

Let There Be Light: 50 Years of Hedione^a

Master perfumers reflect on an R&D breakthrough



Olivier Cresp



Jacques Cavallier



Pierre-Alain Blanc



Alberto Morillas

Firmenich master perfumer Jacques Cavallier was just a child when he first encountered Hedione, which he calls “the first universal transparent note.” His father, also a perfumer, had come home with a sample intended for perfumer Edmond Roudnitska, whose breakthrough *Eau Sauvage* (Christian Dior) was powered by a 3% dose of the new ingredient. Cavallier’s father handed the boy a blotter, which he held up to his nose, declaring, “I smell nothing.” Cavallier’s father urged him, “Keep the blotter beside your bed and you will tell me more tomorrow.” Seated in Firmenich’s Paris creative center decades later, Cavallier recalls, “During the night, I was awoken by a smell. And in the morning, on the blotter was the beauty, the grace of a jasmine field in the morning—a jasmine that was greener, less animalic ... Hedione is a perfume itself.”

Today, due to its versatility, power and ever more affordable pricing, the ingredient is used at increasingly higher doses in fine fragrance and has been applied in all perfumery segments. On this, the ingredient’s 50th anniversary, *Perfumer & Flavorist* magazine sat down with a trio of Firmenich’s master perfumers to discuss this signature ingredient, its effects in classic fragrances, and its place in the continuing evolution of aroma molecule R&D.

Modern, Multifaceted

The story of Hedione began in 1957 when Firmenich researcher Edouard Demole identified methyl jasmonate as the heart of a jasmine flower fraction. He soon synthesized its dihydro derivative, methyl dihydrojasmonate, which was commercialized as Hedione, a name derived from the Greek word *hedone*, which is roughly translated as hedonism or pleasure. The first batch of 50 kg was produced in 1961, with ton batches created in the 1970s.

“Every day I discover another facet of Hedione,” says master perfumer Alberto Morillas, who has used the ingredient for 40 years and includes it in all of his formulations. “If you use it with fresh [accords] it becomes much more floral and transparent. When you use it with dark woody [scents] it becomes magical.” Morillas adds that Hedione has been responsible for making perfumery fresher and radiant, despite that—as Cavallier found—it has a remarkably subtle smell on its own. “When you add it to a perfume it becomes very different,” he says.

“For me it’s the most important molecule that a perfumer can use,” says Cavallier. “Hedione is [to perfumery] what oxygen is for humans—we cannot do without it. It carries the smell of flowers and the freshness of nature. You can use it with jasmine or tuberose, but you can also use it with a rose [scent]. Today I’m working on a patchouli accord with 40% Hedione. Without it, the patchouli is dark. It makes the ingredients alive from the

^aHedione is a trademark of Firmenich.

top note to the dry down. It's blooming. It keeps the floral freshness for hours and days. It makes the perfume dance ... without being heavy or aggressive. It reveals all of the parts of the fragrance."

"When I walk down the street, I smell perfume, of course—but immediately I smell the ingredients," says master perfumer Olivier Cresp. "When I smell Hedione, I think it's a Firmenich signature of R&D." He adds, "Hedione is a beautiful molecule. First, when you smell it, it's natural. Secondly, it reminds me of the bushes of jasmine blooming in July and August. It's jasminey and fruity. On top of that, it's extremely fresh, citrusy. When you smell lemon flowers or even bergamot flowers, you will notice that they smell citrusy on one side and on the other side, like Hedione."

Cresp explains that the ingredient's increasing affordability over time has allowed him and fellow perfumers to use it at higher and higher levels in formulations, bringing out new effects. "Today, in perfumery architecture we are more minimalist," he says. "We are working more simply. Instead of using 150–200 products [in a formula] we are using 20–30 ingredients. You use large amounts [of key ingredients]. Instead of using 1–3%, you use 20–40%. Maybe in coming years I will use 80% Hedione for a new generation of fragrance. Why not? Today we have to break the rules."

Formulating with Hedione

"When I started in this business 33 years ago we were using 1–2% Hedione in fragrances," says Cavallier, who uses the ingredient in masculine and feminine fragrances. Echoing Cresp, he notes that perfumers have been able to ramp up the dosage of Hedione in formulas over time. It was with *Murmure* (Van Cleef and Arpels) that a level of 20% was reached, adding bloom to the jasminelike scent: "It's the light of my fragrance."

In *L'Eau d'Issey* (Issey Miyake) for women, Cavallier used Hedione to support the fragrance's ozonic character. "The ozonic part isn't too marine and serves the floralcy, thanks to Hedione," he says. "*L'Eau d'Issey* is a floral fragrance and you have a combination of tuberose and peony." The addition of Hedione, he explains, created a bouquet impression, as opposed to a *soliflore* effect.

In the floral-oriental *Jean Paul Gaultier Classique*, Hedione provided

Cavallier volume and diffusivity. "I used a large proportion of Hedione in combination with Hedione HC," he says, referring to Hedione's high *cis* isomer (80:20 *cis* to *trans* ratio), which is distinctly floral and petal-like.^b "It gave all the volume to the floral part. The red floral part was a bit crude—the Hedione made it acceptable for consumers."

"*ckOne* (Calvin Klein) was the first time I used Hedione and Hedione HC," says Morillas. "I mixed them together and I think people understood immediately because you had the memorable freshness of the Hedione and floralcy of the green tea."

