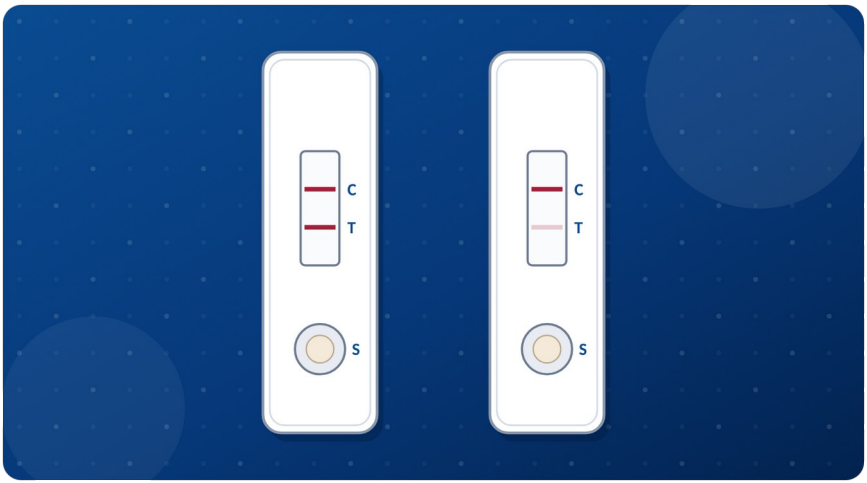


Capsaicin Lateral Flow Kit

Hot Sauces and Pepper Extracts · Laboratory Use

Catalog Number: **AU2046**

For Research Use Only. Not for use in Diagnostic Procedures.

1. Introduction

Attogene's Capsaicin Lateral Flow Kit is a rapid, single-use cassette test that screens hot sauces, pepper extracts and other liquid samples for capsaicin, the compound that makes chili peppers hot. Each sample is diluted, added to a cassette and read at 15 minutes, by eye or with a lateral flow reader, against a negative control cassette run at the same time. This version is made for the laboratory: the sample is diluted as needed in Sample Dilution/Running Buffer, 1–15 µL (usually 10 µL) is pipetted into a tube of the same buffer, mixed and added to a cassette.

The test is a competitive immunoassay (Figure 1). As the sample flows along the strip it picks up colloidal gold coated with a mouse monoclonal anti-capsaicin antibody. The test line (T) carries capsaicin bound to BSA. If the sample contains no capsaicin, the gold binds the test line and a red test line forms. Capsaicin in the sample fills the antibody binding sites, so less gold binds the test line: the more capsaicin in the sample, the weaker the test line. The control line (C), goat anti-mouse IgG, captures the gold that passes the test line and shows that the cassette ran correctly.

Important: a weaker test line means MORE capsaicin. Always read each sample against a negative control cassette run at the same time (Section 9).

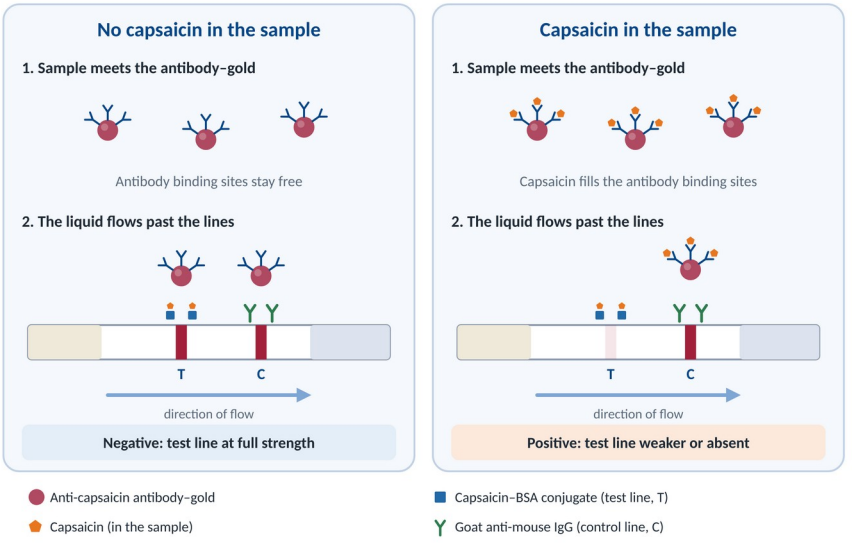


Figure 1. *Test principle. Left: with no capsaicin, the antibody–gold binds the capsaicin–BSA test line (T) and the excess binds the control line (C). Right: capsaicin in the sample blocks the antibody, so the test line is weaker or absent; the control line still forms.*

