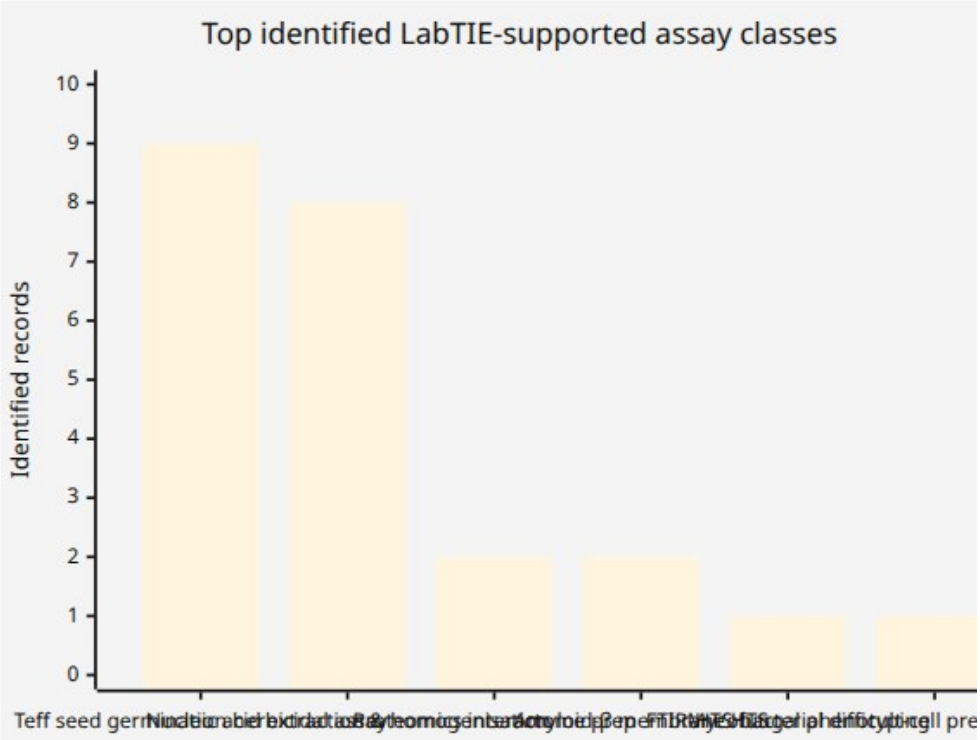
The evidence points to a simple pattern. The Seed Dispenser is validated mainly in **plant/weed-herbicide screening**, the Bead Dispenser in **sample disruption and extraction-heavy laboratory workflows**, and the Powder Dispenser in **a narrow but credible 96-well sample-prep niche**. The Bead Dispenser therefore has the broadest real-world assay diversity; the Seed Dispenser has the most concentrated and repeatable assay identity; the Powder Dispenser currently has the least independent literature support. [8]

Dispenser type	Best-supported assay classes	Typical materials / size range	Typical format / throughput	Accuracy / CV evidence	Compatible containers / materials	Approximate publication footprint in identified sources
Seed	Teff seed germination assay for herbicidal discovery; more generally marketed for germination, toxicology, quality, resistance and coating tests	Officially **0.2–9.0 mm** seeds; literature repeatedly uses **10–15 teff seeds/well**	Officially **24/45/48/96/384** grids; brochure says about **30 s** per dispensing cycle	Official marketing claim: **<2% error**; I found **no peer-reviewed study** directly reporting dispenser CV	Plates, tubes, vials, petri dishes, trays; official pages say **100+ / 120+ seed types** depending on page version	**At least 9 peer-reviewed papers** explicitly identified, overwhelmingly one assay family [9]
Bead	DNA extraction, microbiome extraction, plant genotyping	Officially **0.3–6.0 mm**; literature examples include **0.5**	Officially **24/45/48/96/384** grids; brochure says about **30 s**;	Official marketing claim: **<1% error**; peer-reviewed papers	Plates, tubes, vials, deep-well plates, matrix tubes	**At least 8 peer-reviewed papers/protocols** plus **4 prepri**

