

# ARGISIL C

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L-arginate of monomethylsilanetriol

INCI name : Silanetriol arginate

## Chemical family

**ARGISIL C** is a SILANOL. Silanols are derivatives of organic silicon, hydrosoluble, with numerous hydroxyl functions and synthesized by reaction on various radicals, selected to confer stability and specificity to the compound. All silanols are endowed with some particular biological properties, and some of these properties are amplified by the nature of the radicals. In the case of **ARGISIL C**, the radical selected is L-arginine.

## Analytical composition

L-arginine	0.56 %
Methylsilanetriol	0.30 %
in which silicon represents	0.9 %
water sq	100.00 %

## Technical characteristics

Very slightly opalescent liquid, colorless  
pH : about 5.5  
Density at 20°C : about 1.0  
Miscible with water, alcohols and glycols.

## Availability

5, 30 or 60 kg drums

## Uses

Lipolysis, anti cellulite : body slimming

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Remodeling / Face «lifting»

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Puffy eyes

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Anti-aging : preventing and repairing effects

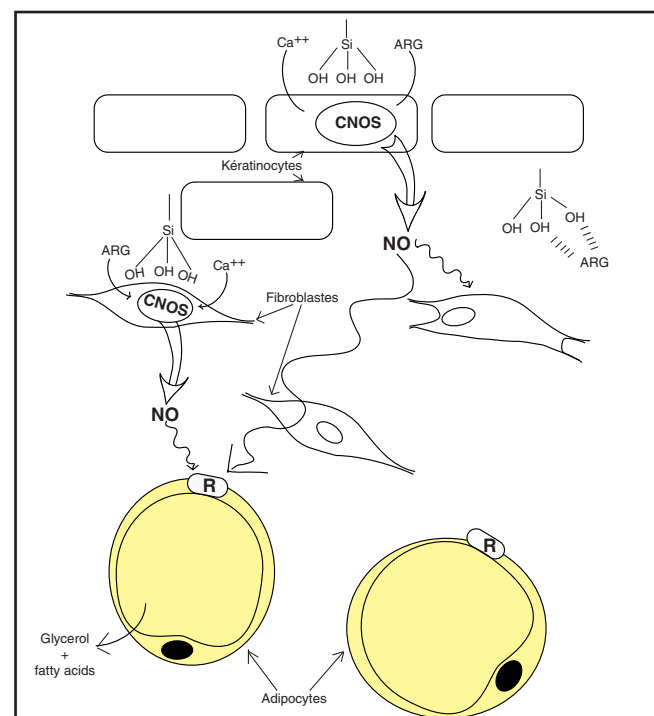
# BIOLOGICAL ACTIVITIES

## Lipolysis - Anti cellulite effect / Cell communication

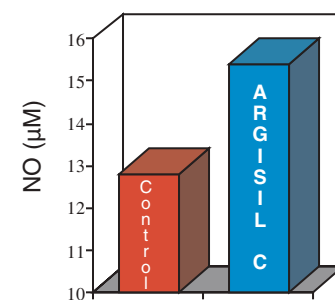
The regulation mechanisms of adipocyte metabolism are better and better understood, and this understanding leads to a wide variety of slimming products (blocking of glucose captation, inhibition of lipoprotein lipase, use of activators or inhibitors of the adrenergic receptors, ...). Several endogenous messengers, involved in **cell communication**, and capable of modulating lipolysis or the stocking of fat in the adipocytes, have also been identified. These substances, of multiple mode of action, are part of a complex system of regulation.

Recent works revealed the involvement in the metabolism of the adipocytes of a particular biological mediator: **nitric oxide** (NO). It has been showed that the adipose tissue produces important quantities of this cell messenger due to the presence in the adipocytes of a specific enzyme, the NO synthase. Besides, keratinocytes and fibroblasts have a particular form of NO-synthase, said "constitutive", capable of producing for a short period, slight quantities of NO.

**ARGISIL C** is capable of **stimulating the secretion of NO**, endogenous messenger, from the cells of upper layer epidermis (keratinocytes) and from the fibroblasts. Nitric oxide (or a migrating species relay of NO with a higher life time) produced in very tiny quantities by the cells of the connective tissue, activates lipolysis (release of glycerol and fatty acids by the adipocytes) through specific receptors localized in the membrane of adipocytes.



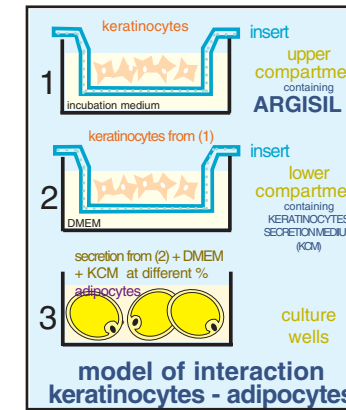
The quantity of NO released in the fibroblasts culture medium, was measured by spectrophotometric titration of the nitrites based on the Griess' reaction.



A significant amount of NO is found in the control fibroblasts culture medium, while a greater but moderate amount, is found when fibroblasts are cultured in presence of **ARGISIL C**.

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## Induction of an endogenous lipolytic messenger : NO



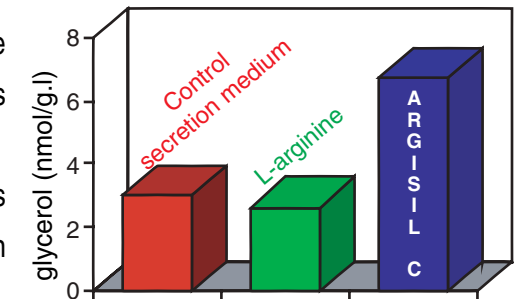
The experimental bicompartiment cell culture model, designed in our laboratories, was used to demonstrate that cells, such as keratinocytes or fibroblasts, stimulated by **ARGISIL C**, could modify the lipolytic activity of adipocytes.