About capsaicin

Capsaicin and the closely related capsaicinoids, mainly dihydrocapsaicin, give chili peppers and hot sauces their heat. Heat is usually expressed in Scoville Heat Units (SHU). Pure capsaicin (1,000,000 ppm) rates about 16,000,000 SHU, so 1 ppm (1 mg/kg) of capsaicin corresponds to about 16 SHU; laboratories that report total capsaicinoids by HPLC often round this to 15. Most hot sauces contain far more capsaicin than the test responds to, so samples are diluted before testing (Section 7), and the result is converted back to the original sample with the dilution factor.

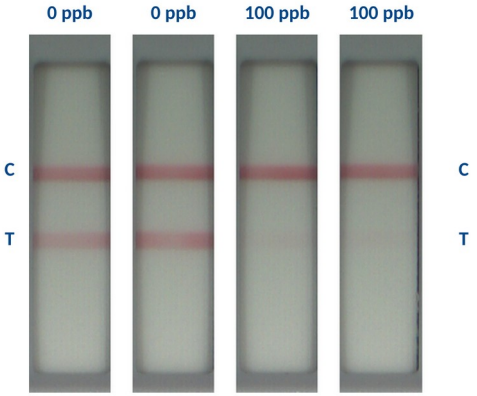


Figure 2. *Kit QC, lot 202609003 (9/3/2026): 150 µL of 1X Running Buffer with 0 or 100 ppb capsaicin, read at 15 minutes, in duplicate. At 0 ppb both lines are strong; at 100 ppb the test line is gone and the control line remains. The images are for illustration only; results may vary from batch to batch to some extent.*

Features & Benefits

- Screens for capsaicin from about 20 ppb by eye and about 10 ppb with a lateral flow reader, in the liquid added to the cassette; dilution brings concentrated samples into range.
- Results in 15 minutes.
- Every sample is read against its own negative control cassette.
- Simple pipetting procedure; 5 samples per kit, each with its own negative control.

2. Kit Contents

Component	Quantity	Storage
Capsaicin Cassette, in a foil pouch with desiccant	10	Room temperature
Sample Dilution/Running Buffer: 150 µL per tube	10 tubes	Room temperature
Sample Dilution/Running Buffer, 10 mL, for diluting samples	1 bottle	Room temperature
Transfer pipette, fixed volume, 75 µL	10	Room temperature
Manual	1	Room temperature

Kit size: 5 samples. Each sample uses two cassettes and two tubes of Sample Dilution/Running Buffer: one for the sample and one for its negative control. Each cassette is sealed in its own foil pouch with a desiccant.

3. Product Specifications

Key specifications for experienced users and for setting up a lateral flow reader. Concentrations are given in the liquid added to the cassette unless stated otherwise.

Parameter	Specification
Format	Single-use lateral flow cassette: sample port (S) and reading window, with C and T printed beside the window (Figure 3)
Assay principle	Competitive immunoassay: the test line weakens as capsaicin increases
Reporter	Colloidal gold conjugated to a mouse monoclonal anti-capsaicin antibody
Test line (T)	Capsaicin–BSA conjugate
Control line (C)	Goat anti-mouse IgG; captures gold that passes the test line
Analyte	Capsaicin
Samples	Hot sauces, pepper extracts and other liquid samples, diluted before testing
Screening level	By eye, the test line is visibly lighter than on the negative control from about 20 ppb; a lateral flow reader detects about 10 ppb
Upper level	Test line very faint or absent from about 100 ppb
Sample preparation	Dilute in Sample Dilution/Running Buffer as needed (Table 2); 1–15 µL (usually 10 µL) into one tube of Sample Dilution/Running Buffer (150 µL); mix 3 times
Volume to cassette	150 µL of the mixed sample (two full stems of the transfer pipette); 150 µL of Sample Dilution/Running Buffer for the negative control
Time to result	Read at 15 minutes
Controls	Negative control, one per sample: Sample Dilution/Running Buffer. No positive control (capsaicin standard) is supplied
Storage	All components at room temperature. Cassettes in their sealed foil pouches