Dispenser type	Best-supported assay classes	Typical materials / size range	Typical format / throughput	Accuracy / CV evidence	Compatible containers / materials	Approximate publication footprint in identified sources
	sample prep, fungal DNA isolation, RRBS prep, proteomics AP-MS prep, amyloid HTS support, FTIR-HTS	**mm glass beads**, **2.8 mm ceramic beads**, **3 mm tungsten beads**, mixed **0.1/0.5/1 mm zirconia-silica**, and **710–1180 µm** acid-washed beads	many peer-reviewed uses are **96-well** or **matrix tube** formats	validate workflow use but usually **do not report direct dispenser CV**		**nts** explicitly identified [10]
Powder	High-throughput difficult-cell DNA extraction;	Officially **5–1000 µL** powder volumes; can handle	Officially **24/45/48/96/384** grids; brochure says	Official marketing claim: **<1% error**; no indepe	Plates, tubes, vials, deep-well plates	**1 clear peer-reviewed workflow** explicit

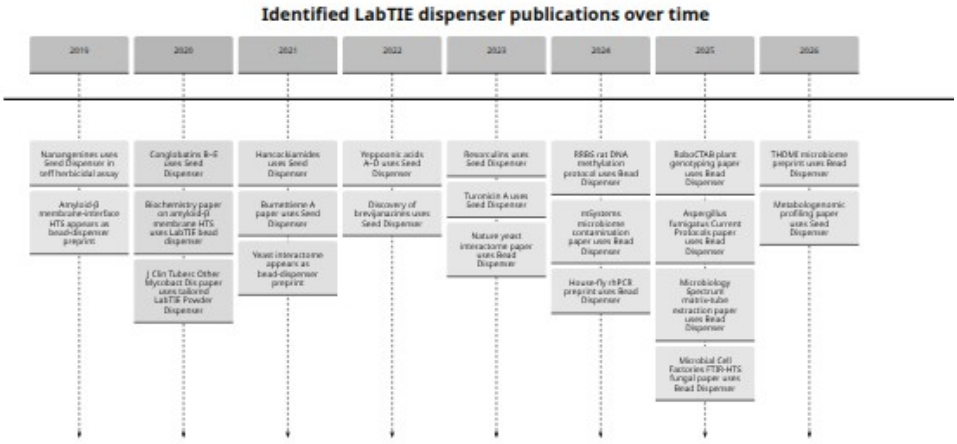
Dispenser type	Best-supported assay classes	Typical materials / size range	Typical format / throughput	Accuracy / CV evidence	Compatible containers / materials	Approximate publication footprint in identified sources
	otherwise mainly official/ marketing positioning for powder dosing	fine particulate material and is recommended by MolGen for **beads <0.3 mm**	about **30 s**	ndent assay-series benchmarking found		ly identified; broader claims mostly official/ manufacturer sources [11]

Top assays by identified publication count



The counts above are based on the explicitly identified records in this review, combining peer-reviewed papers, peer-reviewed protocols, and preprints where the device was stated in the methods. They should be read as **minimum located counts**, not as a claim that no further records exist. [12]

Timeline of identified publications



LabTIE Seed Dispenser

The Seed Dispenser literature is unusually concentrated around one experimental task: **high-throughput seed germination as a phenotypic herbicidal screen**. In the papers I identified, the assay design is essentially consistent: **10–15 teff seeds** are dispensed into a **96-well microtitre plate** containing **200 µL of agar (1% w/v)** with test compound, the plate is wrapped in a semi-opaque bag, exposed to approximately **1600 lux**, and incubated for **72 h at 24 °C** before visually assessing germination inhibition. This repeated method appears in at least nine peer-reviewed papers. [1]

Assays identified and publication frequency

Rank	Assay / application	Identified publications	Notes
Highest	**Teff seed germination assay for herbicidal discovery**	**9**	Dominant use case; same Phytox-style screening logic repeated across multiple natural-product discovery papers [1]
Evidence	Other seed	**0 located**	Official/