^bHedione HC is a trademark of Firmenich.

Morillas' formula for *Acqua Di Gio* (Giorgio Armani) contained 25% Hedione, combined with Hedione HC to boost the aquatic accord. "When I mixed them together with the bergamot-citrus part and aquatic (Calone) side you had the effect of summer time.^c When you smell *Acqua Di Gio* you think immediately 'summer time.'"

"Hedione is in my DNA," says Cresp, whose formula for Dolce & Gabbana *Light Blue* blended lemon with 20% Hedione. "Hedione has a hedonic facet that makes the perfume more beautiful, more masculine or feminine. If you use half a percent, you notice it. At 2% or 3% there's a modern floralcy. The modernity comes from the architecture. Twenty or 30 years ago we were a little bit shy to use Hedione. In feminine fragrances I use up to 40% or 50% in my formula. For men's [fragrances] you can go up to 8–12%, easily. Hedione blends very well with jasmine, tuberose, white flowers, lemon and bergamot."

Cresp's formula for *L'Eau par Kenzo* for women drew its sparkling effect from 40% of Hedione and its watery facet from 1% of Calone. As with Hedione, when smelled on blotter Calone has an understated impression, but in formulations, says Cresp, "It really moves your perfume." And, just as with Hedione, Calone (discovered in 1951) was initially used in sparing doses of 5 parts in 1,000 at 10% dilution. "Now they use it at 1–3% in pure form," Cresp says.

Today, Cavallier regularly experiments with Hedione doses of 5%, 15%, 20% and even 50% to see how compositions respond and how the other elements combine. Meanwhile, the advent of the transparency trend in fine fragrances in the late 1980s made Hedione ubiquitous and thus affordable for consumer product categories. Recently, Cavallier experimented with a "slight" dose of Hedione in a foam bath application, producing a fresh effect. He notes that the material has broad applicability in detergents, shampoos and other products in which it can push tropical notes such as mango, impart freshness, boost substantivity and increase volume.

Beyond Hedione

Hedione represents the first in a series of related materials that have contributed to classic and contemporary perfumery. As mentioned, Hedione's discovery was eventually followed by the high *cis* Hedione HC, which Cavallier describes as "velvet." In combination, he considers a perfect Hedione and Hedione HC dosage ratio to be 20% to 10%.

"Hedione HC is much fresher, greener and stronger" compared to Hedione, says Cresp. "I like to use both of them 50:50—10% of Hedione and 10% of Hedione HC, based on 1,000 parts. On one side you have femininity and floralcy coming from the Hedione and on the other side you have some green freshness and pungency [from Hedione HC]."

The next evolution in this series of aroma molecules is the captive Paradisone, which is more *cis*-jasminelike than

its predecessors, according to Cresp.^d "It's more lactonic and fatty and less floral and jasmine. With Paradisone you get the purity. It's very strong, diffusive and citrusy." Featuring the same sparkling effect as lemon, Cresp typically formulates 4–5% in fragrances. In some cases he has created scents featuring Hedione, Hedione HC and Paradisone. "I relate the three together," he says. "It's like a chain."

If Hedione is, as Cresp says, a "diamond with 57 facets," the more recently discovered Delphone and Veloutone are more singular.^e

"You use Delphone in a small amount, but it gives a jasmine impression with a celery note," says Cavallier. The perfumer has often formulated using Hedione, the jasmine-lactonic-fruity Veloutone and floral-jasmine-celery seed-lactonic Delphone together to achieve a petal-like effect. "To push scents more jasminelike, you add more Delphone," he says. "If you want the fruitiness of gardenia or tuberose you use more Veloutone."

While Cresp might use as much as 40% of Hedione in a formula, he would likely use just 15–20% Veloutone due to its strong fruity-fattiness: "A few drops make a perfume nicer."

The Role of Perfumers in R&D

Firmenich reinvests 10% of its annual turnover into its R&D activities, including 250 chemists working in aroma chemical discovery. Of the ~2,000 molecules discovered by researchers every year, only five to seven will make it onto the perfumers' palette. Bridging the science and creative sides is master perfumer Pierre-Alain Blanc, who brings Geneva's discoveries to the company's senior creative staff for assessment and feedback.

"All of my perfumes have a new, modern molecule inside," says Morillas. "We are in contact with R&D almost every week. If you take jasmine, it smells marvelous. But if you don't add Hedione or Hedione HC [to it], your jasmine still smells very old fashioned. If you take vetiver and add a new molecule, such as Norlimbanol, it becomes very modern.^f With the new molecules you create the new generation of perfumes. If you compare *Acqua Di Gio* to *Eau Sauvage*, *Acqua Di Gio* smells fresh, nice. With its new aquatic notes it changed immediately. It became sunny and fresh. If you take the aquatic note out of *Acqua Di Gio*, you have a traditional fresh cologne. It's nice, but it's not enough."

"All of these syntheses are masterpieces," says Cavallier, who considers perfumers the "ambassadors" of R&D. "We owe [R&D] a lot. Great molecules have given us great perfumes. Today, nothing is impossible—the future is already now."

^dParadisone is a trademark of Firmenich.

^eDelphone and Veloutone are trademarks of Firmenich.

^fNorlimbanol is a trademark of Firmenich.

^cCalone is a trademark of Firmenich.