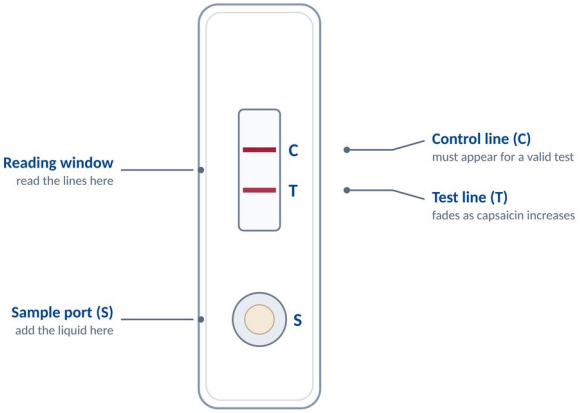


Figure 3. *Parts of the cassette. Add the liquid to the sample port (S) and read the lines through the window. The test line (T) is nearer the sample port than the control line (C).*

4. Storage and Stability

- Store the cassettes in their sealed foil pouches at room temperature. Open a pouch only when you are ready to run the test.
- Store the Sample Dilution/Running Buffer tubes and bottle capped, at room temperature.
- Use the kit before the expiration date on the label.

5. Required Materials Not Supplied

- **Timer** – to time the run
- **Disposable gloves** – for sample handling and testing
- **Permanent marker** – to label tubes and cassettes
- **Pipettors, 1–20 µL and 100–1000 µL, and tips** – to dilute the sample and to add it to the buffer tube
- **Microcentrifuge tubes, 1.5 mL** – for the sample dilutions
- **Capsaicin standard of known concentration (optional)** – as a positive control or to estimate concentration (Section 9)

6. Precautions

- For research use only. Not for use in diagnostic procedures. This kit gives screening results; confirm results used for any decision by an analytical method such as HPLC (Section 12).

- Before use, check that the date of use is before the expiration date on the label.
- Capsaicin irritates the skin, eyes and airways. Wear gloves when handling hot sauces and pepper extracts, do not touch your eyes or face, and wash your hands after testing.
- The buffers contain sodium azide (0.1% or less) as a preservative. Do not swallow; avoid contact with skin and eyes; if contact occurs, rinse with plenty of water.
- Use a new pipette tip or transfer pipette for each sample, each dilution and each negative control to avoid carrying capsaicin from one sample to the next.
- Use only reagents from one kit lot; the components of a lot have been adjusted to work together.
- Do not use a cassette from a damaged pouch. Use each cassette once.
- Lay each cassette flat on a level surface and do not move it while the sample runs.

7. Sample Preparation

- Shake or stir the sample well before taking an aliquot: capsaicin collects in oil and solids.
- If the sample contains seeds or pulp that block the pipette tip, let them settle for a few minutes and take the liquid from just below the surface.
- Bring the cassettes, the buffers and the samples to room temperature before testing.

Because most hot sauces contain far more capsaicin than the test range, dilute them before testing. The concentration in the original sample is the concentration in the cassette multiplied by the total dilution factor. Table 2 shows what each result means for the original sample at each dilution.

Dilution before the buffer tube	Total dilution	Positive from about	Strong positive from about
None (10 µL of sample added directly)	1:16	0.32 ppm (5 SHU)	1.6 ppm (26 SHU)
1:100 in Sample Dilution/Running Buffer	1:1,600	32 ppm (512 SHU)	160 ppm (2,560 SHU)
1:10,000 (two 1:100 steps)	1:160,000	3,200 ppm (51,200 SHU)	16,000 ppm (256,000 SHU)

Table 2. Capsaicin in the original sample that gives a positive (about 20 ppb in the cassette) or strong positive (about 100 ppb) result, with Scoville Heat Units at about 16 SHU per ppm. The total dilution includes 10 µL of sample in 150 µL of buffer (1:16). With another volume V (1–15 µL), the dilution in the tube is (150 + V) ÷ V.

Diluting a sample 1:100

1. Pipette 990 µL of Sample Dilution/Running Buffer from the 10 mL bottle into a labelled 1.5 mL tube.
2. Add 10 µL of the well-mixed sample. Cap and mix by inverting 10 times.
3. For a 1:10,000 dilution, repeat steps 1 and 2 with 10 µL of the 1:100 dilution and a new tip.