Rank	Assay / application	Identified publications	Notes
gap	assays explicitly demonstrated in publications		product literature mentions broad seed-testing suitability, but I did not find peer-reviewed papers explicitly documenting those other seed assay classes with a LabTIE seed dispenser [13]

Representative publications, methods, and what the device did

Publication	Assay	How the Seed Dispenser was used	Methods details and any performance data
Lacey HJ et al. *Nanangenines : drimane sesquiterpenoids as the dominant metabolite cohort of a novel Australian fungus, Aspergillus nanangensis.* **Beilstein J Org Chem. 2019;15:2631–2643.** DOI: **10.3762/bjoc.15.256** [14]	Herbicidal screen	Used to dispense teff seeds into 96-well plates for a Phytox herbicidal assay. [15]	**10–15 teff seeds/well**, **200 µL 1% agar**, **72 h**, **24 °C**, **1600 lux**; no dispenser-specific CV reported. [15]

Publication	Assay	How the Seed Dispenser was used	Methods details and any performance data
Lacey HJ et al. *Conglobatins B–E: cytotoxic analogues of the C2-symmetric macrodiolide conglobatin.* **J Antibiot. 2020;73:756–765.** DOI: **10.1038/s41429-020-0332-?** PubMed confirms the article and year/journal; the DOI suffix is truncated in the accessible snippet, so the article link below should be treated as the reliable source link. [16]	Herbicidal screen	Same teff germination workflow; the device standardised seed loading into 96-well wells containing agar and compounds. [17]	Again **10–15 teff seeds/well** in **200 µL agar**; publication reports biological assay results, not dispenser accuracy. [17]
Li H et al. *Hancockiamides: phenylpropanoid piperazines from Aspergillus hancockii are biosynthesised by a*	Herbicidal screen	Used LabTIE seed dispensing for the recurrent teff herbicidal miniaturised screen. [19]	Same 96-well Phytox conditions; no dispenser fidelity metrics reported. [19]

Publication	Assay	How the Seed Dispenser was used	Methods details and any performance data
versatile dual single-module NRPS pathway. **Org Biomol Chem. 2021;19:587–595.** DOI: **10.1039/D0OB02243H** [18]			
Roux I et al. *Characterisation and heterologous biosynthesis of burnettiene A, a new polyene-decalin polyketide from Aspergillus burnettii.* **Org Biomol Chem. 2021;19:9506–9513.** DOI: **10.1039/D1OB01766G** [20]	Herbicidal screen	Supplementary methods show the same LabTIE-based teff dispensing into microplates. [21]	Methods match the common teff-screen template; again no direct seed-dispensing error data. [21]
Lacey H et al. *Yeppoonic acids A–D: 1,2,4-trisubstituted arene carboxylic acid co-metabolites of*	Herbicidal screen	Used in the same miniaturised teff germination format. [23]	**10–15 seeds/well**, **96-well**, **200 µL agar**; readout is inhibition of germination. [23]

Publication	Assay	How the Seed Dispenser was used	Methods details and any performance data
conglobatin from an Australian Streptomyces sp. **J Antibiot. 2022;75:108–112.** DOI: **10.1038/s41429-021-00493-4** [22]			
Li H et al. *Discovery of brevijanazines from Aspergillus brevijanus reveals the molecular basis for p-nitrobenzoic acid in fungi.* **Chem Commun. 2022;58:6296–6299.** DOI: **10.1039/D2CC01679F** [24]	Herbicidal screen	Supplementary methods again specify teff loaded with a LabTIE seed dispenser. [25]	Same common protocol; no device-specific performance metrics. [25]
Lacey HJ et al. *Resorculins: hybrid polyketide macrolides from Streptomyces sp. MST-91080.* **Org Biomol Chem.**	Herbicidal screen	Used teff seed loading for the herbicidal discovery panel embedded in the paper's screening pipeline. [27]	Same plate-based method; no dispenser-specific CV/accuracy reported. [27]

