



Next Generation Food Supplements

Our Core-Business

bioXtract is a B to B/private label developer and manufacturer of innovative **food supplements** or **active ingredients** for pharmaceutical and food supplement industries for Belgian and export Markets.

These active ingredients are presented in the form of **formulated extracts** that can be used as ingredients for the manufacture of food supplements, but also as **ready-to-use finished dosage forms** in private label (capsules or tablets, in bulk or in blister and complete packaging under our customers' brand).

The elaborate extracts are **standardized** in natural active ingredients rigorously selected for their activities in **specific pathologies** (arthritis, metabolic syndrome, allergic rhinitis, IBS and gastrointestinal disorders, inflammatory diseases ...).

Based on his know-how in the field of quality systems, industrial scale-up and registration processes, **bioXtract** design food supplements or active formulated ingredients from the selection of raw materials until the industrial manufacture of finished products.

Our Quality

The logistic/manufacture facility of **bioXtract** is **registered and approved by the AFSCA** (Federal Agency for the Food Chain Safety) for food supplement production under the Registration Number AER/NAM/004889 since 2006.

bioXtract disposes of a validated **Self-Inspection System** (SIS) which ensures the respect of requirements linked to the food safety.

bioXtract is **FSSC22000 certified**, which is a certification scheme for food safety systems including ISO 22000:2005, ISO 22002-1:2009 and additional FSSC 22000 requirements

bioXtract is **GMP certified** according to NSF/ANSI Standard 173, Section 8 dedicated to dietary supplements for both our laboratory and logistic/manufacture premises.

A global Quality Manual is available upon request for more complete information

Our Products

bioXtract has acquired a particular know-how of over 10 years in the development and management of products based on the active ingredient "**curcumin**" and is the leader in Belgium for this asset, having developed several innovative and highly bioavailable curcumin formulations (patented).

Finished dosage form (capsules):

- **Arantal®** a remedy for chronic treatment of **osteoarthritis** and **inflammatory diseases**
- **Nasaler®** a natural remedy for the symptoms of **allergic rhinitis**, offering symptomatic relief with long term immunomodulating activity
- **Rifencin®** a natural remedy for the relief of gastrointestinal disorders like Irritable **Bowel Disease (IBD)** or **Irritable Bowel Syndrome (IBS)**

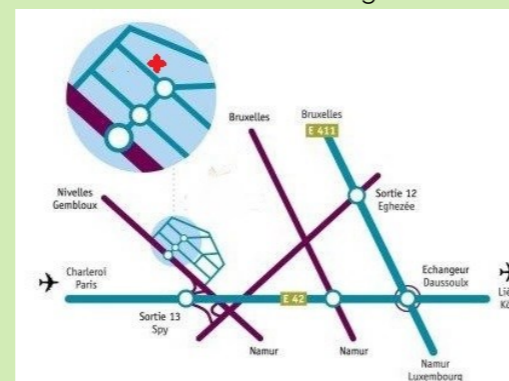
Bulk ingredient:

Cursor®, a pre-formulated powdered ingredient for the manufacture of food supplements with **anti-inflammatory actions**.

bioXtract's innovative range of dietary supplements also includes:

- **Regulid Plus** acting on the **weight stabilization** in yo-yo dieting syndrome as well as on blood HDL and triglyceride level management, acting as a natural treatment of the **metabolic syndrome**
- **Cognityl**, associating theobromin from cocoa and cafein from tea for **concentration and mental energy**

Both are available in the form of bulk formulated ingredient or in the form of finished dosage forms.



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CURSOL MOST SOLUBLE CURCUMIN INGREDIENT

Innovative Formulation

- ✓ Best Source of Soluble Powder Curcumin on the market
- ✓ Precise Standardization of the Active Ingredient
- ✓ Patented Formulation
- ✓ Designed for all Pathologies Involving Inflammatory Processes
- ✓ Possibility of combining or adding other Ingredients
- ✓ Suitable for a Chronic Use
- ✓ Once-a-day Formulations workable
- ✓ Safe Formulation-no Side Effects



CURSOL®

Curcumin - A Natural and Safe Anti-inflammatory Alternative

Curcumin is the best characterized anti-inflammatory agent extracted from the root of *Curcuma longa* L. (turmeric). It is one of the most commonly used spices in Indian, Chinese and Middle-Eastern cuisine. Curcumin possesses potent anti-oxidative, anti-septic and anti-cancer and anti-Alzheimer properties. It has long been used as an anti-inflammatory treatment in traditional Chinese and Ayurvedic medicine¹.

Curcumin has been shown to inhibit activation of the c-Jun N-terminal kinase (JNK) pathway and expression of NFκB, thereby downregulating the proinflammatory responses. Curcumin inhibits the phosphorylation of protein IκB kinase (IKK), thereby inhibiting NFκB translocation to the nucleus. Significant de-

creases in TNF-α, interleukin-1 β (IL-1β), IL-6, and cyclooxygenase-2 gene expression have also been noted with curcumin treatment^{2,3,4,5}.