Keratinocytes (or fibroblasts), placed in an insert system, are cultured in presence of the active. The substances secreted by the cells (conditioned medium) are then collected and tested on target adipocytes cells.

The properties of **ARGISIL C** on cell communication were assessed between derm cells (fibroblasts) and hypoderm cells (adipocytes).

In our bicompartiment model, the insert contains the fibroblasts (WI38 line), and the secretions of these fibroblasts are tested on adipocytes in situation of basal lipolysis.

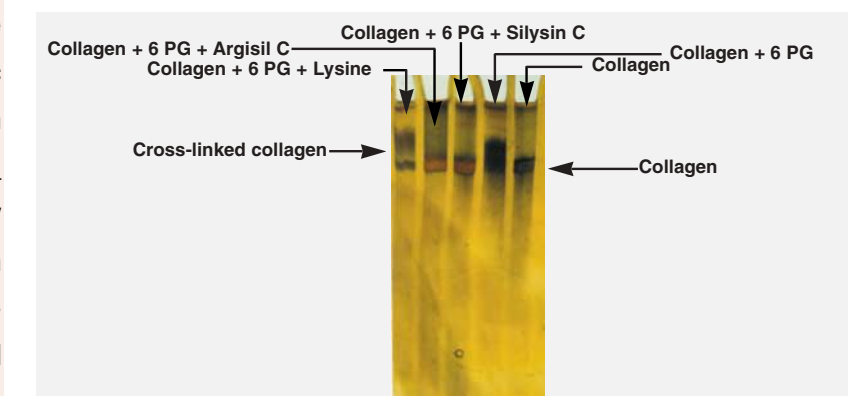
We observed that the substances, secreted by the fibroblasts stimulated with **ARGISIL C**, induce a strong lipolytic response. Straight L-arginine does not induce any significant response, demonstrating that a supply of the substrate of the NO-synthase (the L-arginine naturally present in the skin) cannot by itself generate an endogenous signal.



## Anti-glycation effect

The glycation phenomenon (non enzymatic reaction of a sugar with proteins) is widely spread and induces in all cases protein alterations (irreversible cross-linking). Note that cataract is a consequence of the cross-linking of the crystalline proteins, especially on diabetic people, as well as the Maillard reaction in «gastronomical chemistry» (browning and hardening of the meat). Then finally the aging and loss of elasticity of the skin arises as a consequence of the cross-linking of proteins such as collagen and elastin.

The anti-glycation activity of **ARGISIL C** was substantiated *in vitro* by submitting collagen, as the target protein, to glucose-6-phosphate, the glycation agent. The SDS PAGE electrophoresis, performed after 3 weeks of incubation, revealed that Argisil C was capable of protecting collagen.



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## Tolerance study

The tolerance has been studied *in vitro* by alternative methods either on cell culture or reconstituted epidermis. The ocular tolerance is evaluated by studying the cytotoxicity on fibroblasts culture isolated from rabbit cornea. The cutaneous tolerance is evaluated on reconstituted epidermis by evaluation of cell viability after a contact period of 24 hours with the product. The results observed indicate that :

- ARGISIL C is **non irritant** according to the protocol of ocular irritation,
- ARGISIL C is **non irritant** according to the protocol of primary cutaneous irritation,
- ARGISIL C is not **phototoxic**.

## Formulation

ARGISIL C is stable for pH included between 4 and 8. The suggested use level is of 5 %. The product has no incompatibilities of common knowledge.

Important remark : ARGISIL C must not be stored at temperature inferior to 0°C otherwise an irreversible polymerization occurs.

## Informations : specialized literature



### AMINCISSANT UN NOUVEAU CONCEPT

■ **L'innovation en matière d'amincissement n'est pas chose facile.** En effet, le fonctionnement des adipocytes (les cellules de stockage des graisses) est de mieux en mieux connu et les actifs amincissants s'appuyant sur cette connaissance sont nombreux \*. Cependant, il restait une voie encore inexplorée : celle de la communication cellulaire. Les chercheurs d'Exsymol ont donc étudié l'existence d'un messager produit par les kératino-cytes, les cellules de l'épiderme, et destiné aux adipocytes situés très en profondeur, sous le derme, dans l'hypoderme. Ce messager, c'est une équipe de l'Inserm qui l'a identifié : il s'agit du monoxyde d'azote (NO). Restait aux chercheurs d'Exsymol à trouver une

substance capable d'activer la production de NO par les cellules épidermiques. C'est aujourd'hui chose faite avec l'Argisil C, une association de silanol (dérivé de silicium) et d'arginine (acide aminé). Pour démontrer l'aptitude de l'Argisil C, l'équipe du laboratoire d'Exsymol a également mis au point un test d'évaluation original, et une série de tests montrant que l'activation de la production de NO n'a pas de fâcheuses répercussions (en particulier par la production de radicaux libres).

\* Les actifs amincissants bloquent l'entrée du glucose, qui ainsi ne se transforme pas en graisse, stimulent le déstockage du gras ou trompent les récepteurs cellulaires des hormones qui commandent la formation des graisses...

### Existing studies

(Available upon request)

Technical document

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Cell communication - Induction of an endogenous lipolytic message by ARGISIL C

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Toxicity - Tolerances

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