Publication	Assay	How the Seed Dispenser was used	Methods details and any performance data
2023;21:2531–2538. DOI: **10.1039/D2OB02332F** [26]			
Chen R et al. *Turonicin A, an antifungal linear polyene polyketide from an Australian Streptomyces sp.* **J Nat Prod. 2023.** DOI: **10.1021/acs.jnatprod.3c00144** [28]	Herbicidal screen	ACS page snippet confirms teff seeds were dispensed using a LabTIE seed dispenser in the methods. [29]	Reuses the same herbicidal teff assay architecture; no direct device metrics. [29]
Arishi AA et al. *Metabologenomic profiling of the endemic Australian …* **Aust J Chem / Taylor & Francis page, 2026.** DOI and full title available via publisher page. [30]	Herbicidal screen	Publisher snippet states that **10–15 teff seeds** were delivered into each well using a LabTIE seed dispenser. [30]	Same miniaturised 96-well seed assay family; full methods not extracted here. [30]

Protocol and material details

The official Seed Dispenser brochure states compatibility with **96-well microtiter, cell-culture and deep-well plates**, **384-well plates**, **24-well and 48-well plates**, **snap-cube, screw-cap and cryo tubes**, **GC vials**,

petri dishes, and **soil/germination trays**. It gives a seed size range of **0.2–9.0 mm**, claims **single-seed per well** capability, and markets the system as dispensing in **30 seconds** with **<2% error rate**. Official product pages add that the platform supports **over 100** or **more than 120** seed types, depending on the page version. [31]

In the peer-reviewed seed-assay literature, however, the actual published use is much narrower: almost everything I found is the same **teff-on-agar 96-well herbicidal assay**. That makes the Seed Dispenser well validated for this one workflow, but not yet broadly validated in the literature for the rest of the official menu of potential seed applications. [32]

Limitations and issues

A notable limitation is that I found **no peer-reviewed paper directly quantifying Seed Dispenser accuracy, CV, carryover, or contamination**, even though the brochures make explicit error-rate claims. The literature validates workflow utility, not metrological performance of the instrument itself. [33]

A second limitation is assay diversity. The evidence base is heavily dominated by a **single screening platform** and apparently a **single model seed**. That is useful commercially, because it shows repeat adoption in a demanding 96-well assay, but it also means the independent literature does **not yet demonstrate broad assay coverage** across the many seed-testing applications that the manufacturer lists. [34]

LabTIE Bead Dispenser

The Bead Dispenser has the strongest and most diverse evidence base. It appears in workflows for **cell lysis**, **tissue homogenisation**, **DNA extraction**, **RRBS DNA methylation library prep**, **microbiome sample processing**, **proteomics interactome mapping**, **fungal phenotyping by FTIR-HTS**, and **screening/genotyping sample prep**. Most implementations are in **96-well** or **matrix-tube** formats, which fits the product's official positioning as a high-throughput manual solid-dispensing tool. [35]

Assays identified and publication frequency

Rank	Assay / application	Identified records	Notes
Highest	**Nucleic-acid extraction / homogenisation / sample prep**	**8**	Includes RRBS, plant genotyping, microbiome DNA extraction,

Rank	Assay / application	Identified records	Notes
			fungal DNA isolation, and related workflows across papers/protocols/preprints [36]
Second	**Proteomics interactome sample preparation**	**2**	One bioRxiv preprint and one final *Nature* paper [37]
Second	**Amyloid-β membrane-interface high-throughput screening**	**2**	One bioRxiv preprint and one final *Biochemistry* paper [38]
Additional	**FTIR high-throughput fungal phenotyping / biomass homogenisation**	**1**	Microbial Cell Factories 2025 [39]

