

Hyaluronan's many roles

Hyaluronic acid, or hyaluronan... Besides being difficult to pronounce, this molecule's diverse functions are difficult to describe!

While genetic overexpression of this molecule in Shar Pei dogs is associated with their characteristic wrinkles, hyaluronan is also responsible for their susceptibility to inflammatory and autoimmune diseases.

On the other hand, people with pets might also be familiar with this compound in relation to promoting health – joint health. For that matter, it has been marketed as a joint supplement for humans as well.



In the Department of Pathobiology, Carol de la Motte, PhD, has been researching hyaluronan for 15 years. She is fascinated by the multiplicity of roles hyaluronan plays – from wound healing to cancer – and how different sizes of its repetitive chain-like structure influences these roles.

Dr. de la Motte has discovered hyaluronan's repertoire extends even further: her laboratory was the first to measure hyaluronan in human breastmilk.

Newborns have no microbiome in their intestines – that is, no gut bacteria (the good kind) to help with digestion and ward off harmful bacteria. The hyaluronan in maternal milk protects the newborn by promoting the growth of helpful bacteria while inhibiting the bacterial “bad guys.”

In fact, Dr. de la Motte's laboratory has discovered that hyaluronan interacts with the infant's intestinal wall to trigger a cascade of events that protects the child from viral and bacterial invasion.

Notably, Dr. de la Motte found that the levels of hyaluronan in maternal milk are at their peak at the earliest stages of the newborn's life – when they need the protection the most – and taper off thereafter, as the infant's intestine is able to establish its own protective gut flora.

In contrast, only negligible amounts of hyaluronan were found in formula.

Funding from the National Institutes of Health /National Institute of Child Health & Human Development is helping to launch this novel investigation of hyaluronan's putative application as a supplement for formula-fed infants or those prone to gastrointestinal infectious disease.