8. Procedure

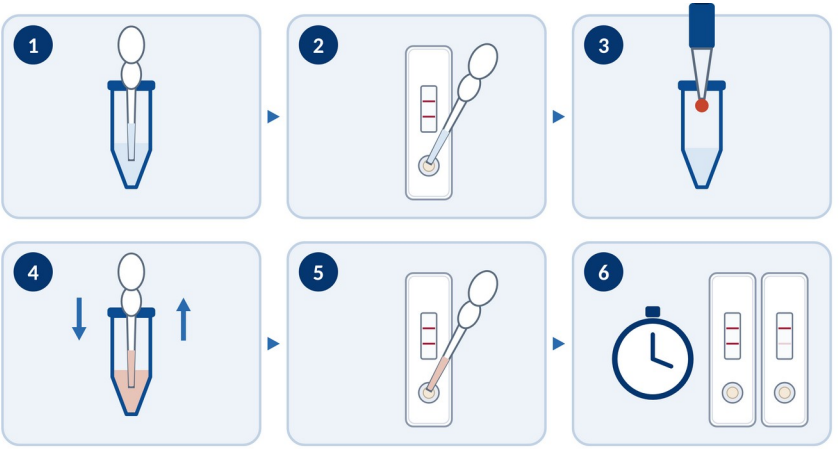


Figure 4. *Procedure overview. The panel numbers match the numbered steps below.*

Before you start

- Bring the cassettes, buffers and samples to room temperature.
- Each sample needs two cassettes (one for the negative control and one for the sample) and two tubes of Sample Dilution/Running Buffer.
- Tap each buffer tube on a hard surface so that the buffer collects at the bottom, then open it.
- Take the cassettes out of their pouches and lay them flat on a level surface. Label each cassette on the plastic (not on the window), for example “NC” and the sample name.

Using the transfer pipette: the pipette has two bulbs. Squeeze the top bulb, put the tip in the liquid and release the bulb slowly until the straight stem is full. That is 75 µL. Do not let liquid enter the lower (overflow) bulb. To dispense, squeeze the top bulb. 150 µL is two full stems.

A. Negative control

4. With a new transfer pipette, draw up the contents of one Sample Dilution/Running Buffer tube (two full stems, 150 µL).
5. Add the buffer to the sample port (S) of the negative control cassette. Start the timer. Discard the transfer pipette.

B. Sample

6. With a pipettor and a new tip, add 10 µL of the sample, or of its dilution (Section 7), to a new Sample Dilution/Running Buffer tube. Any volume from 1 to 15 µL can be used; Table 2 gives the dilution factor.
7. With a new transfer pipette, mix by drawing the liquid up and dispensing it back 3 times.
8. With the same transfer pipette, add two full stems (150 µL) of the mix to the sample port (S) of the sample cassette. Note the time.
9. Leave both cassettes flat and undisturbed. Read each cassette 15 minutes after its liquid was added (Section 9).

NOTE: read the sample cassette and its negative control cassette side by side at 15 minutes. Do not add any further liquid to the cassette after the sample.

9. Interpretation of Results

Read the sample cassette and its negative control cassette side by side. First check that both cassettes show a control line (C). Then compare the test line (T) of the sample with the test line of the negative control (Table 1 and Figure 5). Use Table 2 to convert the result to the original sample.

Result	What you see	Meaning (in the cassette)
Invalid	No control line (C) on the sample cassette or on the negative control cassette	The test did not run correctly. Repeat with new cassettes (Section 11).
Negative	T line as dark as, or darker than, the T line of the negative control	Capsaicin below about 20 ppb
Positive	T line visibly lighter than the T line of the negative control	Capsaicin at about 20 ppb or more
Strong positive	T line very faint or absent; C line present	Capsaicin at about 100 ppb or more. Dilute the sample further to estimate the level

Table 1. How to read the result by eye. The intensity of the control line varies between cassettes and does not affect the result, as long as a control line is visible.

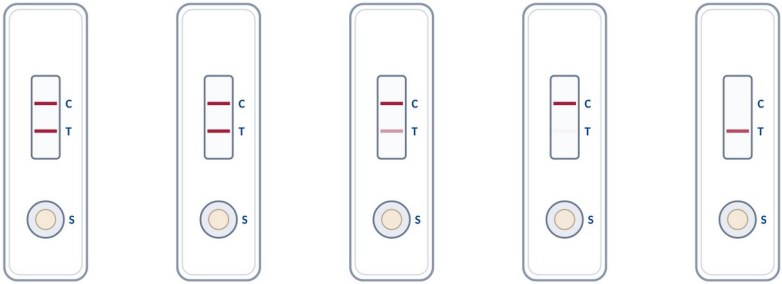


Figure 5. *Reading the result by eye, against the negative control (NC, left). Negative: T as dark as on the NC. Positive: T visibly lighter. Strong positive: T very faint or absent. Invalid (right): no C line.*

Reading with a lateral flow reader

Calculate T/C (test line value ÷ control line value) for the sample and for its negative control, and compare the two. A sample T/C at or below about 80% of the negative control T/C shows capsaicin at about 10 ppb or more in the cassette. In development data, T/C was 1.03 at 0 ppb, 0.82 at 10 ppb, 0.58 at 20 ppb, 0.30 at 40 ppb and 0.02 at 160 ppb; results may vary from batch to batch to some extent.

