

One Direction or None

Mirror Molecules, the 2026 Nobel Prize in Chemistry and the Closure Rule of the Vacuum.Net

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1. The occasion

The 2026 Nobel Prize in Chemistry went to Henri Kagan and Kenso Soai. The subject is mirror molecules. Some molecules exist in two forms that are each other's mirror image, like a left and a right hand. The two forms have the same melting point, the same solubility and the same reactivity. Yet a living body treats them differently.

Life uses one form only. Proteins are built from left-handed amino acids. DNA and RNA are built on right-handed sugars. Chemistry in a flask makes both forms in equal amounts. The question has stood since Pasteur: how does one form win?

Kagan showed that the handedness of a catalyst steers the handedness of the product. Soai found a reaction in which the product is its own catalyst. A tiny surplus of one form grows to 99.99 per cent.

This essay places both results in the Vacuum.Net theory. The theory needs one rule. Everything below is counted from that rule and can be checked by hand.

2. The net and its one rule

The picture is a fishnet in water. One strand crosses itself. At each crossing it takes one of three states: +1, 0 or -1. One such sign is a trit.

Three neighbouring trits form a window. The window is **closed** when the three signs add to zero, counted modulo 3. An open window carries tension. A configuration persists only when its windows close.

Three trits have $3 \times 3 \times 3 = 27$ states. Go through them:

- Three equal signs: (+,+,+) sums to 3, (0,0,0) to 0, (-,-,-) to -3. All three are zero modulo 3. **Three closed windows.**
- Three different signs: $-1 + 0 + 1 = 0$. There are six orders. **Six closed windows.**
- Two equal and one different: the sum is never a multiple of 3. **Eighteen open windows.**

So 9 of 27 windows close. They come in two kinds: homogeneous (three equal) and heterogeneous (three different). The kinds do not mix. If two neighbours are equal, the third must be equal too. If two neighbours differ, the third must be the remaining sign.

A homogeneous ring is static. It is the form of a crystal. A heterogeneous ring keeps closing while every sign changes. It is the form of metabolism. This essay concerns the heterogeneous ring.

3. The mirror pair

Take a ring of three trits, all different. A ring has no starting point, so rotations count as one. Six orders divided by three rotations gives **two rings**:

- **Ring L:** $- \rightarrow 0 \rightarrow +$
- **Ring R:** $+ \rightarrow 0 \rightarrow -$

Mirror a ring by reversing every sign. Ring L becomes $(+, 0, -)$, which is ring R. The two rings are each other's mirror image.

Compare their content. Each holds one $-$, one 0 and one $+$. Nothing in the content tells them apart. Only the direction of travel differs.

This is the mirror molecule in the net. Same content, so the same properties when measured alone. Opposite direction, so a different fit with anything that has a direction of its own.

4. Why a mixed strand does not persist

In a heterogeneous strand, two signs fix the third:

$$t_3 = -(t_1 + t_2) \text{ modulo } 3.$$

Start with $-$, 0. The next sign is $+$. Then 0, $+$ gives $-$. Then $+$, $-$ gives 0. The strand reads $-$, 0, $+$, $-$, 0, $+$ and so on. The direction is set by the first two signs. It can never turn.

Now force a turn. Join ring L to ring R:

$-$, 0, $+$, $+$, 0, $-$

Check the four windows along the strand:

Window	Sum	State
$(-, 0, +)$	0	closed
$(0, +, +)$	2	open
$(+, +, 0)$	2	open
$(+, 0, -)$	0	closed

The two windows on the seam are open. Close the strand into a ring and the second seam opens as well. A strand that mixes directions carries tension at every seam.

The result is exact. **A heterogeneous strand has one direction or it does not close.** In chemistry this fact is called homochirality and is treated as a riddle. In the net it is the only closed form there is.

5. Kagan: the wall has a direction

A catalyst is a ring that fills a window together with the molecule being formed. Two signs of the window belong to the catalyst. One sign is free. With two signs fixed, exactly one value closes the window.

A catalyst with direction L therefore closes only with a product of direction L. The mirror product leaves the window open. It does not stay.

Kagan found a second effect. A catalyst that is not pure gives a purer product than expected. The net counts this directly. Take 60 catalyst rings of direction L and 40 of direction R. An L and an R that meet form a seam. The seam is open. Forty L rings lie against forty R rings and do nothing. Twenty L rings remain free. All the work is done by those twenty, and all of it has direction L.

A catalyst that is 60 per cent left gives a product that is close to 100 per cent left. The mixed pairs are not lost. They are parked at an open seam.