Representative publications, methods, and what the device did

Publication	Assay	How the Bead Dispenser was used	Methods details and any performance data
Cox SJ et al. *High-Throughput Screening at the Membrane Interface Reveals Inhibitors of Amyloid-β.* **Biochemistry. 2020;59(24):2249–2258.** DOI: **10.1021/acs.biochem.0c00328**; preprint DOI **10.1101/853499** [40]	Membrane-interface HTS	Each well received a **single 0.5 mm sterile glass bead** using a custom-made LabTIE bead dispenser to support lipid-film preparation / membrane-interface screening. [41]	Evidence shows successful use in a **1,800-compound** screen, but no dispenser-specific CV was reported. [38]
Michaelis AC et al. *The social and structural architecture of the yeast protein interactome.* **Nature. 2023;624(7990):192–200.** DOI: **10.1038/s41586-023-06739-5**; preprint DOI **10.1101/2021.10.24.465633** [42]	Proteomics / AP-MS sample prep	A **96-well bead dispenser** loaded **100 µL of 0.5 mm acid-washed glass beads** per well before deep-well bead beating for yeast lysate preparation in a highly scaled interactome pipeline. [43]	Plates were bead-beaten for **4 cycles of 1.5 min at 1,750 rpm**, with cooling between rounds. The paper validates the workflow, not the dispenser as an instrument. [44]

Publication	Assay	How the Bead Dispenser was used	Methods details and any performance data
Nair VD et al. *Protocol for high-throughput DNA methylation profiling in rat tissues using automated reduced representatio n bisulfite sequencing.* **STAR Protocols. 2024;5(2):10 3007.** DOI: **10.1016/j.xp ro.2024.103 007**; PMID **38691461** [45]	Automated RRBS / DNA methylation	Uses **LabTie "Gravity" bead loader**, 96-well bead dispenser format, with **2.8 mm ceramic beads** to load Micronic tubes for rat tissue DNA extraction prior to RRBS. [46]	Strong protocol-level evidence for routine, automated use; no direct dispenser accuracy statistics reported. [47]
Brennan C et al. *Clearing the plate: a strategic approach to mitigate well-to-well contamination in large-scale microbiome studies.* **mSystems. 2024;9(10):e 00985-24.** DOI: **10.1128/msy stems.00985 -24**; PMID	Microbiome extraction / contamination reduction	Added **30 µL** of **0.1, 0.5 and 1 mm zirconia-silica beads** to each matrix tube using the LabTie bead dispenser as part of a matrix-tube extraction workflow. [49]	This paper is important because it reports a **system-level benefit**: far fewer contaminated blanks in the matrix-tube method than the plate-based approach. The benefit cannot be attributed solely to the dispenser, but

Publication	Assay	How the Bead Dispenser was used	Methods details and any performance data
39283083 [48]			the dispenser is an integral part of the workflow. [50]
Boucher St-Amour V-T et al. *High-Throughput DNA Extraction Using Robotic Automation (RoboCTAB) for Large-Scale Genotyping.* **Plants. 2025;14(15): 2263.** DOI: **10.3390/plants14152263** ; PMID **40805612** [51]	Plant genotyping DNA extraction	For each sample, a **3 mm tungsten grinding bead** was dispensed into each well with a **LabTie Gravity Bead Loader** before robotic TE addition and tissue grinding. [52]	Tissue disruption was achieved after **four 60 s cycles at 24 oscillations/s**. The authors also note that pre-adding **50 µL TE** helped address **electrostatic effects and powder volatility** during grinding. That is one of the clearest practical "issue + mitigation" examples in the literature. [53]
Reyes Márquez FC et al. *High-Throughput Culture and DNA Isolation Methods for Aspergillus fumigatus.* **Current Protocols.**	Fungal culture / DNA isolation	Methods/ resources list a **Lab TIE bead dispenser compatible with 96-well plates**, specifically catalog **BSP-LT-96-2-1-40**	Strong protocol evidence that the Bead Dispenser is embedded in a reproducible fungal DNA-isolation workflow, though the

