

# The “Fish DNA” Fantasy and the Fishy Story of Cell Therapy: Myths and Frauds in Spa-Wellness and Internet Food Supplements

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## ABSTRACT

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## Editorial

In the last 2 decades or so we are observing an ever growing hazy field of “antiaging”, where tons of non-validated supplements and techniques are smuggled and termed as innovative, regenerative, expanding life-span, improving quality of life, detox, whatever this scientifically-obscure terminology means especially in spa and pampering wellness medicine, often designed and run by individuals devoid of any long-trained, university-validated qualifications in science and/or in medical management. In Japan, Canada and Australia there are a number of regulatory clauses putting some quality barriers to food supplements allowing a certain degree of health claims. Scientists in time studied and defined a series of foods and nutrients which were officially listed in the category “foods to be specifically administered for health-care” (Food for Specified Health Use, FOSHU) [1] stressing and recognising their nutritional value, after undergoing a consistent bio-fermentation process. Such a classification still is a legally binding tool against media communication of wrongly defined natural products, misleading or simply generally recycling generic data in literature but not based on specific validations of the given product itself. We, in Japan have also a definite and solid category of food supplement classified as Wakan-Yaku (Natural Drugs)

with its own officially recognised medical journal [2]. This label-certification requires a bulky and expensive dossier endowed with *in vitro*, *in vivo* experimental and clinical studies.

However, in other countries such stringent criteria are simply not-existing and this “vacuum legis” allows the money-propelled marketing to promote whatever is not too blatantly toxic under dreamy pseudo-scientific claims. In such de-regulated setting, DNA and stem cells have been infamously used either to bombast risky DNA- or stem cell-therapies per se or, much more modestly, just naively named to promote not more than average quality oral supplements with wanna-be panacea effects [3,4].

In the quest of searching new glamour messages rather than solid proves, marine biology has recently represented another hoped Eldorado for a number of compounds hilariously promoted as “fish DNA” [5], trying to lure the unexperienced reader or the money-rewarded prescribing physicians. The latter practice is allowed in USA and few other countries but judged as immoral and prosecuted by law in all Europe, Japan for example. As a matter of fact, such fish squashes (simple protein hydrolysate or fish eggs extracts) have an often outrageous price of hundreds of USD (needed to maintain the promo-boosting and propelling the

prescription-rewarding machinery) whereas on the bench they are worth around few USD, no matter how luxurious the outer box or vase may look like.

In such cases of oral marine biology supplements, the terminology “cell therapy” is a tricky and scientific unrealistic leit motif to confuse the audience. As a matter of fact, “real” cell therapy holds great therapeutic promises, but it has also generated a great deal of controversy as for the source of the cells like when using embryonic stem cells. Moreover, the “real” Cell Therapy still suffers of a number of complex methodological issues such as transporting cells and cell component together representing a manufacturing bottleneck for biotech companies. This is to say that the “fishy” claim of some greedy-commercial marine biology supplement to exert a “Cell Therapy” health rejuvenation effect is nothing more than a mere fantasy bordering a communication fraud.

In this regard, the FDA Health Communication Scam document states as follows: “Health fraud scams refer to products that claim to prevent, treat, or cure diseases or other health conditions, but are not proven safe and effective for those uses. Health fraud scams waste money and can lead to delays in getting proper diagnosis and treatment. They can also cause serious or even fatal injuries. “[6] Such manufacturers are very sneaky in that they put generic health claims on their boxes or printed material registered in a given country where they market the product but then they locate their salvific overclaims on powerfully driven websites located in countries with rather generous control where terminologies such as “uring, reversing aging process, improve sexual performance or chronic disease control may be laid over an attracting silver tray, albeit often very expensive. Equally outrageous is the commercial terminology of “fish DNA”, for its inner nonsense in terms of any claimed efficacy per se like alluding a peculiar potency of fish DNA, to cross undigested our gut barrier and magically potentiate-modify our own genome and disease epigenetic mechanisms. Moreover, the absurdity of this terminology has to be taken into careful attention when considering that institutions from a survey on fish DNA technologies survey across 30 countries, it appeared that in all 57 compliance investigations identified, the costs of DNA analysis were found to be less than the value of the confiscations or fines imposed for infringements. The EU’s Common Fisheries Policy set of rules [7] to ensure that fishing and aquaculture are environmentally and socially sustainable and that they provide a source of healthy food for citizens. Indeed, based on the above results and in line with Article 13 (“new technologies”) of the EU Common Fisheries Policy Control Regulation, the study pointed out the need of control and enforcement agencies to apply more routinely the use of DNA analysis techniques (namely ‘Next generation sequencing’ technology analysis) without which any fish supplement may contain a variety of undeclared marine products [8]. Further risks of wild marketing of marine biology supplements may be related to what pointed out by FAO in 2018 [9]. This publication pointed out the serious consequences of fraud for the fish and fish-derived

area that can take place along the fish supply chain, for example: intentional mislabeling, species substitution, overglazing and overbreeding, and the use of undeclared water-binding agents to increase weight.

Caviar is a further commercial glamorous factor permeating beauty cosmetics and also food supplement market where its lure for power, libido, richness and longevity [10] (none of them ever scientifically proven!) represents its main subliminal attraction. However, also for declared “caviar-based” capsule, some warnings have to be pointed out. Back in 1997, all sturgeon species were included in the Appendices of the Convention on International Trade in Endangered Species. This led to the sturgeon species identification as being a task of paramount importance [1]. For example, the standard for sturgeon caviar [2] adopted in 2010, indicates that caviar is only the product prepared from fish eggs, treated with grade salt, of the Acipenseridae family. Thus, the term “caviar” must be used only for sturgeon eggs and labels should include the common name of the species, such as Beluga for *Huso huso*, Osetra for *Acipenser gueldenstaedtii* etc. Not surprisingly, in caviar-based food supplement this information is blatantly missing [11]. This brings about the suspect that, for commercial gain, it does not contain true caviar, but also or only caviar substitutes obtained from eggs of other fish species or other animal organisms, and a variety of other products called “caviar” that have no trace of fish eggs [12]. Indeed, past excessive overfishing following high marketing food demand and highly luring prices for caviar have led to drastic population decline and dramatic shrinking of fisheries for the Atlantic sturgeon, Gulf sturgeon, lake sturgeon and white sturgeon as well. It is then understandable how come that such salvific fish\*derived food supplements like the one mentioned above, are enveloped by a confounding constellation of registration logos but not any real international patenting seal which they would hardly ever be granted.

Serious evidence-based research in biogerontology trying to unfold the most intimate mechanisms of senescence and their possible counteracting is relentlessly undergoing together with ever advancing canonical preventive medicine strategies which cannot be exerted by spa and health and wellness pampering centers. On the other hand, the short cuts to the Fountain of Youth remains only marketing fantasies, if not cheating or a poisonous apple for unaware Snow White consumers not only at a sky-high cost but maybe even at health risk over medium-long term use. While hypnotizable consumers will always exist, there is also a surging number of them publicly showing a dismaling criticism against such panacea, the above marine biology dreams included [13].

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### Conflict of Interest

No conflict of interest.

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