6. Soai: the ring that divides

A heterogeneous ring exists only at lengths that are multiples of three. Count the closed rings per depth:

Depth	Homogeneous closed	Heterogeneous closed
1	3	0
2	3	0
3	3	2
4	3	0
5	3	0
6	3	2

A ring of three cannot grow sign by sign. Depths 4 and 5 hold no heterogeneous ring. It grows by a whole triplet, to six. A ring of six can be cut into two rings of three. Both halves close. Both keep the direction of the parent.

$$3 \rightarrow 6 \rightarrow 3 + 3$$

This is Soai's reaction. The product takes up material, doubles and splits into two copies of itself. Each copy has the direction of the first. The product is its own wall.

Now count the growth. Start with 51 rings L and 49 rings R. The 49 rings R lie against 49 rings L at open seams. They do not divide. The surplus is 2 rings L. The surplus doubles each round.

Round	Rings L	Rings R	Share L
0	51	49	51.00 %

5	$49 + 64 = 113$	49	69.75 %
10	$49 + 2,048 = 2,097$	49	97.72 %
15	$49 + 65,536 = 65,585$	49	99.93 %
18	$49 + 524,288 = 524,337$	49	99.99 %

Eighteen doublings carry a surplus of two in a hundred to 99.99 per cent. That is the purity reported for Soai's reaction.

Which direction wins is not set by the rule. The rule is symmetric. It is set by what lay there first. The net keeps the orientation of what was first laid down. A surplus of one ring is enough.

7. Where the prize sits on the ladder

The count in section 6 places chemistry and life on one ladder.

- **Below depth 3** there is no heterogeneous closure. There is static order and there is tension passed on. That is chemistry.
- **At depth 3** a ring closes while its content changes. It has a direction. It cannot divide.
- **At depth 6** the ring divides and hands its direction on. That is the form of a cell.

Soai's reaction performs the step $3 \rightarrow 6 \rightarrow 3 + 3$ in a flask. There is no membrane and no cell. There is only a ring that divides and keeps its direction. The reaction sits exactly on the line where chemistry passes into life. The Nobel committee called it chemistry. On the ladder it is the first rung of heredity.

8. Medicines

A body is a strand with one direction. A molecule that enters it meets windows whose first two signs are already set.

A molecule of the same direction closes the window. It fits and it stays. Its mirror image leaves the window open. It then does one of three things. It passes without effect. It closes a different window elsewhere and acts as a different medicine. Or it holds a window open that should be closed, and does harm.

The record shows all three. Dextropropoxyphene was sold as the painkiller Darvon. Its mirror image, levopropoxyphene, was sold as the cough medicine Novrad. The trade names mirror each other, as the molecules do. Thalidomide is the third case: one direction calmed, the other damaged the unborn child.

For the making of medicines the consequence is plain. A flask without direction makes both rings in equal number. Half the product is then the wrong medicine. A wall with direction, or a seed ring of the right direction, makes one ring only. Kagan supplied the wall. Soai supplied the seed.

9. Status

Counted. 27 windows, 9 closed, 3 homogeneous and 6 heterogeneous. Two heterogeneous rings at depth 3, mirror images of each other. Open seams where directions meet. No heterogeneous ring at depths 4 and 5. Eighteen doublings from 51 per cent to 99.99 per cent.

Read. The two rings as the two mirror molecules. The catalyst as two fixed signs of a window. Soai's reaction as the division $3 \rightarrow 6 \rightarrow 3 + 3$. The body as a strand with one direction.

Open. Amino acids are left-handed and the sugars of DNA are right-handed. The net gives two directions and both are in use. Why the two systems run opposite is not yet derived. One reading is available. A window on the layer above may itself close heterogeneously: one system at $-$, one at $+$, and one at 0 , without handedness. Membrane lipids and the amino acid glycine have no handedness. Whether they hold the 0 is a count still to be made.

Annotated references

Frölke, S. (2026). "Een zuiver scheikundig spiegelbeeld leidt tot filosofische levensvragen. En tot een Nobelprijs." *NRC*, 7 October 2026. *Why read?* The occasion of this essay. It gives the prize, the two laureates and the link to the origin of life. *Reading advice:* the article pairs Darvon and Novrad with dextromethorphan; the pair is dextro- and levopropoxyphene.

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Knuth, D. E. (1997). *The Art of Computer Programming, Vol. 2*, §4.1. Reading: Addison-Wesley. *Why read?* Balanced ternary: three signs, and the mirror of a string as its negative. *Reading advice*: a few pages; do the examples by hand.