The available data from *in vitro* and *in vivo* studies suggest that curcumin may be a beneficial complementary treatment for osteoarthritis in humans and companion animals.

However it has been highlighted that more basic research would be required to improve the absorption and

bioavailability of curcumin, and to gain additional information about its efficacy in different species. Currently available data shows poor bioavailability and little *in vivo* data exists to demonstrate efficacy.

Curcumin has an excellent safety profile. An upper level of toxicity has not been established; studies have shown that a dosage as high as 12 g/day is safe and tolerable to humans with only a few mild side-effects reported.



CURSOL® a Powerful Anti-Inflammatory Ingre-

CURSOL® is a patented active ingredient offering highly soluble curcumin with powerful anti-inflammatory action.

CURSOL® is particularly designed for all pathologies involving inflammatory processes. Its highly free flowing powder form allows any possible mixture with other active ingredients for targeting a selected pathology.

There is a real need for natural and side-effects free anti-inflammatory ingredients with high security of use and level of activity. Numerous anti-inflammatory drugs present a lot of side-effects and cannot be administrated for a chronic use.

Preclinical Evaluation of CURSOL® Toxicity

CURSOL® has been tested for acute oral toxicity. This test has been realized by PHYCHER Laboratories (France). The LD50 of **CURSOL®** is higher than 5,000 mg/kg body weight by oral route in the rat. In accordance with the European Regulations, **CURSOL®** must not be classified. No signal word or hazard statement is required.

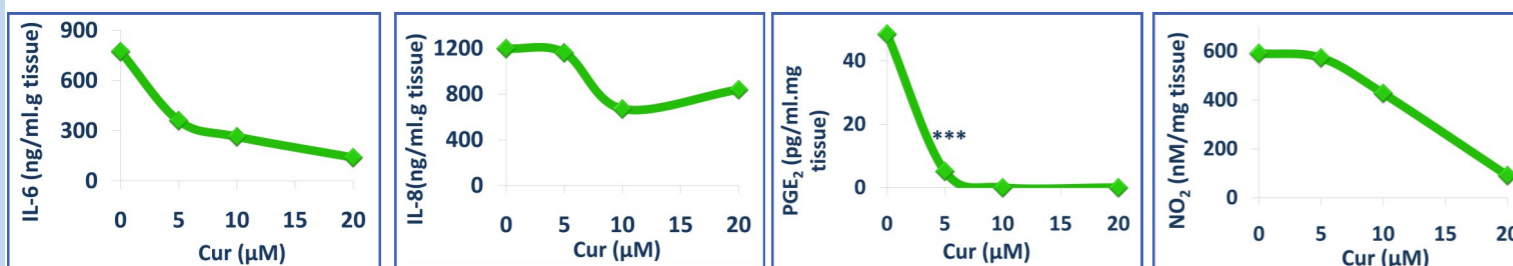
Complete report available on request.

Preclinical Evaluation of CURSOL® Efficacy

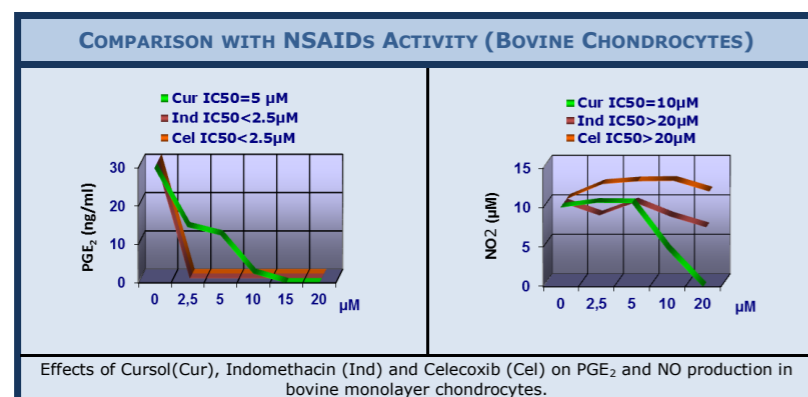
The activity and efficacy of **CURSOL®** formulated curcumin has been tested in vitro for its activity on chondrocytes and cartilage inflammation. The results of this study, run in collaboration with the "Bone and Cartilage Research Unit" (Belgium), under the Direction of Pr Yves Henrotin, have been published in Inflammation Research⁶.

CURSOL® activity and efficacy have been evaluated on three models, rigorously selected as predicting models for efficacy in humans : human and bovine chondrocytes, human chondrocytes in alginate beads and human cartilage explants.

The trials confirmed the anti-inflammatory action of **CURSOL®** as well as its chondroprotective activity, making it the best natural ingredient for pain relief in osteoarthritis.



