KAMBO – PEPTIDES

Studies on indigenous tribes using Kambo began in the 1930s. But it was the anthropologist and journalist Peter Gorman who in around 1980 documented his experience with the treatment of Kambo in his article “Making Magic” and, interested in the study of it and the promotion of the registration of the first patents of bioactive peptides, sent samples of the secretion of the Phyllomedusa Bicolour to western universities.

The first bioactive peptide produced by a Phillomedusa was discovered in 1966 and since then, the discoveries of these biopeptides have grown exponentially to the present time. Kambo’s scientific research began in 1980 thanks to the Italian pharmacologist Vittorio Erspamer of the University of Rome. He was nominated twice for the Nobel Prize and is considered to be the first scientist to analyse Kambo in the laboratory concluding that Kambo contains a *“fantastic chemical cocktail with potential medical applications unmatched by any other amphibian.”*

Kambo is administered through small burns in the skin, immediately triggering a variety of beneficial chemical reactions in the human body. Kambo has the ability, unlike many other natural and pharmaceutical substances, to cross the blood-brain barrier and produce its effects also at the level of the brain. Human cells open themselves to the beneficial properties of Kambo unlike many substances that are filtered and eliminated by the body’s highly intelligent defence system. In this chemical cocktail, we find peptides that perform hormone-like tasks, while others provide support for vital cellular processes (learning, memory, metabolism of certain neurotransmitters). Others have a potent effect on the gastrointestinal muscles, gastric and pancreatic secretions, blood circulation and stimulation of the adrenal cortex and pituitary gland and reproductive system, others possess potent analgesic powers. Others are able to inhibit the growth of tumour cells, and antimicrobial, antifungal, antiviral and antiprotozoal peptides are also found. The latter property opens a new door in the fight against bacterial infections that have developed resistance to antibiotics that already exist in the market, using these to apply nanotechnologies to these modern biopeptides.

Since 1966, many peptides in Kambo secretion have been isolated, characterized and synthesized. As a testimony to its medicinal properties there are more than 70 Kambo patents registered in the pharmaceutical world, mainly in the United States.

The main families of bioactive peptides identified in the Kambo secretion so far include:

Phyllomedusin – such as tachykinins (which also act as neuropeptides) – produce contraction at the smooth muscle level and increase secretions of the entire gastrointestinal tract such as the salivary glands, stomach, small and large intestine, pancreas and gallbladder. These are the main parts responsible for the deep purge produced by the administration of Kambo.

Phyllokinin and Phyllomedusins – both are potent vasodilators, increasing the permeability of the blood-brain barrier both for their own access as well as for that of other active peptides. Within this family are the medusins, which also have antimicrobial and antifungal properties.

Caeruleins and Sauvagines – They are peptides with chains of 40 amino acids with myotropic properties on the smooth muscles, producing a contraction of the colon and urinary bladder. They produce a drop in blood pressure accompanied by tachycardia. They stimulate the adrenal cortex and pituitary gland, contributing to greater sensory perception and increased resistance. Both peptides possess a great analgesic power, contributing to the increase of physical strength, the capacity to confront physical pain, stress, disease and diminish the symptoms of fatigue. In the medical field this family of peptides contributes to improved digestion and has analgesic properties against pain in renal colic, pain due to peripheral vascular insufficiency and tumour pain.

Dermorphin and deltorphin – These are small peptides composed of 7 amino acids. They are selective agonists of the opiate delta receptors, 4000 times more potent than morphine and 40 times more than the endogenous endorphins.

Adenoregulins – discovered in the 90s by John Daly's team at the National Institute of Health in the United States. Adenoregulin works on the human body through the adenosine receptors, a fundamental component throughout all human cellular fuel. These receptors may offer a target for the treatment of depression, stroke and cognitive loss diseases, such as Alzheimer's disease and also Parkinson's.

Antimicrobial peptides: Dermaseptins, including adenoregulins (with 33 amino acids), plasticins and phylloseptins form part of a family of a broad spectrum of antimicrobial peptides involved in the defence of frogs' bare skin against microbial invasion. These are the first vertebrate peptides that show lethal effects against filamentous fungi responsible for severe opportunistic infections which accompany the immunodeficiency syndrome and the use of immunosuppressive agents. They also show lethal effects against a broad spectrum of bacteria both large+ and large-, fungi, yeasts and protozoa. Several years of research carried out at the University of Paris have shown that peptides Dermaseptin B2 and B3 are effective in killing certain types of cancer cells. Research at Queens University in Belfast recently won a prestigious award for his ground-breaking work with cancer and Kambo. Its action mechanism is produced by inhibiting the angiogenesis of tumour cells, with selective cytotoxicity for these cells.

Bradykinins – such as phyllokinins and tryptophilins. They are peptides with structure and properties similar to human bradykinin. They are important sources of scientific study as they are hypotensive and due to producing vasodilation, contraction of the non-vascular smooth muscle, increase vascular permeability, also related to the mechanism of inflammatory pain.

Bombesins – these peptides stimulate the secretion of hydrochloric acid by acting on the G cells of the stomach, regardless of the pH of the medium. They also increase pancreatic secretion, intestinal myoelectric activity and smooth muscle contractibility.

Ceruleins – Stimulate gastric, bile and pancreatic secretions, and certain smooth muscle. They could be used in the paralytic ileus and as a diagnostic medium in pancreatic dysfunction.

Tryptophilins – are neuropeptides consisting of 4 to 14 amino acids, which are opening up new perspectives on how the human brain works.
These biopeptides have aroused a great deal of scientific interest and many of them have been successfully synthesized in the laboratory and patented.But so far, none of these molecules have been used in clinical practice. Research on the components of Kambo continues to evolve to find clinical applications in the world of medicine and pharmacology, and in the study of new action mechanisms in our human biology.

For thousands of years, Amazonian tribes have been using and benefiting from this chemical cocktail according to their ancestral traditions, their intuition and their magic. Now it is up to us, above our rational and scientific culture, and accompanied and supported by it, to take advantage of this gift of nature and obtain all its benefits, beyond what we can be demonstrated by the multitude of pharmacological experiments carried out in scientific laboratories.

Rosa Sanchis
Pharmacist.