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Letter to the Editor

Avocado/soybean unsaponifiables, ASU EXPANSCIENCE™, are strictly different from the nutraceutical products claiming ASU appellation

Laboratoires EXPANSCIENCE have discovered, developed and produced a pharmaceutical product, PIASCLEDINE® 300, which is effective for the "symptomatic, delayed-effect treatment of arthrosis of the hip and knee" (wording from the MA indication). The active principle of this pharmaceutical product is called ASU EXPANSCIENCE™ and is composed of a mixture of soybean unsaponifiables and specific avocado unsaponifiables. The specificities of the product and elements of the process are protected by patents.

Recently, Au RY *et al.* have demonstrated that a so called ASU extract, named ASU-NMX 1000TM (Nutramax Laboratories Inc, Edgewood, MD, USA), suppressed tumour necrosis factor (TNF)-α, IL-1β, cyclooxygenase (COX)-2 and iNOS gene expression, and PGE_2 and nitric oxide production in articular chondrocytes and monocyte/macrophages[1]. In the introduction, following a brief point on arthrosis, the mediators involved and the usual treatments (NSAIDs) prescribed for treating this pathology, the authors propose the use of avocado and soybean unsaponifiables (ASU) as an alternative or additional therapeutic approach. To make their case, the authors list and describe several clinical, animal and *in vitro* studies demonstrating the pharmacological and clinical efficacy of ASU.

We must draw your attention to the fact that the ASU used and tested in all of the studies referred to in the text are strictly original and unique ASU EXPANSCIENCE™ – active ingredient of the patented pharmaceutical product PIASCLEDINE® 300 from Laboratoires EXPANSCIENCE and there is no existing alternative on the market. For many years, mainly in Europe but also in other parts of the world, the action of ASU EXPANSCIENCE™ in the symptomatic treatment of arthrosis has been recognised through the pioneering, original investment of Laboratoires EXPANSCIENCE.

In the following sections of the text, the authors describe and discuss *in vitro* studies aiming to demonstrate the biological activity of ASU-NMX1000 (NUTRAMAX Laboratories), which have nothing in common structurally with ASU EXPANSCIENCE™, except for the general label ASU.

As such, scientifically speaking, these results cannot under any circumstances be put into perspective or combined with the data that have been published by our pharmaceutical company and the related research teams on ASU EXPANSCIENCE™ for nearly 20 years[2–10].

To give the scientific community appropriate clarification on these structural differences, we can say that "the originality of PIASCLEDINE® 300 is based on the *A/S* ratio (1:2) and specific composition of both unsaponifiables. The main components of these unsaponifiables are tocopherols, sterols and specific molecules from avocado obtained by proprietary and particular patented process"[11–13]. Such avocado unsaponifiable (AU) is quite different from common, natural AU. The active substance, ASU EXPANSCIENCE™, is obtained in the pharmaceutical quality context by controlling all in-process steps and the traceability of the entire production chain.

We have also studied three NUTRAMAX commercial products containing ASU-NMX 100:

- DASUQUIN with MSM;
- DASUQUIN; and
- AVOCA ASU,

in comparison with our ASU EXPANSCIENCE™. The results of the study were presented at the poster session of the last OARSI World Congress on Osteoarthritis 2007 in Fort Lauderdale[14].

In order to characterise each product chemically, we have used different analytical methods that have been validated according to ICH Q2R1 guidelines:

- gas chromatography;
- UV spectrometry;
- unsaponifiable content determined by "the American Oil Chemistry Society N° Ca 6a-40" method; and
- a mathematical approach to the analytical data has been performed by Normalised Principal Component Analysis (nPCA)[14].

The analysis of data significantly demonstrated that the commercial nutraceutical products from NUTRAMAX claiming the ASU label are totally different from the common and natural sterol based avocado and soybean unsaponifiables and also from ASU EXPANSCIENCE™ (PIASCLEDINE® 300) (Tables I and II):

1. Absence of or no detectable specific molecules from common natural avocado unsaponifiables like the key molecule, citrostadienol;
2. Absence of patented molecules from Laboratoires EXPANSCIENCE;

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Table I
Content of each fraction evaluated by chromatographic analyses

Content in %w/w	EXPANSCIENCE patented molecules	Tocopherols (alpha-tocopherol, delta-tocopherol, gamma-tocopherol)	Sterols (brassicasterol, campesterol, stigmasterol, beta-sitosterol, citrostadienol)	Proportion of brassicasterol* in the phytosterols pool	Proportion of citrostadienol† in the phytosterols pool
ASU EXPANSCIENCE™	>10	>10	>15	Not detected	Presence
DASUQUIN with MSM − NUTRAMAX (DASU MSM NUTR)	Not detected	0.1	28.2	1.4%	Not detected
DASUQUIN − NUTRAMAX (DASU NUTR)	Not detected	0.5	30.0	1.3%	Not detected
AVOCA ASU − NUTRAMAX (AVOCA ASU NUTR)	Not detected	1.0	49.9	1.4%	Not detected

*Rapeseed oil or related unsaponifiables imprint.
†Avocado unsaponifiable imprint.

Table II
Analysis of the differences in composition

	ASU EXPANSCIENCE™ (PIASCLEDINE® 300)	NUTRAMAX commercial nutraceutical products
Patented molecules	Yes	No
Tocopherols	Yes	Yes but divided by 25−50
Sterols		
From soybean	Yes	Yes
From avocado	Yes	No (citrostadienol absent or non detectable)
From rapeseed	No	Yes (presence of brassicasterol)
ASU as conclusion	Yes 100%	No (NUTRAMAX commercial nutraceutical products presented as unsaponifiables are mainly composed of soybean and rapeseed sterols)

3. Presence of brassicasterol, which is highly specific for rapeseed oil and related unsaponifiables;
4. Very low tocopherols content: it demonstrates that the compositions of NUTRAMAX commercial nutraceutical products do not correspond to real soybean oil unsaponifiables; and
5. The specific proportion of ASU EXPANSCIENCE™ (1:2) is not maintained.

In conclusion, we would like to remind scientists and rheumatologists of the risk of confusion arising from the commercial or scientific use of the acronym ASU with no chemical basis, the unauthorised use of scientific property, and the abused backing of ASU EXPANSCIENCE™ (PIASCLEDINE® 300). The specific composition of ASU EXPANSCIENCE™ (PIASCLEDINE® 300) is associated with the widely demonstrated *in vitro* and *in vivo* clinical activities allowing the recommendation of the original, authentic and pharmaceutical ASU EXPANSCIENCE™ in the management of osteoarthritis[2−10,15].

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