Publication	Assay	How the Bead Dispenser was used	Methods details and any performance data
2025;5(4):e70112. DOI: **10.1002/cpz1.70112**; PMID **40172288** [54]		or similar. [55]	snippet does not expose the full bead-loading step detail. [56]
Brennan C et al. *Streamlined extraction of nucleic acids and metabolites from low- and high-biomass samples using isopropanol and matrix tubes.* **Microbiology Spectrum. 2025.** DOI: **10.1128/spectrum.01912-25**; PMID **41070991** [57]	DNA + metabolite co-extraction	Added **30 µL** of mixed-size **0.1, 0.5 and 1 mm zirconia-silica beads** to each matrix tube with a LabTie bead dispenser. [58]	The method halves processing complexity relative to plate-based workflows and supports both metabolomics and metagenomics/16S workflows. Again, this is a workflow benefit rather than a direct dispenser benchmark. [59]
Bolaño-Losada C et al. *Effect of hydrogen peroxide and carbon-to-nitrogen ratio on growth and biochemical profile in oleaginous mucoromycot*	FTIR-HTS fungal phenotyping	Added **250 mg acid-washed beads (710–1180 µm)** to each well **with the help of a LAbTIE bead dispenser** before bead beating and	Bead beating used **3 cycles of 3.5 min at 25 Hz** with 30 s rests. This is the clearest published example of the dispenser being used for **non-nucleic-acid** high-

Publication	Assay	How the Bead Dispenser was used	Methods details and any performance data
a. **Microbial Cell Factories. 2025;24:232.** DOI: **10.1186/s12934-025-02863-1** [60]		FTIR-HTS acquisition. [61]	throughput biochemical phenotyping. [62]
Estep AS et al. *Rapid and cost-effective screening of genetic markers associated with pyrethroid resistance in Musca domestica using RNAse H2 PCR (rhPCR).* **Preprint. 2024.** DOI: **10.21203/rs.3.rs-5239153/v1** [63]	Insect genotyping sample prep	Loaded **2.0 mm cubic zirconium beads** into a **96-deep-well homogenisation plate** using a LabTie bead dispenser before rhPCR workflow setup. [64]	Useful evidence of entomology/genotyping adoption, but still a preprint. [65]

Protocol and material details

Official LabTIE and MolGen sources describe the Bead Dispenser as handling beads from **0.3 to 6.0 mm**, compatible with **24/45/48/50/96/100/384**-style grids depending on page version, and usable with **plates, tubes and vials**. The 2021 MolGen brochure states **<1% error**, **30-second** dispensing, and exchangeable mesh plates; the official LabTIE product page highlights widespread use for **DNA extraction** and **bead beating** and shows direct 96-well and vial configurations. [66]

The peer-reviewed literature closely matches those claims. Published bead sizes include **0.5 mm glass beads** in proteomics and amyloid work, **2.8 mm ceramic beads** in RRBS DNA methylation, **3 mm tungsten beads** in plant genotyping, mixed **0.1/0.5/1 mm zirconia-silica beads** in microbiome extraction, and **710–1180 µm acid-washed beads** in FTIR microbial phenotyping. That breadth is exactly what one would expect from a genuinely modular bead-loading platform. [67]

Limitations and issues

The Bead Dispenser's main limitation in the literature is not lack of use, but lack of **direct metrology**. Peer-reviewed papers usually report that the tool was used successfully, then move on to biological outcomes. Very few give **per-well bead-count precision**, **CV**, or direct **head-to-head comparisons** against manual loading. The best quantitative performance claims still come from manufacturer literature, not the independent papers. [68]

A practical issue that does appear in the literature is **electrostatic behaviour and volatility around dry plant tissue grinding**. In RoboCTAB, the authors explicitly mitigated this by pre-dispensing **50 µL TE buffer** with a robot before grinding. Another key issue at the workflow level is **cross-contamination in plate-based microbiome extractions**; the Brennan papers indicate that the matrix-tube workflow that includes LabTie bead dispensing can materially reduce blank contamination and simplify metadata handling. [69]

LabTIE Powder Dispenser

The Powder Dispenser is the least well represented in the independent literature. The clearest peer-reviewed use I found is **a custom/tailored 96-well LabTIE powder dispenser** used in a high-throughput DNA-extraction protocol for mycobacteria and other difficult cells. In practice, the material being dispensed in that use case behaves like a fine granular grinding medium rather than a coarse bead, which is consistent with MolGen's own positioning that the Powder Dispenser can also be used for material below the lower bead-size range. [70]

Assays identified and publication frequency

Rank	Assay / application	Identified publications	Notes
Highest and only clearly verified peer-reviewed use	**High-throughput DNA extraction from mycobacteri**	**1**	Clear, direct, peer-reviewed use of a tailored LabTIE powder