We have also compared the effects of **CURSOL®** formulated curcumin on PGE₂ and NO production with those of **Indomethacin** and **Celecoxib**. As expected, NSAIDs were more efficient inhibitors of PGE₂ production by chondrocytes than **CURSOL®**. In contrary to NSAIDs, **CURSOL®** also inhibited NO production. This suggests that Curcumin is not only a PGE₂ inhibitor, but also an inhibitor of factors contributing to cartilage degradation and inflammatory cell recruitment.



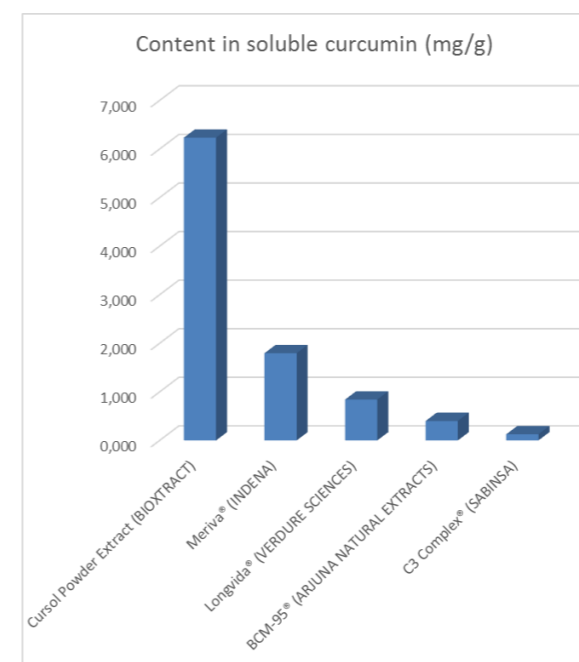
CURSOL® versus other Curcumin Ingredients

Compared solubility of curcumin

Currently, the most widespread, said-to-be bioavailable and documented curcumin powder ingredients on the market are **MERIVA®** from the company Indena (Italy), **BCM-95®** from the company Arjuna Natural Extracts (India), **Curcumin C³ complex®** from the company Sabinsa (USA) and **Longvida®** from the company Verdure Sciences (USA).

As the solubility of the curcumin is the main issue for its bioavailability, and as it is very difficult to compare between them the pharmacokinetics studies on humans of marketed products due to their huge differences in protocols and conditions, it was decided to compare the solubility of the **CURSOL®** to the major curcumin formulations available on the market in the same conditions.

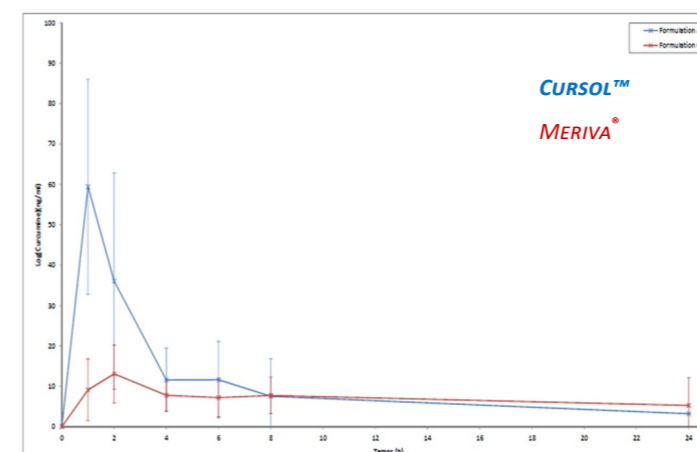
For **CURSOL®**, the solubility test shows that 29.68% of the curcumin present in the product is soluble. For **MERIVA®**, which is the most soluble competitor, the solubility test shows that only 0.97% of the pure curcumin present in the product is soluble.



Curcumin Formulation (Active Ingredient)	Content in Curcumin (mg/g)	Content in Soluble Curcumin (mg/g)
Cursol® (BIOEXTRACT)	21	6,233
Meriva® (INDENA)	185	1,795
Longvida® (VERDURE SCIENCES)	200	0,840
BCM-95® (ARJUNA NATURAL EXTRACTS)	800	0,400
C3 Complex® (SABINSA)	700	0,126

Compared bioavailability of curcumin

Since **MERIVA®** is the most soluble competitor, we decided to perform a compared bioavailability study on humans with this extract.



➔ Higher Curcumin assimilation with **CURSOL®**

Formulation 50% more bioavailable than **MERIVA®**.

The relative absorption of curcumin with **CURSOL®** is 12 times higher than with **MERIVA®**.

➔ Faster action with **CURSOL®** : 2 times faster

Tmax **CURSOL®** < 1h Tmax **MERIVA®** : 2-3h

➔ Maximal plasma concentration 4.5 times higher with **CURSOL®** which leads to a higher level of efficacy.