Approximate concentrations (semi-quantitative)

To estimate concentration, test a capsaicin standard of known concentration (not supplied), diluted in the same way as the samples, alongside the samples and compare the test lines; or test the sample at two or more dilutions and find the dilution at which the test line becomes lighter than the negative control. Do not compare with cassettes run earlier, because line intensities change as a cassette dries.

10. Limitations

- The test screens for capsaicin; it does not give an exact concentration or heat rating. Confirm results by an analytical method such as HPLC (Section 12).
- Cross-reactivity with dihydrocapsaicin and the other capsaicinoids has not been evaluated, so the result may not reflect the total heat of a sample.
- The Scoville values in Table 2 are estimates from the capsaicin concentration (about 16 SHU per ppm of capsaicin); they are not a sensory Scoville rating.
- Sauces with high levels of salt, vinegar, oil or solids have not been fully evaluated. Dilution reduces these effects; if in doubt, test a capsaicin-free sauce of the same type as a matrix control.

- Near the screening level the change in the test line is small. Read the sample and its negative control side by side under the same light, or use a lateral flow reader.

11. Troubleshooting

Observation	Likely cause	What to do
No control line	Too little liquid in the sample port, cassette moved or tilted during the run, or cassette exposed to moisture	Add 150 µL to the sample port; keep the cassette flat and still; use a new cassette from an undamaged pouch
Weak or no test line on the negative control	Capsaicin carried over from a sample, or cassette damaged or expired	Use a new tip and transfer pipette; check the expiration date; repeat with new cassettes. If it happens again, contact Attogene
No test line on the sample at every dilution	Sample above the range of the dilutions used	Dilute further (another 1:100 step in Sample Dilution/Running Buffer) and test again
Sample and negative control hard to compare	Cassettes read at different times or under different light	Read both cassettes side by side, under the same light, at 15 minutes, or use a lateral flow reader
Slow flow or liquid left in the port	Oil, pulp or seeds in the sample	Let solids settle, take the liquid from below the surface and dilute the sample further

12. Additional Analysis

If needed, confirm results with an analytical laboratory method for capsaicinoids, such as HPLC. A lateral flow reader can be used to obtain numerical (T/C) readings from the visual result. Contact us with any questions.

13. Ordering Information

Catalog no.	Description	Size
AU2046	Capsaicin Lateral Flow Kit, Laboratory Use: 10 cassettes, Sample Dilution/Running Buffer tubes and bottle, and transfer pipettes	5 samples
AU2046-01	Capsaicin Lateral Flow Kit, Field Use: 10 cassettes, 2X Sample Dilution Buffer tubes, 1X Dilution Buffer, Sample Dilution Tubes, a Fixed Volume Pipette and tips	5 samples

For bulk cassettes or custom formats, contact sales@attogene.com.

Contact Us

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Austin, TX 78744
Phone: 512-333-1330
Email: sales@attogene.com
Web: www.attogene.com

14. Quick Reference

Procedure at a glance

Step	Action
1	Negative control: one buffer tube (two full stems, 150 µL) into port S of the “NC” cassette. Start the timer.
2	Dilute the sample in Sample Dilution/Running Buffer if needed (Table 2).
3	Pipette 10 µL (1–15 µL) of the sample or its dilution into a new buffer tube.
4	Mix 3 times with a new transfer pipette.
5	Two full stems (150 µL) of the mix into port S of the sample cassette.
6	Read both cassettes side by side at 15 minutes.

Reading the result (always against the negative control)

Result	Sample cassette (concentration in the cassette)
Invalid	No C line on either cassette: repeat
Negative	T as dark as the NC T line: below about 20 ppb
Positive	T visibly lighter than the NC T line: about 20 ppb or more
Strong positive	T very faint or absent: about 100 ppb or more; dilute further
Reader	Sample T/C at or below about 80% of the NC T/C: about 10 ppb or more
Original sample	Multiply by the total dilution factor (Table 2)

Storage

- All components at room temperature; open a cassette pouch only when ready to test.

Notes

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