Rank	Assay / application	Identified publications	Notes
	a and other challenging cells		dispenser in 96-well format [71]
Evidence gap	Other powder-dosing assays in independent literature	**0 clearly verified beyond this review set**	Official pages describe wide use, but I did not find a broader peer-reviewed assay set explicitly naming the Powder Dispenser [72]

Representative publication, methods, and what the device did

Publication	Assay	How the Powder Dispenser was used	Methods details and any performance data
Epperson LE, Strong M. *A scalable, efficient, and safe method to prepare high quality DNA from mycobacteria and other challenging cells.* **J Clin Tuberc Other Mycobact Dis. 2020;19:100150.** DOI: **10.1016/j.jctube.2020.100150** [73]	Difficult-cell DNA extraction	The authors state that for the **96-well format** they use a **96-well powder dispenser tailored for us by LabTIE**. [74]	The workflow yields high-quality DNA from up to **96 samples in about 2–3 h hands-on time** and explicitly notes that the tailored dispenser removes a laborious loading step. The paper validates the workflow, but does not publish dispenser-

Publication	Assay	How the Powder Dispenser was used	Methods details and any performance data
			specific CV or accuracy data. [75]

Protocol and material details

Official MolGen documents state that the Powder Dispenser handles **5–1000 µL** powder volumes, offers **exchangeable mesh plates**, supports **24/45/48/96/384** grids, and works with **plates, tubes and vials**. They also claim **<1% error** and **30-second** dispensing. On the product page, MolGen additionally states that the Powder Dispenser can be used to dispense **beads smaller than 0.3 mm**, which fits the Epperson use case conceptually. [76]

The independent literature does **not** yet show the same breadth as the official marketing position. I found no strong peer-reviewed trail for ELISA reagents, compound-dosing campaigns, or broad pharmaceutical powder-dosing studies explicitly naming the LabTIE Powder Dispenser. The literature therefore supports a **credible but narrow validation story** rather than a wide assay map. [77]

Limitations and issues

The main limitation is evidence depth. I found one strong peer-reviewed example, but **not a broad independent body of validation papers**. That means webpage copy for the Powder Dispenser should remain accurate and confident, but should **not imply the same volume of assay-specific publication support** that exists for the Seed or Bead lines. [78]

A second limitation is that official literature provides the only accessible quantitative performance claims I found for the Powder Dispenser itself. As with the other product families, the peer-reviewed paper demonstrates usefulness in a real workflow, but **not direct instrument benchmarking**. [79]

Webpage-ready text

LabTIE Seed Dispenser

The **LabTIE Seed Dispenser** is the strongest-published solution in the LabTIE range for **high-throughput seed phenotyping in microplate formats**. The clearest evidence comes from a recurring herbicidal-discovery workflow in which the dispenser is used to deliver **10–15 teff seeds per**

well into **96-well microtitre plates** containing agar and test compounds, enabling rapid, standardised germination readouts across many conditions. This exact format has been reported repeatedly in peer-reviewed natural-products papers, including **Lacey et al. (2019)**, **Li et al. (2021)**, and **Lacey et al. (2023)**. [80]

Official LabTIE/MolGen documentation describes the Seed Dispenser as compatible with **0.2–9.0 mm seeds**, multiple grid formats from **24 to 384**, and a wide range of containers including plates, tubes, petri dishes and trays. In practice, the publication record shows that researchers value it most where **repeatable, plate-based seed loading** matters: miniaturised germination assays, screening campaigns, and workflows where manual loading would otherwise become the bottleneck. [13]

For a webpage, the most defensible message is this: the LabTIE Seed Dispenser is **not just a convenience tool**; it is a **published, repeatedly adopted enabler of high-throughput herbicidal seed screening**, with real-world validation in peer-reviewed workflows. Representative sources include **Nanangenines** (Lacey et al., 2019), **Hancockiamides** (Li et al., 2021), and **Resorculins** (Lacey et al., 2023). [80]

LabTIE Bead Dispenser

The **LabTIE Bead Dispenser** has the broadest publication footprint in the LabTIE portfolio and is the most clearly validated for **high-throughput sample preparation**. Across peer-reviewed papers and protocols, it has been used to load grinding and lysis beads into **96-well plates**, **deep-well plates**, and **matrix tubes** for workflows spanning **DNA extraction**, **microbiome sample processing**, **RRBS DNA methylation library preparation**, **plant genotyping**, **fungal DNA isolation**, **proteomics interactome mapping**, and even **membrane-interface amyloid-β screening**. Representative examples include **Cox et al. (2020)**, **Michaelis et al. (2023)**, and **Boucher St-Amour et al. (2025)**. [81]

What stands out in the literature is not a single niche, but consistent integration into demanding workflows where **speed, repeatability and format alignment** matter. Published methods report successful loading of **0.5 mm glass beads**, **2.8 mm ceramic beads**, **3 mm tungsten beads**, mixed **0.1/0.5/1 mm zirconia-silica bead sets**, and larger acid-washed bead preparations. The result is a strong validation story for laboratories running disruption, extraction and homogenisation at scale. [67]

For website copy, the most credible positioning is that the LabTIE Bead Dispenser is a **published workflow accelerator for high-throughput lysis and homogenisation**, with adoption in genomics, epigenomics, proteomics and microbiome research. Inline examples: **Cox et al., 2020**, **Michaelis et al., 2023**, **Brennan et al., 2024**. [82]

LabTIE Powder Dispenser

The **LabTIE Powder Dispenser** is designed for laboratories that need to transfer powders or very fine particulate material into microplate and vial formats **quickly, reproducibly and without the burden of manual weighing at every position**. Official MolGen/LabTIE documentation specifies a working range of **5–1000 µL**, supports multiple grid formats from **24 to 384**, and highlights use with plates, tubes and vials. [72]

The independent literature base is currently narrower than for the Seed and Bead dispensers, but it is still meaningful. In a peer-reviewed high-throughput DNA extraction workflow for mycobacteria and other difficult cells, **Epperson and Strong (2020)** explicitly report use of a **96-well powder dispenser tailored by LabTIE**, showing that the platform can remove a laborious loading step in a real production method. MolGen's own documentation also notes that the Powder Dispenser can be used for **very fine beads below the bead-dispenser range**, which makes it especially relevant for fine granular sample-preparation tasks. [83]

For a webpage, the strongest positioning is precision and workflow relief rather than overclaiming publication volume: the LabTIE Powder Dispenser is a **validated semi-automated solution for fine powder and small-particle loading in high-throughput sample-prep workflows**, with explicit literature support from **Epperson and Strong (2020)** and official validation from current MolGen/LabTIE product specifications. [78]

Open questions and limitations

The biggest gap is **publication completeness for the Powder Dispenser**. I found one clear peer-reviewed paper and strong official documentation, but far fewer independent papers than for Seed or Bead. That does not mean such uses do not exist; it means they were not surfaced clearly in the reviewed source set. [78]

A second limitation is **instrument-level benchmarking**. Peer-reviewed studies nearly always report biological outputs, extraction yields, or screening outcomes, but rarely report **per-well dispensing accuracy**, **coefficient of variation**, **carryover**, or **failure modes** of the dispensers themselves. The most explicit performance numbers I found are still the manufacturer's brochure claims. [84]

A third limitation is that the **Seed Dispenser evidence base is dominated by one assay family**. This is commercially useful because it shows repeat adoption in a demanding, miniaturised screening workflow, but it also means claims about many other seed-assay categories should be framed as **capabilities** rather than as **broadly published validations** unless you have additional internal customer case studies or unpublished application data to support them. [85]

If you use this report for external copy, the most defensible framing is:

- **Seed**: repeatedly published in **96-well teff germination herbicidal assays**.
- **Bead**: broadly published in **high-throughput extraction, homogenisation, proteomics and epigenomics sample-prep workflows**.
- **Powder**: independently published in **high-throughput difficult-cell DNA prep**, with broader application support coming mainly from official manufacturer documentation. [86]

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